

# Ongoing Monitoring Report (November 2021 – October 2022)

RAAF Base Learmonth

304700525



Prepared for  
Department of Defence

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## Executive Summary

### Introduction

Cardno, now Stantec (Cardno), were engaged by the Australian Department of Defence (“Defence”) to carry out the Per- and Poly-Fluoroalkyl Substances (PFAS) Ongoing Monitoring Plan (OMP)<sup>1</sup> at the Royal Australian Air Force (RAAF) Base Learmonth, Western Australia (WA) (Figure 1, Appendix A).

The Ongoing Monitoring Plan (OMP) outlines the rationale and scope for the monitoring of the concentrations and extent of PFAS in groundwater, seepage water, surface water and sediment originating from the RAAF Base Learmonth, WA (‘the Base’).

The OMP includes sampling and analysis not only from the Base, but also from a number of surrounding (off-Base) waterways. The Base and these surrounding areas are collectively referred to as the ‘Management Area’ and was identified during a Detailed Site Investigation (DSI) in 2018 (GHD, 2018)<sup>2</sup>. The Management Area is shown on Figure 2, Appendix A of this report.

### Objectives

The objective of the OMP is to assess changes in the nature and extent of PFAS within the environment. The OMP used the monitoring network developed as part of the PFAS Management Area Plan (PMAP) to monitor the amount of PFAS leaving the Base through the groundwater and surface water. The PMAP was designed to target areas where there is a potentially elevated risk to a receptor (for example, to people or the environment) associated with Defence’s historical use of legacy aqueous film forming foam (AFFF).

### Monitoring Scope

The November 2021 – October 2022 monitoring period consists of biannual monitoring events (November 2021 and June 2022), as well as a ‘first flush’ monitoring event (May 2022) following the first heavy rainfall of the wet season. A first flush monitoring event is important to measure as it is when PFAS concentrations are typically higher than they would be measured at other times. This is due to the build-up of PFAS over the dry season related to surface water evaporation. The scope of work for the biannual monitoring events comprised monitoring of 49 groundwater wells, six water seepage locations and 49 collocated sediment and surface water locations, as specified in the OMP. The first flush event conducted in May 2022 comprised the monitoring of 49 collocated sediment and surface water locations following the first heavy rainfall of the season.

Groundwater elevation data was collected from 49 groundwater wells during the biannual monitoring events.

Works were conducted in general accordance with the Sampling and Analysis Quality Plan (SAQP, Appendix B) (Cardno, 2022), except as summarised in Section 3.6 of this report.

PFAS concentrations in all media tested generally remained within the same order of magnitude as those measured in previous monitoring rounds. Results from previous monitoring rounds can be found in the 2021 Annual Interpretive Report, as well as the DSI (GHD, 2018).<sup>2</sup>

The current monitoring network is considered adequate to monitor PFAS in groundwater, seepage water, surface water runoff and sediment, and to provide an early detection of significant changes in migration.

#### 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.

<sup>1</sup> The OMP is publically available at <https://www.defence.gov.au/about/locations-property/pfas/pfas-management-sites/raaf-base-learmonth>, and is found as Attachment 1 of the PFAS Management Area Plan

<sup>2</sup> Publically available at <https://www.defence.gov.au/about/locations-property/pfas/pfas-management-sites/raaf-base-learmonth>

## Groundwater Results

### *Groundwater Flow Direction*

The local groundwater flow pattern (GHD, 2018) at the Base was observed to be following the regional flow regime; that is, flowing toward Exmouth Gulf to the east. The groundwater from the Base tends to flow towards an area of groundwater depression between the Base and the coast (Figures 5 and 6, Appendix A). This groundwater depression is naturally occurring due to the surface and subsurface conditions, including a low hydraulic gradient beneath the Base and the tide mechanisms bringing salt water from the Exmouth Gulf inland. This means that water preferentially flows towards the depression. As a result, the area has elevated salinity and there is very little overall flow to the surface waters located to the east. It is noted, however, that groundwater levels in wells near the coast are influenced by the ocean tides.

The results of the OMP monitoring events supported the historical gauging results and groundwater flow directions, with some locations closer to the coast indicating a slight preferential flow to the coast.

### *PFAS Concentrations*

PFAS concentrations in groundwater remained within the same order of magnitude as historical data and didn't display any seasonal variability. That is, there was no notable difference between the concentrations measured in the two biannual sampling events even though they are during different seasons.

With the addition of the November 2021 – October 2022 sampling events, all monitoring wells now have sufficient data to conduct trend analysis to support the interpretation. The results indicated that for the majority of the monitoring wells, stable trends in PFAS concentrations were interpreted. This means there is no increasing or decreasing trend in the PFAS concentrations so there are no changes in our understanding of PFAS movement around the Base.

PFAS concentrations within the on-Base source areas ranged above and below the HEPA (2020) criteria for recreational use (2.0 µg/L). The November 2021 – October 2022 monitoring data remained of the same order of magnitude as historical results at each monitoring well.

The highest PFAS concentrations in groundwater outside of the source areas were reported at on-Base well, MW172, located relatively close to the maintenance area.

The PFAS concentrations for the off-Base pathway and receptor monitoring wells are generally consistent between each November 2021 – October 2022 monitoring events and with historical concentrations. The November 2021 – October 2022 monitoring data generally remained of the same order of magnitude as historical results at each monitoring well except for MW135 in the northern drainage channel, which recorded sum of Per-fluorooctane Sulfonate (PFOS) and Per-fluorohexane Sulfonate (PFHxS) concentrations one order of magnitude greater than the historical maximum concentrations in November 2021. MW135 concentrations were below the laboratory limit of reporting (LOR) in the following monitoring event (June 2022).

The November 2021 – October 2022 groundwater data, supported by gauging records, confirms the current understanding of the risk for the Management Area, which is low and acceptable.

#### **What is a 'limit of reporting'?**

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

## Seepage Water Results

Seepage water is groundwater that is moving to the surface (with groundwater flow and tide effect mechanisms). The monitoring of seepage water provides data to assess the potential risk of PFAS migrating from groundwater to the Exmouth Gulf environment. During this monitoring period, detectable PFOS and sum of PFOS and PFHxS concentrations were reported in one sample, OTH134 (located downgradient of the fuel farm Source Area) in June 2022. The results indicate a new maximum for this location and were one order of magnitude greater than historical results. It is noted that this is not a first-time detection at this location. Considering the detectable concentrations were significantly lower than the adopted recreation criteria and the dilution factor when reaching the Exmouth Gulf, it is considered that the potential risk to human health and environmental receptors remains low and acceptable. However, further monitoring of the PFOS and sum of PFOS and PFHxS concentrations at this location through the continuation of OMP monitoring is warranted.

## Surface Water Results

Overall, the PFAS concentrations at surface water sampling locations are predominantly consistent with historically recorded concentrations, except for one sampling location along the drainage channels (SW265). The relatively elevated rainfall recorded between April 2022 and June 2022 and the first-time surface water flowing through three historically dry locations could have contributed to the increased PFAS mobilisation with surface water.

PFAS concentrations in surface water samples across the receptor area were predominantly below the laboratory LOR during the monitoring period except for four locations within WAPET Creek northern reach (SW210, SW300, SW302, SW303). The PFOS concentrations recorded were within one order of magnitude of the laboratory LOR. These detections exceeded the adopted ecological criteria (LOR adopted as the criteria of 0.00023 µg/L is lower than the LOR). There were no new maximum concentrations or guideline exceedances reported off-Base. Therefore, it is considered that there is no significant change in the understanding of the risk profile of the Management Area.

## Sediment/Surface Soil Results

Sediment (wet samples) and surface soil (dry samples) are sampled to provide an indication regarding the movement of PFAS in the environment. Concentrations recorded during the November 2021 – October 2022 monitoring period were consistent with historical data (i.e. of the same order of magnitude). Some localised new PFOS concentrations (both maximums and minimums) were recorded throughout the monitoring period within the on-Base drainage channels at SS108, SS113, SS124, SS170, SS174, SS176, SS265, SS277, and at the northern drainage channel locations SS192 and SS193. No first-time detections were observed within the central drainage channel.

PFAS concentrations within the receptor area were predominantly above the laboratory LOR except for one location in the northern reach of WAPET Creek and three locations in the southern reach of WAPET Creek. The PFAS concentrations detected in the northern reach of WAPET Creek is likely because of wet season flooding events and PFAS dispersion with surface water.

Based on the current available data there is no significant change to the risk profile associated with sediments/surface soils.

## Risk Summary

The evaluation of analytical results suggests the nature and extent of PFAS in groundwater, seepage water, surface water or sediment remains consistent with that reported from previous investigations despite slight fluctuations in PFAS concentrations at individual locations.

The understanding of PFAS source areas presented in the investigation phase (GHD, 2018) is supported by the OMP monitoring data, with the highest PFAS concentrations consistently detected within the two previously identified on-Base source areas (namely the Fuel Farm and the Maintenance Area, refer to Figure 2, Appendix A).

The pathways for PFAS exposure and risks to human health (such as recreational anglers in the Management Area) and ecological receptors (such as land and aquatic flora and fauna) presented in the investigation phase (GHD, 2018) have been reviewed and are still considered to be appropriate and the OMP monitoring data collected to date does not suggest any significant changes to these mechanisms or risks.

Information gathered during the monitoring period supported the conclusion made in earlier investigations, that PFAS poses a low risk to recreational anglers with respect to bioaccumulation in commonly caught fish species, and that PFAS poses a low risk to the commercial prawn fisheries of the Exmouth Gulf Managed Prawn Fishery.

The OMP contains management response triggers, which are concentrations that would trigger an additional assessment and risk analysis to determine if additional management is required. None of the management response triggers were observed in the November 2021 – October 2022 monitoring period. The management trigger for source area groundwater (first-time detections) was observed during the November 2020 – October 2021 monitoring period at four locations; MW102 (Nov-20), MW134 (Nov-20), MW139 (Jun-21) and SW305 (Mar-21). However, these locations reported PFAS concentrations below the LOR in all monitoring events within the November 2021 – October 2022 monitoring period.

The nature and extent of PFAS across all media has not changed from the understanding presented in the investigation phases and the PFAS Management Area Plan (PMAP). Based on the current available data there is no significant change to the risk profile of the Management Area.

## Conclusions

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

- The November 2021 – October 2022 monitoring results met the objective of the OMP and monitoring was carried out in general accordance with the SAQP.
- Overall, the concentrations of PFAS across the media and locations sampled are generally consistent and of the same order of magnitude as historical data.
- The highest PFAS concentrations in groundwater were recorded at the on-Base Source Area 2 - Fuel Farm. However, there is no evidence of PFAS movement towards off-Base sensitive receptors. This is supported by the groundwater levels recorded and inferred groundwater flow direction.
- Above average rainfall amount during the November 2021 – October 2022 monitoring period resulted in more surface water samples collected in comparison with previous years of sampling. However, no new maximum concentrations or guideline exceedances were reported at surface water monitoring locations downstream of the site, targeting the sensitive receptors.
- Mann Kendall statistical analysis indicated that some increasing and decreasing trends were observed at individual monitoring locations targeting the source areas. This indicates the source areas continue to contribute to the PFAS load in groundwater through leaching from impacted soils. However, the impact is also reducing in some locations for Source Area 1 (MW113, MW114 and MW233). Mann Kendall trend analysis outcomes for the pathways and receptor areas indicated that there were potentially stable trends or no statistically significant trends.
- Based on the current available data there is no significant change to the risk profile of the Management Area (low and acceptable).

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## Chemical Names

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

## Technical Terms

|        |                                                                 |
|--------|-----------------------------------------------------------------|
| AFFF   | Aqueous Film-Forming Foam                                       |
| AHD    | Australian Height Datum                                         |
| ANZECC | Australian and New Zealand Environment and Conservation Council |
| AS     | Australian Standard                                             |
| BGL    | Below Ground Level                                              |
| COC    | Chain of Custody                                                |
| EC     | Electrical Conductivity                                         |
| EPA    | Environment Protection Authority                                |
| ESA    | Environmental Site Assessment                                   |
| HEPA   | Heads of Environmental Protection Authorities                   |
| LOR    | Limit of Reporting                                              |
| NEMP   | National Environmental Management Plan                          |
| NEPC   | National Environment Protection Council                         |
| QA     | Quality Assurance                                               |
| QC     | Quality Control                                                 |
| RWL    | Reduced water level                                             |
| SAQP   | Sampling and Analysis Quality Plan                              |
| UST    | Underground storage tanks                                       |



## Units

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

## Site Specific

|      |                            |
|------|----------------------------|
| OLA  | Ordnance Loading Area      |
| OMR  | Ongoing Monitoring Report  |
| OMP  | Ongoing Monitoring Plan    |
| PMAP | PFAS Management Area Plan  |
| RAAF | Royal Australian Air Force |

# 1 Introduction

The Australian Department of Defence (“Defence”) engaged Cardno, now Stantec (Cardno) to undertake the November 2021 and June 2022 groundwater, seepage water, surface water and sediment monitoring events at Royal Australian Air Force (RAAF) Base Learmonth (‘the Base’) as part of the Per- and Poly-Fluoroalkyl Substances (PFAS) Ongoing Monitoring Plan (OMP). An additional first flush surface water and sediment monitoring event was conducted in May 2022 following the first heavy rainfall of the wet season.

The Base is located approximately 30 km south of Exmouth, Western Australia (WA) and is displayed in Figure 1, Appendix A.

## 1.1 Background

The OMP outlines the rationale and scope for the monitoring of the concentrations and extent of PFAS in groundwater, seepage water, surface water and sediment originating from the Base. The monitoring program consists of biannual monitoring events, as well a ‘first flush’ surface water and sediment monitoring event conducted immediately (or as close as possible) following the first heavy rainfall event of the wet season.

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

- > ‘The Base is defined as RAAF Base Learmonth; and
- > The ‘Management Area’ is defined in the PFAS Management Area Plan (PMAP) as comprising the Base, plus the land to the east of the Base, including the salt pan, drainage channels, WAPET Creek, and extends to Exmouth Gulf.

## 1.2 Purpose and Objectives

The specific objectives of the monitoring specified in the OMP are to:

- > Evaluate the nature and extent (spatial and temporal) of PFAS impact in groundwater, seepage water and surface water pathways associated with the Base sources of PFAS derived from historical use of Aqueous Film-Forming Foam (AFFF);
- > Monitor the migration of PFAS in groundwater and surface water from the Base;
- > Provide confirmation of the current understanding of risk; and
- > Provide supporting data for assessment of management actions, where relevant.

The purposes of the Ongoing Monitoring Report (OMR) are to:

- > Inform Defence and key stakeholders of PFAS trends in surface water, groundwater and sediment;
- > Assess any variations in the distribution of PFAS for the Base and how this changes the understanding of the conceptual site model and risk profile; and
- > Provide recommendations for any potential changes in the location and frequency of sampling which may be incorporated in the revision of the OMP.

## 1.3 Scope of Work

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

- > Cardno, June 2022, *PFAS Ongoing Monitoring Plan Sampling and Analysis Quality Plan (SAQP) RAAF Base Learmonth*. Rev.6

The assessment included the following main components:

1. Undertake the November 2021 groundwater, surface water, seepage water and sediment monitoring event:
  - Gauging of 49 single and multi-level groundwater monitoring wells;
  - Sampling of 32 single level groundwater monitoring wells;

- Sampling of 17 multilevel groundwater monitoring wells;
  - Sampling of six seepage water locations;
  - Sampling of 12 surface water locations; and
  - Sampling of 48 surface soil/sediment locations.
2. Undertake the 2022 First Flush (May 22) surface water and sediment monitoring event:
- Sampling of 23 surface water locations; and
  - Sampling of 49 surface soil/sediment locations.
3. Undertake the June 2022 groundwater, surface water, seepage water and sediment monitoring event:
- Gauging of 48 single and multi-level groundwater monitoring wells;
  - Sampling of 31 single level groundwater monitoring wells;
  - Sampling of 17 multilevel groundwater monitoring wells;
  - Sampling of six seepage water locations;
  - Sampling of 26 surface water locations; and
  - Sampling of 49 surface soil/sediment locations.
4. Data assessment and reporting for the November 2021 – October 2022 monitoring period.

## 1.4 Standards of Assessment and Limitations

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

This report is not any of the following:

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

## 2 Site Setting

The Base is situated on the North-West Cape in the Pilbara Region of WA, in Learmonth, which is situated approximately 30 km south of the township of Exmouth. The Base covers an area of approximately 2,550 hectares (ha).

The buildings and associated infrastructure and support services include:

- > Runway, taxi way and aprons;
- > Aircraft hangars, shelters and Ordnance Loading Areas (OLAs);
- > Civilian Airport terminal;
- > Maintenance and workshop areas;
- > Explosive storage and preparation area;
- > Power stations;
- > General administration;
- > Domestic housing;
- > Fuel farm (former and current);
- > Former sewage treatment ponds;
- > Base potable water bore-field; and
- > There are also multiple underground storage tanks (USTs) and septic tanks across the Base.

### 2.1 Site Definition and Planning

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

Table 2-1 Site Identification Details

| Details                          | Description                               |
|----------------------------------|-------------------------------------------|
| Site Address                     | Minilya-Exmouth Road, Learmonth, WA 6707  |
| Land Description                 | RAAF Base Learmonth                       |
| Owner                            | Commonwealth of Australia                 |
| Planning Zone / Land use         | Public Purposes – Commonwealth Government |
| Local Government Authority (LGA) | Shire of Exmouth                          |

### 2.2 Surrounding Land Uses and Zoning

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

Table 2-2 Surrounding Land Uses

| Direction | Land Use                                                                                                                                                                |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| North     | Kailis Hatchery, Potshot Memorial and pastoral land.                                                                                                                    |
| East      | WAPET Creek, Solar Observatory, Bureau of Meteorology, pastoral land (Exmouth Gulf Station), Exmouth Gulf further east used for commercial aquaculture (prawn fishing). |
| West      | Base supply bore-field, pastoral land, Cape Range National Park further west.                                                                                           |
| South     | Various landfills, and pastoral land.                                                                                                                                   |

## 2.3 Management Area Description

The OMP includes sampling and analysis not only from the Base, but also from a number of surrounding (off-site) waterways. The Base and these surrounding areas are collectively referred to as the 'Management Area' (GHD, 2018). The Management Area boundaries are presented on Figure 2, Appendix A.

The monitoring zones include the source areas, the pathways (on-site and off-site drainage channels) and the receptor areas consisting of WAPET Creek and the Exmouth Gulf.

## 2.4 Environmental Setting

Key details defining the site are summarised in Table 2-3.

Table 2-3 Site Environmental Setting Key Details

| Setting           | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Climate           | <p>The region has a hot, semi-arid climate, with a wet and dry season. The maximum temperatures range between 38°C (January) and 24.4°C (July) while minimum temperatures range between 11.5°C (July) and 24.1°C (February), Bureau of Meteorology (BoM, 2022).</p> <p>Rainfall occurs generally between January and July with monsoonal showers between January and Late April. August to December is generally dry. The highest volume of rainfall typically occurs during the month of June with a mean monthly rainfall amount of 44 mm.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Topography        | <p>The Base is located on a coastal plain and is generally flat. The elevation on-site ranges between 0 and 20 meters relative to the Australian Height Datum (m AHD).</p> <p>To the west of the Base, the elevation at the coastal ranges increases 220 m AHD.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Acid Sulfate Soil | <p>A review of the Acid Sulfate Soils (ASS) risk mapping, available on the WA Atlas online database indicates the following:</p> <ul style="list-style-type: none"> <li>To the north of the Base is classified as having a moderate to low risk of ASS occurring within the top 3.0 m of natural soil but high to moderate risk of ASS beyond 3.0 m of natural soil surface.</li> <li>The salt pan to the east is classified as having a high to moderate risk of ASS occurring in the top 3.0 m of natural soil.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Hydrology         | <p>The Exmouth Gulf is located approximately 600 m east of the Base at its closest point. The Base is also crossed west to east by three ephemeral creeks.</p> <p>The Base contains a number of constructed drains that direct surface water towards drainage channels that discharge into WAPET Creek (Central and Southern Channels) or Exmouth Gulf (Northern Channel). Monitoring conducted as part of the OMP confirms that the water flow in these drains are limited to high rainfall events. The Northern Channel is inundated with seawater during high tides from the coast to the boundary of Base.</p> <p>WAPET Creek is located to the east of Base and is lined with mangroves. Water flows tidally in and out of the creek and low-lying areas around the creek are periodically inundated.</p> <ul style="list-style-type: none"> <li>The Northern Drainage Channel discharges directly to the Exmouth Gulf. It is a constructed drain on-site but links to a wide natural channel off-site that cuts through the coastal dunes.</li> <li>The Central Drainage Channel discharges into the northern reach of WAPET Creek. It is a straight constructed channel for its entire length.</li> <li>The Southern Drainage Channel discharges into the southern reach of WAPET Creek. It is a constructed drain on-site but links to a natural channel off-site that meanders across low lying salt pan topography.</li> </ul> <p>Stock drinking from these drainage channels have been observed during the monitoring events.</p> |
| Geology           | <p><b>Regional Geology</b></p> <p>The Base is underlain by quaternary age alluvial, aeolian and littoral sediments superimposed on the coastal plain (Geological Survey of Western Australia 1980).</p> <p>Further inland are Quaternary alluvium and colluvium deposits that have been derived from erosion of the Cape Ranges. The deposits include clays, silts, sands and gravels. The Cape Range forms the highlands to the west of the Base and are composed of Tertiary aged Cape Range limestone units.</p> <p>The coastal areas are fringed by Holocene aged beach and sand dunes consisting of quartz and calcarenite sands. An older Quaternary dune unit is located to the south of the</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

| Setting                       | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                               | <p>Base and dune forms are visible. Intertidal flats and mangrove swamps occur immediately west of the coastal sands and are associated with estuarine creeks.</p> <p><b>Site Specific Geology</b></p> <p>The findings of intrusive investigative works at the Base, undertaken by GHD between January and June 2018, were broadly consistent with the regional geology described above.</p> <ul style="list-style-type: none"> <li>▪ To the west of the Base - the geology encountered comprised of colluvium, sands and sandy clay underlain by limestone rock layer.</li> <li>▪ On Base – generally sands and clays were observed at the surface, underlain by colluvium/alluvium, gravels and sands and then weathered limestone rock</li> <li>▪ Salt pan area to the east of Base – generally sands and clays were observed at the surface, underlain by alluvium/colluvium and then shallow limestone rock. Outcrops of limestone displaying fossilised coral were observed along the southern reach of WAPET Creek.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Hydrogeology                  | <ul style="list-style-type: none"> <li>▪ <b>Groundwater Occurrence</b> – The Quaternary and Tertiary geology units are hydraulically connected and form a major, unconfined aquifer.<br/>Groundwater in the Quaternary units is considered to be perched and discontinuous. The superficial Quaternary layers (dunes, colluvium, alluvium) are considered to be no more than 20 m in thickness. Coastal dunes may also contain relatively fresh groundwater but of limited extent (lenses). This has not been assessed.<br/>The main regional aquifer occurs predominantly within the Tulki Limestone (within permeable beds and the karst system) on the flanks of the range and the Mandu Limestone (within joints and minor permeable beds) on the crest of the range. These units extend to depths of greater than 150 m.</li> <li>▪ <b>Depth to Groundwater</b> – During the November 2021 monitoring event, depth to groundwater was observed to range approximately between 1 metre below ground level (mbgl) and 6 mbgl with elevations ranging from -0.06 mAHD (MW103) to 1.2 mAHD (MW144). During the June 2022 monitoring event depth to groundwater was recorded beneath the Base at levels between 0.85 mbgl (MW180) and 7.75 m BGL (MW114), with groundwater elevations recorded between 0.811 mAHD (MW178) and 1.474 mAHD (MW165). Refer Figures 5 and 6, Appendix A.</li> <li>▪ <b>Groundwater Flow Direction</b> – The local groundwater flow pattern (GHD, 2018) at the Base was observed to be following the regional flow regime; that is, flowing toward the east. The calculated hydraulic gradient of groundwater across the Base was low and in the order of 0.0003 to 0.0005 metre per minute.<br/>The groundwater flow direction and hydraulic gradients greatly restricts the flow of contaminated groundwater from the Base to WAPET Creek or Exmouth Gulf. Instead, groundwater from the Base tends to flow towards an area of groundwater depression with elevated salinity that lies between the Base and the coast, with there being very little net flow to surface waters further to the east.<br/>Groundwater levels in wells near the coast are expected to be influenced by tidal pressure.<br/>The results of the OMP monitoring events supported the historical gauging results and groundwater flow directions, with some locations closer to the coast indicating a slight gradient to the coast.</li> <li>▪ <b>Salinity</b> – The results of the monitoring events in November 2021 and June 2022 were consistent with previous monitoring events, and indicated groundwater was generally brackish to saline in the western wells, with the groundwater becoming more saline closer to the coast.<br/>The saltwater wedge is expected to extend 5.0 km inland from the east coast (Martin, 1990). The DSI (GHD, 2018) identified the water was fresher in the shallow groundwater aquifer, likely due to rain infiltration. The salinity distribution in the inferred discharge area to the east of the Base is likely to have significant influence on PFAS migration and discharge. Groundwater flow towards the east is restricted by the preferential groundwater recharge zone through the coastal dunes.</li> <li>▪ <b>Groundwater Use</b> – The DWER groundwater database found no registered abstraction bores were identified within a 1.0 km radius of the Base.<br/>The Base is downgradient from the nearest potable water supply which is sourced from a series of wells near the base of Cape Range, 3 km to the west of the Base.</li> </ul> |
| Environmental Sensitive Areas | The Base is near the Cape Range National Park and Ningaloo Reef to the east.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

| Setting | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|         | <ul style="list-style-type: none"> <li>No Threatened Ecological Communities (TECs) with national environmental significance, were identified in the EPBC Act Protected Matters Report generated on November 2, 2017.</li> <li>Five priority flora species and 36 threatened or priority fauna species are known or expected to be present within 10 km of the Base.</li> <li>The mangrove wetlands are not listed on the Ramsar Convention on Wetlands of International Importance. It does however constitute a sensitive receptor.</li> </ul> |

## 2.5 Source Areas and Monitoring Zones

There are multiple monitoring areas, where PFAS was detected in soil or groundwater at concentrations exceeding the adopted assessment levels. These include (refer to Figure 2, Appendix A):

- > Maintenance Area (Source Area);
- > Former and current Fuel Farm (Source Area);
- > Southern Drainage Channel (Pathway);
- > Central Drainage Channel (Pathway);
- > Northern Drainage Channel (Pathway); and
- > WAPET Creek Northern Reach (Receptor).

The results of the DSI and OMP monitoring data collected to date indicate that the two main source areas are the Fuel Farm and the Maintenance Area. PFAS were found to be present in all environmental media tested (soils, groundwater, sediments, and surface water where present) in these source areas. PFAS were also detected at lower concentrations at a number of other locations across the Base.



## 3 Sampling and Analytical Methodology

### 3.1 Sampling Dates

A summary of the dates for each monitoring event of the November 2021 – October 2022 monitoring period is presented in Table 3-1.

Table 3-1 Summary of Sampling Dates

| Monitoring event | OMP Activity                                                     | Sampling Period        |
|------------------|------------------------------------------------------------------|------------------------|
| November 2021    | Groundwater monitoring (sampling and gauging)                    | 24 to 25 November 2021 |
|                  | Surface water, seepage water, surface soil and sediment sampling |                        |
| 2022 First flush | Surface water, surface soil and sediment sampling                | 17 to 18 May 2022      |
| June 2022        | Groundwater monitoring (sampling and gauging)                    | 22 to 23 June 2022     |
|                  | Surface water, seepage water, surface soil and sediment sampling |                        |

### 3.2 Groundwater Monitoring

Sampling of selected groundwater monitoring locations was conducted in general accordance with the SAQP (Cardno 2022, Appendix B), applying methods set out in Section 6.3.3 of the SAQP.

The monitoring network includes 32 single level monitoring wells and 17 multilevel monitoring wells. For the multilevel monitoring wells, only the shallowest (non-dry) screened intervals were sampled. The groundwater wells monitored as part of the OMP are presented in Table 3-2 and are shown on Figure 3, Appendix A.

Table 3-2 Groundwater Monitoring Well Locations

| Monitoring Area      | Monitoring Well ID                                                                                                                                        |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| On-site Source Areas | <b>Source 1 – Maintenance Area</b> – MW114, MW021, MW113, MW233, MW211, MW162, MW163, MW018, MW164, MW165, MW166, MW167, MW168, MW112, MW115.             |
|                      | <b>Source 2 – Fuel Farm</b> – MW238, MW105, MW148D, MW148S, MW151, MW159                                                                                  |
| Off-site Pathway     | MW122, MW146, MW147, MW180, MW181, MW172, MW170, MW127, MW126, MW139, MW140, MW102, MW138, MW145, MW103, MW104, MW134, MW135, MW175, MW124, MW144, MW143. |
| Off-site Receptor    | MW137, MW176, MW177, MW178, MW179, MW141.                                                                                                                 |

### 3.3 Seepage water Monitoring

Seepage water monitoring locations were chosen to assess the inferred groundwater discharge zone along the coast. They include locations near the mouth of WAPET Creek, the Northern Drainage Channel, a low point in the dunes near the southern reach and other locations along the coast. Seepage water monitoring and sampling was conducted in accordance with the SAQP (Cardno 2022, Appendix B), applying methods set out in Section 6.3.3 of the SAQP. The seepage water monitoring locations monitored as part of the OMP are listed in Table 3-3 and are shown on Figure 3, Appendix A.

Table 3-3 Seepage Water Monitoring Locations

| Monitoring Area                  | Location ID                                     |
|----------------------------------|-------------------------------------------------|
| Off-site Receptor (Exmouth Gulf) | OTH132, OTH134, OTH129, OTH103, OTH106, OTH107. |

### 3.4 Surface water Monitoring

Monitoring of selected surface water locations was conducted in general accordance with the SAQP (Cardno 2022, Appendix B), applying methods set out in Section 6.3.3 of the SAQP. The surface water locations monitored as part of the OMP are presented in Table 3-4 and are shown on Figure 4, Appendix A.

Table 3-4 Surface water Monitoring Locations

| Monitoring Area                            | Location ID                                                   |
|--------------------------------------------|---------------------------------------------------------------|
| Maintenance Area (Source Area)             | SW121, SW122, SW123, SW124, SW125, SW277, SW278               |
| Former and Current Fuel Farm (Source Area) | SW113, SW114, SW219, SW234, SW235                             |
| On-Site drains – Pathways 1b, 2b and 3b    | SW176, SW279, SW157, SW231, SW265, SW166, SW168, SW174, SW243 |
| Southern Drainage Channel (Pathway)        | SW199, SW200, SW298, SW301                                    |
| Central Drainage Channel (Pathway)         | SW108, SW170, SW227, SW291, SW292, SW293, SW198               |
| Northern Drainage Channel (Pathway)        | SW189, SW190, SW192, SW193, SW288                             |
| Southern reach of WAPET Creek (Receptor)   | SW205, SW207, SW208                                           |
| Northern reach of WAPET Creek (Receptor)   | SW209, SW210, SW211, SW300, SW302, SW303, SW304, SW305        |

### 3.5 Sediment/Surface Soil Monitoring

Sampling of selected sediment/surface soil monitoring locations was conducted in general accordance with the SAQP (Cardno 2022, Appendix B), applying methods set out in Section 6.3.4 of the SAQP. The sampling locations monitored as part of the OMP are presented in Table 3-5 and are shown on Figure 4, Appendix A.

Table 3-5 Sediment/Surface soil Monitoring Locations

| Monitoring Area                                               | Location ID                                                   |
|---------------------------------------------------------------|---------------------------------------------------------------|
| Maintenance Area (Source Area)                                | SS121, SS122, SS123, SS124, SS125, SS277, SS278               |
| Former and Current Fuel Farm (Source Area)                    | SS113, SS114, SD219, SS234, SS235                             |
| On-Site drains – Pathways 1b, 2b and 3b                       | SS176, SS279, SS157, SS231, SS265, SS166, SS168, SS174, SS243 |
| Southern Drainage Channel (Pathway)                           | SD199, SD200, SS298, SS301                                    |
| Central Drainage Channel (Pathway)                            | SS108, SS170, SS227, SS291, SS292, SS293, SS198               |
| Northern Drainage Channel (Pathway)                           | SS189, SS190, SS192, SS193, SS288                             |
| Southern reach of WAPET Creek (Receptor)                      | SD205, SD207, SD208                                           |
| Northern reach of WAPET Creek (Receptor)                      | SD209, SD210, SD211, SD300, SD301, SD302, SD303, SD304, SD305 |
| <b>Note:</b> 'SS' = shallow soil (dry), 'SD' = sediment (wet) |                                                               |

### 3.6 Deviations from the OMP SAQP

Deviations from the SAQP for the November 2021 – October 2022 monitoring period are summarised in Table 3-6.

Table 3-6 Summary of deviations from the OMP SAQP

| Location ID                                                                                                                                                                                                                                                        | Deviation                               | Comments                                                                                                                                                                                                                                                                                                                             |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>November 2021</b>                                                                                                                                                                                                                                               |                                         |                                                                                                                                                                                                                                                                                                                                      |
| MW016                                                                                                                                                                                                                                                              | Not sampled                             | MW016 was found filled with soil due to no gatic lid covering the well. MW238 was sampled instead as this well is also positioned downgradient of the Fuel Farm (source area 2) and historical data is available as this location was sampled as part of the DSI.                                                                    |
| SW219, SS234, SS235, SW114, SS113, SS231, SS157, SW265, SW189, SS190, SW288, SW193, SS192, SS198, SW293, SS292, SW291, SS227, SS108, SS170, SS168, SS279, SS166, SS243, SS174, SW121, SW122, SS124, SS277, SS125, SS278, SS176, SW123, SW199, SW200, SW298, SW210. | Not sampled for surface water           | These surface water areas were found dry. No impact to OMP as this still provides information (i.e., no surface water flow).                                                                                                                                                                                                         |
| SD200                                                                                                                                                                                                                                                              | Missing Sample Results                  | The analytical results for SD200 were not provided by the laboratory. It is likely this is due to the sample going missing. As location was sampled in subsequent monitoring events and no significant changes in concentration from historical events were observed, this is not expected to impact the quality of the OMP dataset. |
| All groundwater monitoring locations                                                                                                                                                                                                                               | Water quality meter not placed downhole | To prevent risks of cross contamination of the monitoring wells, the water quality parameters were taken from water collected from the hydrasleeves rather than placing the water quality meter inside the wells. No impact on the OMP.                                                                                              |
| <b>First Flush 2022 (May 22)</b>                                                                                                                                                                                                                                   |                                         |                                                                                                                                                                                                                                                                                                                                      |
| SW157, SW170, SW189, SW190, SW205, SW208, SW219, SW265, SW298.                                                                                                                                                                                                     | Incorrect pH readings                   | No impact, parameter not influencing any key OMP decisions.                                                                                                                                                                                                                                                                          |
| SW108, SW113, SW114, SW121, SW122, SW123, SW124, SW125, SW166, SW168, SW174, SW176, SW198, SW227, SW231, SW234, SW235, SW243, SW277, SW278, SW279, SW291, SW292, SW293, SW199, SW200.                                                                              | Not sampled for surface water           | These surface water areas were found dry. No impact to OMP as this still provides information (i.e., no surface water flow).                                                                                                                                                                                                         |
| <b>June 2022</b>                                                                                                                                                                                                                                                   |                                         |                                                                                                                                                                                                                                                                                                                                      |
| SW113, SW124, SW125, SW166, SW168, SW174, SW176, SW198, SW231, SW234, SW235, SW243, SW277, SW278, SW279, SW292, SW114, SW121, SW122, SW123, SW219, SW291, SW293                                                                                                    | Not sampled for surface water           | These surface water areas were found dry. No impact to OMP as this still provides information (i.e., no surface water flow).                                                                                                                                                                                                         |
| MW103                                                                                                                                                                                                                                                              | Not sampled                             | No access due to area flooded. Limited impact on the OMP, no data collected for June 2022.                                                                                                                                                                                                                                           |
| MW016                                                                                                                                                                                                                                                              | Not sampled                             | MW016 was found filled with soil due to no gatic lid covering the well. MW238 was sampled instead as this well is also positioned downgradient of the Fuel Farm (source area 2) and historical data is available as this location was sampled as part of the DSI.                                                                    |
| All groundwater monitoring locations                                                                                                                                                                                                                               | Water quality meter not placed downhole | To prevent risks of cross contamination of the monitoring wells, the water quality parameters were taken from water collected from the hydrasleeves rather than placing the water quality meter inside the wells. No impact on the OMP.                                                                                              |

### 3.7 Changes to the Monitoring Network Condition

It is noted that bore MW016 is filled with soil and can no longer be sampled for groundwater. As noted above, MW238 was sampled in place of MW016 as it is also located downgradient of the source area 2 (Fuel Farm). No other changes to the monitoring network condition were noted.

## 4 Quality Control / Quality Assurance

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

- > QA documentation;
- > Bias;
- > Data Representativeness;
- > Data Precision & Accuracy;
- > Laboratory Performance;
- > Data Comparability; and
- > Data Set Completeness.

A detailed review of the Quality Assurance/Quality Control (QA/QC) aspects was completed during the monitoring events and are included within the factual reports presented in Appendix C.

### 4.1 Summary

The laboratory has undertaken different Quality Control (QC) measures in all sets of sample analysis which validate the accuracy of their techniques. The laboratory is appropriately certified for environmental sample analysis. It is considered that the results are accurate and reliable for the purposes of this assessment.

The data validation process has concluded that there are no significant systematic errors in the data collection process. Therefore, the data set used as the basis for the surface water, groundwater and sediment assessment is considered valid and complete.

## 5 Assessment Criteria

### 5.1 Groundwater, Seepage Water and Surface water

The assessment levels adopted for groundwater and surface water in this OMP are based upon the Heads of Environmental Protection Authorities (HEPA) Australia and New Zealand (2020) PFAS National Environmental Management Plan 2.0 (NEMP) (HEPA 2020) and findings of the DSI (GHD 2018). The adopted assessment criteria for groundwater, seepage water and surface water are detailed in Table 5-1.

Table 5-1 Criteria for Groundwater, Seepage Water and Surface water

| Exposure Scenario                   | Adopted Assessment Criteria |                   | Guidance              |
|-------------------------------------|-----------------------------|-------------------|-----------------------|
|                                     | PFHxS / PFOS<br>µg/L        | PFOA <sup>1</sup> |                       |
| Human Health – Recreational Water   | 2 <sup>2</sup>              | 10                | NHMRC 2019, HEPA 2020 |
| Ecological – 99% species protection | 0.00023 <sup>3</sup>        | 19                | HEPA 2020             |

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

### 5.2 Sediment

It is noted that there are currently no Australian regulatory endorsed assessment levels for risk posed to ecology or human health by PFAS in sediment. The sediment concentrations are compared to the historical range of ongoing monitoring results and new maximum concentrations or first-time detections at each sediment sampling location are recorded.

## 6 Contextual and Ancillary Information

### 6.1 Additional Analytical Data

All data available on the ESdat database at the time of reporting for each OMP monitoring location was utilised to form the basis of the interpretations and conclusions presented in this report.

### 6.2 Remediation and Infrastructure Projects

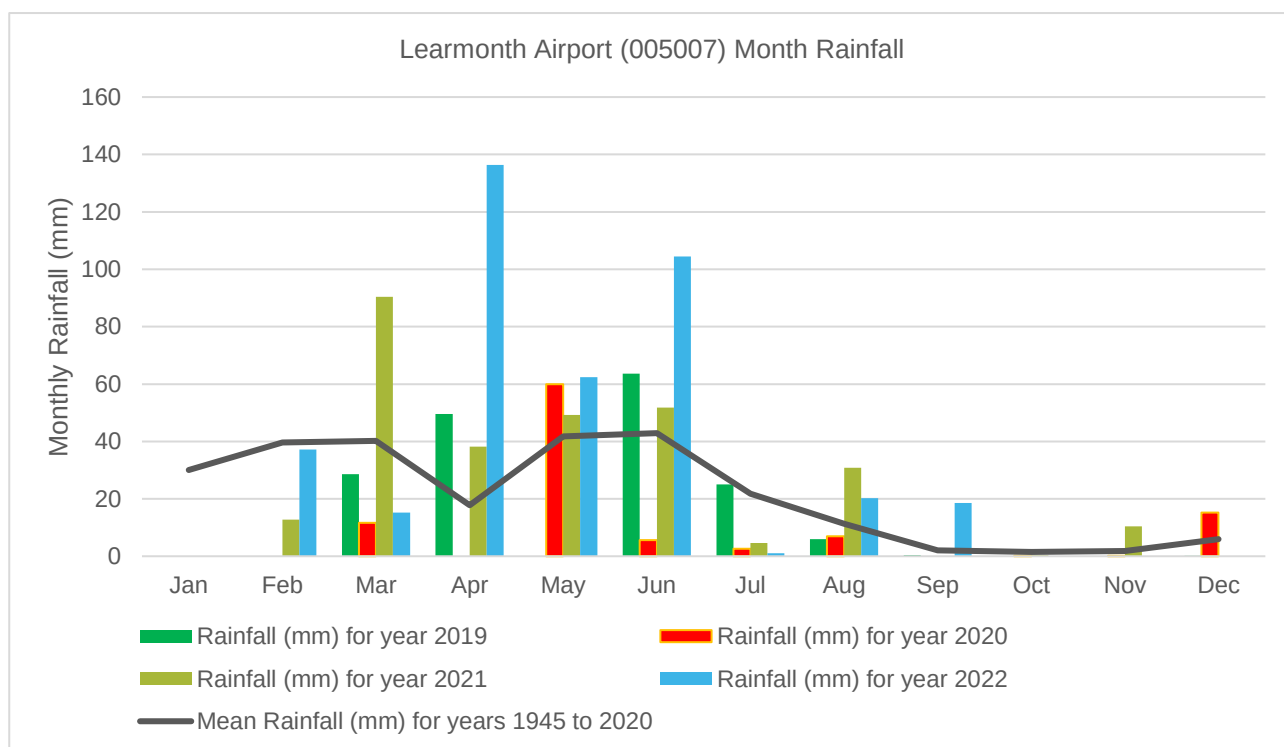
No remediation project or infrastructure works that could affect the interpretation of monitoring results were undertaken at the Base during the monitoring period.

### 6.3 Climate

Rainfall can potentially influence the PFAS migration and groundwater levels. Monthly rainfall for January 2019 to December 2022 obtained from the Bureau of Meteorology (BoM) Learmonth airport Station No 005007 is displayed in Figure 6-1.

The monthly rainfall amounts for the November 2021 – October 2022 monitoring period were below average for December 2021 and January 2022 to March 2022 and above for the months of November 2021 and April 2022 to June 2022.

Figure 6-1 Monthly rainfall and long term mean monthly rainfall for Learmonth Airport (station 005007) (BoM, 2022)



There were variations in rainfall throughout 2022 and the wet season rainfall was above monthly means, however, it is noted that these climatic conditions have not affected the groundwater gradient or flow direction for the Management Area. Flooding of the low lying area between the Base and WAPET Creek, and north of the Base, was observed during the June 2022 monitoring event.

## 7 Monitoring Data Summary

The November 2021, first flush (May 2022) and June 2022 monitoring results are presented within the factual reports provided in Appendix C. Consolidated data tables are presented in Appendix D.

### 7.1 Groundwater

#### 7.1.1 Groundwater geochemical parameters

Groundwater geochemical parameters recorded during the November 2021 and June 2022 monitoring events are summarised in Table 7-1 and provided within Table 4, Appendix D.

Table 7-1 Groundwater Geochemical Parameters

| Parameter | November 2021                                                                               | June 2022                                                                                    |
|-----------|---------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| DO        | 0.67 mg/L (MW148D) – 4.64 mg/L (MW211)<br><i>Aerobic conditions</i>                         | 0.4 mg/L (MW139) – 4.14 mg/L (MW238)<br><i>Aerobic conditions</i>                            |
| EC        | 1,707 µS/cm (MW233) – 103,120 µS/cm (MW181)<br><i>Marginal to saline water</i>              | 1,983 µS/cm (MW233) – 101,760 µS/cm (MW181)<br><i>Marginal to saline water</i>               |
| pH        | 6.84 (MW1159) – 8.43 (MW211)<br><i>Near neutral to slightly alkaline conditions</i>         | 6.79 (MW159) – 8.3 (MW211)<br><i>Near neutral to slightly alkaline conditions</i>            |
| ORP       | -172.1 mV (MW138) – 5967 mV (MW238)<br><i>Reducing to oxidising groundwater conditions.</i> | -208.8 mV (MW115) – 109.7 mV (MW178)<br><i>Reducing to oxidising groundwater conditions.</i> |

The geochemical parameters were generally within the historical ranges recorded for the Base. No noticeable seasonal variability was observed.

#### 7.1.2 Groundwater elevations and migration contours

Groundwater levels recorded during the November 2021 and June 2022 monitoring events and inferred flow directions are summarised in Table 7-2 and gauging data is provided within Table 3, Appendix D. Figure 5, Appendix A, presents the inferred groundwater contours for the November 2021 monitoring event and Figure 6, Appendix A, presents the inferred groundwater contours for the June 2022 monitoring event. Wells close to the coast may be influenced by tidal pressures; these were generally gauged during outgoing tides.

Table 7-2 Groundwater Levels and Flow Direction

| Item                                         | November 2021                                                                                                                                                                                        | June 2022                                |
|----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|
| Depths to groundwater                        | 1.501 (MW137) – 6.54 (MW114)                                                                                                                                                                         | 0.85 (MW180) – 6.32 (MW114)              |
| Groundwater elevation                        | -0.06 mAHD (MW103) to 1.2 mAHD (MW144)                                                                                                                                                               | 0.811 mAHD (MW178) to 1.474 mAHD (MW165) |
| Inferred direction of groundwater flow       | Groundwater was interpreted to flow towards an area of groundwater depression that lies between the Base and the coast, with there being very little net flow to surface waters further to the east. |                                          |
| Seasonal difference in groundwater elevation | Groundwater levels were on average 0.63 m deeper during the November 2021 event (dry season).                                                                                                        |                                          |

Groundwater elevations and flow direction for the monitoring period were consistent with historical data. It is noted that the June 2022 groundwater reduced water levels (RWL) were generally higher than historical range, which can be related to the high rainfall in the 2022 wet season.

#### 7.1.3 On-site Source Areas Summary Results

As indicated the source areas consist of:

- > Source Area 1A – Maintenance Area; and
- > Source Area 2A & 2B – Fuel Farm.

Groundwater monitoring well locations are displayed on Figure 3, Appendix A.

#### 7.1.3.1 Source Area 1 – Maintenance Area

During the most recent monitoring event (June 2022) the following conditions and results were recorded for Source Area 1:

- > Groundwater was marginal to saline across the Management Area with total dissolved solids (TDS) concentrations ranging from 1,287 mg/L to 68,383 mg/L;
- > Near neutral to slightly alkaline pH 6.89 to 8.3;
- > 13 out of 15 groundwater samples from the source area monitoring wells reported detectable PFAS concentrations. All 13 samples exceeded the adopted ecological criteria (99% species protection level for fresh and marine water) of the laboratory limit of reporting (LOR – 0.01 µg/L) for PFOS.

During the November 2021 – October 2022 monitoring period:

- > Detectable concentrations of PFOA ranged from 0.01 µg/L (MW66, June 2022) to 0.32 µg/L (MW063, November 2021);
- > Detectable concentrations for the sum of PFOS and PFHxS ranged from 0.01 µg/L (MW165, November 2021) to 10.3 µg/L (MW163, November 2021). A total of 12 monitoring wells across the source area reported concentrations above the HEPA (2020) recreational use criteria (2.0 µg/L) during the monitoring period;
- > Detectable concentrations of PFOS (considered exceedances of the HEPA ecological criteria for 99% species protection) ranged from 0.01 µg/L (MW165, November 2021) to 4.24 µg/L (MW211, June 2022);
- > No first-time detections were reported for the source area monitoring wells;
- > No new exceedances of the assessment criteria were reported; and
- > New maximum and minimum concentrations were recorded across the Source Area 1, highlighted in Table 7-3 below.

It is noted there is data available for PFOA and PFOS for selected monitoring wells from September 2010 across Source Area 1. Where available this data has been assessed as part of this investigation. However, it is also noted that PFHxS was not reported until 2018.

A summary of the PFOA, PFOS and the sum of PFOS and PFHxS concentrations for the reporting period and the historical concentration ranges for Source Area 1 monitoring locations are presented in Table 7-3, with a trend graph for the sum of PFOS and PFHxS concentrations plotted on Figure 7-1.

The highest PFOA and sum of PFOS and PFHxS concentrations were recorded at MW163 in November 2021. The highest PFOS concentration was recorded at MW211 in June 2022. New maximum PFAS concentrations were recorded at monitoring well locations MW021, MW115, MW163, MW164, MW166, MW167 and MW168. There were no new exceedances of the adopted human health assessment criteria for the sum of PFOS and PFHxS.

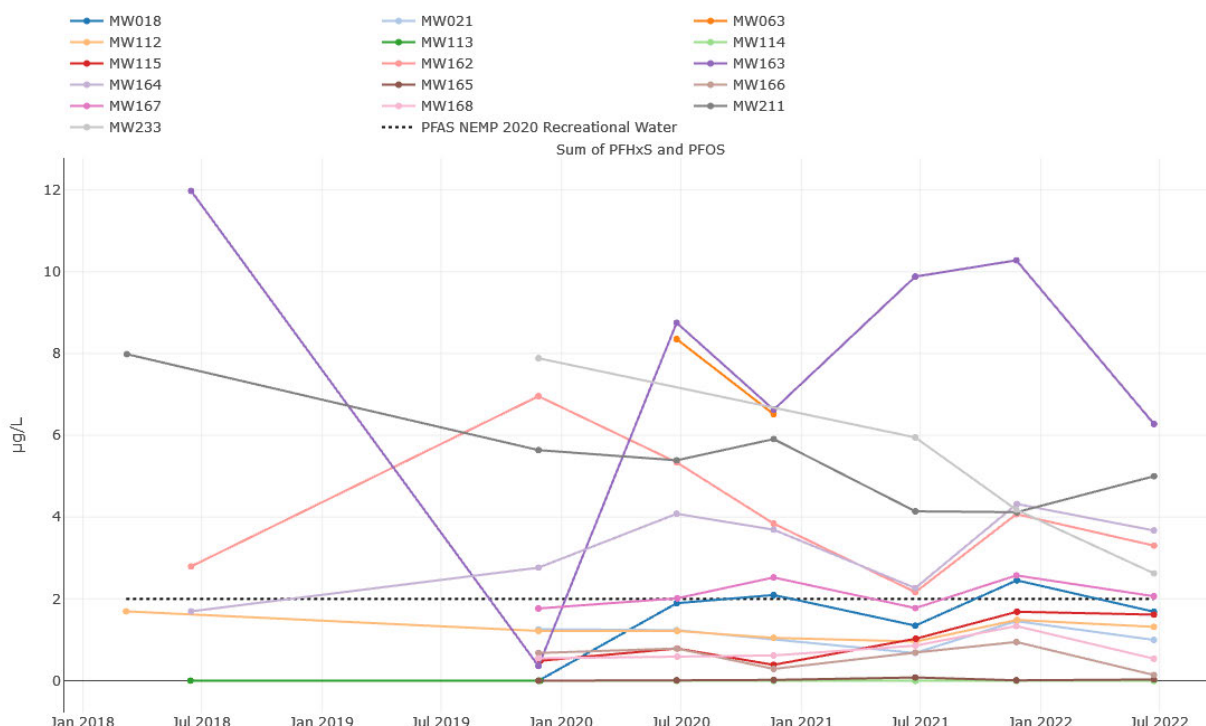
Table 7-3 Source Area 1 – Maintenance Area. Groundwater PFOA, PFOS and Sum of PFOS and PFHxS Concentrations

| Location ID | Analyte        | Historical range | OMP Monitoring  |                 |
|-------------|----------------|------------------|-----------------|-----------------|
|             |                | Min – Max (µg/L) | Nov 2021 (µg/L) | Jun 2022 (µg/L) |
| MW018       | PFOS           | <0.01 – 2.50     | 0.88            | 0.55            |
|             | PFOS and PFHxS | <0.01 – 2.93     | 2.46            | 1.69            |
|             | PFOA           | <0.01 – 0.08     | 0.07            | 0.09            |
| MW021       | PFOS           | <0.01 – 0.29     | 0.42            | 0.33            |
|             | PFOS and PFHxS | 0.31 – 1.26      | 1.46            | 1.00            |
|             | PFOA           | <0.01 – 0.02     | 0.02            | 0.02            |
| MW112       | PFOS           | 0.56 – 1.10      | 0.93            | 0.77            |
|             | PFOS and PFHxS | 0.96 – 1.70      | 1.49            | 1.32            |
|             | PFOA           | <0.05 – 0.02     | 0.02            | 0.02            |



| Location ID | Analyte        | Historical range | OMP Monitoring  |                 |
|-------------|----------------|------------------|-----------------|-----------------|
|             |                | Min – Max (µg/L) | Nov 2021 (µg/L) | Jun 2022 (µg/L) |
| MW113       | PFOS           | <0.01 – 0.002    | <0.01           | <0.01           |
|             | PFOS and PFHxS | <0.01 – 0.003    | <0.01           | <0.01           |
|             | PFOA           | <0.001           | <0.01           | <0.01           |
| MW114       | PFOS           | <0.01 - 0.002    | <0.01           | <0.01           |
|             | PFOS and PFHxS | <0.01 – 0.004    | <0.01           | <0.01           |
|             | PFOA           | <0.001           | <0.01           | <0.01           |
| MW115       | PFOS           | 0.020 – 0.12     | 0.29            | 0.27            |
|             | PFOS and PFHxS | 0.18 – 1.03      | 1.69            | 1.62            |
|             | PFOA           | <0.01 - 0.02     | 0.03            | 0.03            |
| MW162       | PFOS           | 0.13 - 0.37      | 0.29            | 0.30            |
|             | PFOS and PFHxS | 2.17 – 6.97      | 4.08            | 3.31            |
|             | PFOA           | 0.05 – 0.12      | 0.09            | 0.09            |
| MW163       | PFOS           | 0.10 - 5.0       | 3.57            | 0.70            |
|             | PFOS and PFHxS | 0.36 - 12        | 10.30           | 6.29            |
|             | PFOA           | <0.05 - 0.30     | 0.32            | 0.06            |
| MW164       | PFOS           | 0.38 – 2.01      | 1.77            | 0.94            |
|             | PFOS and PFHxS | 1.70 – 4.09      | 4.33            | 3.68            |
|             | PFOA           | 0.058 – 0.12     | 0.10            | 0.09            |
| MW165       | PFOS           | <0.01 - 0.02     | 0.01            | 0.02            |
|             | PFOS and PFHxS | <0.01 - 0.08     | 0.01            | 0.03            |
|             | PFOA           | <0.01 - 0.002    | <0.01           | <0.01           |
| MW166       | PFOS           | 0.16 – 0.35      | 0.47            | 0.07            |
|             | PFOS and PFHxS | 0.29 – 0.79      | 0.95            | 0.14            |
|             | PFOA           | 0.03 – 0.15      | 0.14            | 0.01            |
| MW167       | PFOS           | 0.49 – 1.22      | 1.08            | 1.04            |
|             | PFOS and PFHxS | 1.18 – 2.53      | 2.58            | 2.07            |
|             | PFOA           | 0.12 – 0.18      | 0.17            | 0.14            |
| MW168       | PFOS           | 0.03 - 0.10      | 0.12            | 0.12            |
|             | PFOS and PFHxS | 0.55 - 0.86      | 1.34            | 0.54            |
|             | PFOA           | 0.01 - 0.02      | 0.04            | 0.02            |
| MW211       | PFOS           | 2.92 – 6.2       | 2.81            | 4.24            |
|             | PFOS and PFHxS | 4.15 – 8         | 4.13            | 5.01            |
|             | PFOA           | 0.06 – 0.17      | 0.08            | 0.05            |
| MW233       | PFOS           | 1.40 – 6.7       | 2.11            | 1.06            |
|             | PFOS and PFHxS | 2.8 – 8.6        | 4.19            | 2.63            |
|             | PFOA           | 0.20 – 0.71      | 0.22            | 0.11            |
| New Maximum |                | New Minimum      | New Exceedance  |                 |

Figure 7-1 Source Area 1 – Maintenance Area Sum of PFOS and PFHxS Concentration Trends



#### 7.1.3.2 Source Area 2 – Fuel Farm

During the most recent monitoring event (June 2022) the following conditions and results were recorded for Source Area 2.

- > Groundwater was brackish to saline with TDS concentrations ranging from 6,589 mg/L to 50,104 mg/L;
- > Near neutral pH 6.91 to 7.6;
- > Five of the six groundwater samples from the source area reported detectable PFAS concentrations with MW159 reporting below the laboratory LOR. All five samples exceeded the adopted ecological criteria (99% species protection level for fresh and marine water) of the laboratory LOR for PFOS; and
- > No first-time detections or new exceedances were reported for the source area monitoring wells.

During the November 2021 – October 2022 monitoring period:

- > Detectable concentrations of PFOA ranged from 0.01 µg/L (MW105, November 2021 and June 2022) to 2.30 µg/L (MW238, November 2021);
- > Detectable concentrations of PFOS (considered exceedances of the HEPA ecological criteria for 99% species protection) ranged from 0.04 µg/L (MW105, November 2021 and June 2022) to 42.9 µg/L (MW238, November 2022);
- > Detectable concentrations for the sum of PFOS and PFHxS ranged from 0.96 µg/L (MW105, June 2022 event) to 87.7 µg/L (MW238 November 2021). Four out of six locations across the source area reported concentrations above the HEPA (2020) criteria for recreational use; and
- > A new maximum concentration was recorded at MW105 (0.99 µg/L detected) for sum of PFOS and PFHxS and at MW238 (4.42 µg/L detected) for PFOA. MW148S recorded new maximums of PFOS (33.10 µg/L), sum of PFOS and PFHxS (78.30 µg/L) and PFOA (2.73 µg/L) in November 2021. These new concentration maximums were within the same order of magnitude as historical maximums.

A summary of the PFOA, PFOS and the sum of PFOS and PFHxS concentrations for the monitoring period and the historical concentration ranges for Source Area 2 monitoring locations are presented in Table 7-4, with a trend graph for the sum of PFOS and PFHxS concentrations plotted on Figure 7-2.

The highest PFOA, PFOS and sum of PFOS and PFHxS concentrations were recorded in MW238, with a new maximum PFOA concentration recorded at this location in November 2021. It is noted that this location has only one 'historical' concentration recorded in March 2020.

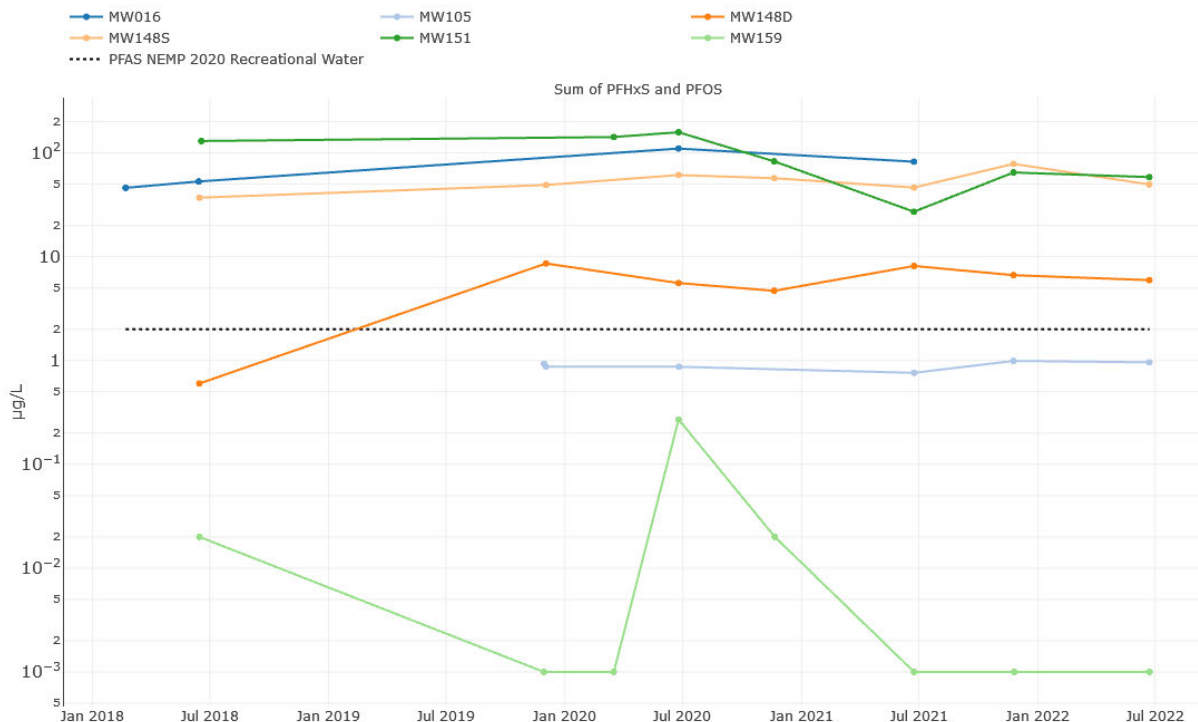
Table 7-4 Source Area 2 – Fuel Farm. Groundwater PFOA, PFOS and Sum of PFOS and PFHxS Concentrations

| Location ID | Analyte        | Historical range | OMP Monitoring  |                 |
|-------------|----------------|------------------|-----------------|-----------------|
|             |                | Min – Max (µg/L) | Nov 2021 (µg/L) | Jun 2022 (µg/L) |
| MW105       | PFOS           | 0.031 – 0.05     | 0.04            | 0.04            |
|             | PFOS and PFHxS | 0.771 – 0.93     | 0.99            | 0.96            |
|             | PFOA           | <0.01 - 0.011    | 0.01            | 0.01            |
| MW148D      | PFOS           | 0.25 – 3.13      | 2.56            | 2.20            |
|             | PFOS and PFHxS | 0.60 - 8.60      | 6.63            | 5.94            |
|             | PFOA           | 0.019 - 0.35     | 0.25            | 0.21            |
| MW148S      | PFOS           | 9.40 – 24.2      | 33.10           | 21.20           |
|             | PFOS and PFHxS | 37.00 – 57.0     | 78.30           | 49.60           |
|             | PFOA           | 1.40 - 2.24      | 2.73            | 1.67            |
| MW151       | PFOS           | 13.90 – 72.6     | 29.40           | 28.80           |
|             | PFOS and PFHxS | 27.10 - 158      | 64.70           | 58.40           |
|             | PFOA           | 1.59 - 6.6       | 2.45            | 2.05            |
| MW159       | PFOS           | <0.001 - 0.02    | <0.01           | <0.01           |
|             | PFOS and PFHxS | <0.001 - 0.020   | <0.01           | <0.01           |
|             | PFOA           | <0.001 - 0.01    | <0.01           | <0.01           |
| MW238       | PFOS           | 53.90            | 42.90           | 11.40           |
|             | PFOS and PFHxS | 104.00           | 87.70           | 20.20           |
|             | PFOA           | 4.08             | 4.42            | 0.59            |
| New Maximum |                | New Minimum      | New Exceedance  |                 |

**Note:**

NS – Not sampled

Figure 7-2 Source Area 2 – Fuel Farm Sum of PFOS and PFHxS Concentration Trends



**Note:** A logarithmic scale is used for the vertical axis.

#### 7.1.4 On-site pathway

The on-site groundwater pathway represents the area between the on-site source area and the eastern site boundaries.

During the most recent monitoring event (June 2022) the following conditions and results were recorded for the on-site pathway area:

- > Groundwater was saline across the Management Area with TDS concentrations ranging from 21,612 mg/L to 57,625 mg/L;
- > Near neutral pH 6.91 to 7.56; and
- > Four out of nine groundwater samples from the on-site pathway area monitoring wells reported detectable PFAS concentrations and exceeded the adopted ecological criteria (99% species protection level for fresh and marine water) of the laboratory LOR for PFOS.

During the November 2021 – October 2022 monitoring period:

- > Detectable concentrations of PFOS ranged from 0.01 µg/L (MW103, November 2021) to 1.39 µg/L (MW172, November 2021);
- > Detectable concentrations for the sum of PFOS and PFHxS ranged from 0.05 µg/L (MW104, November 2021) to 7.6 µg/L (MW172, November 2021). Both samples from MW172 were reported above the HEPA (2020) recreational use criteria; and
- > New maximum concentrations were recorded (MW104 and MW170) for sum of PFOS and PFHxS.

A summary of the PFOA, PFOS and the sum of PFOS and PFHxS concentrations for the monitoring period and the historical concentration ranges for the on-site pathway area monitoring locations are presented in Table 7-5, with a trend graph for the sum of PFOS and PFHxS concentrations plotted on Figure 7-3.

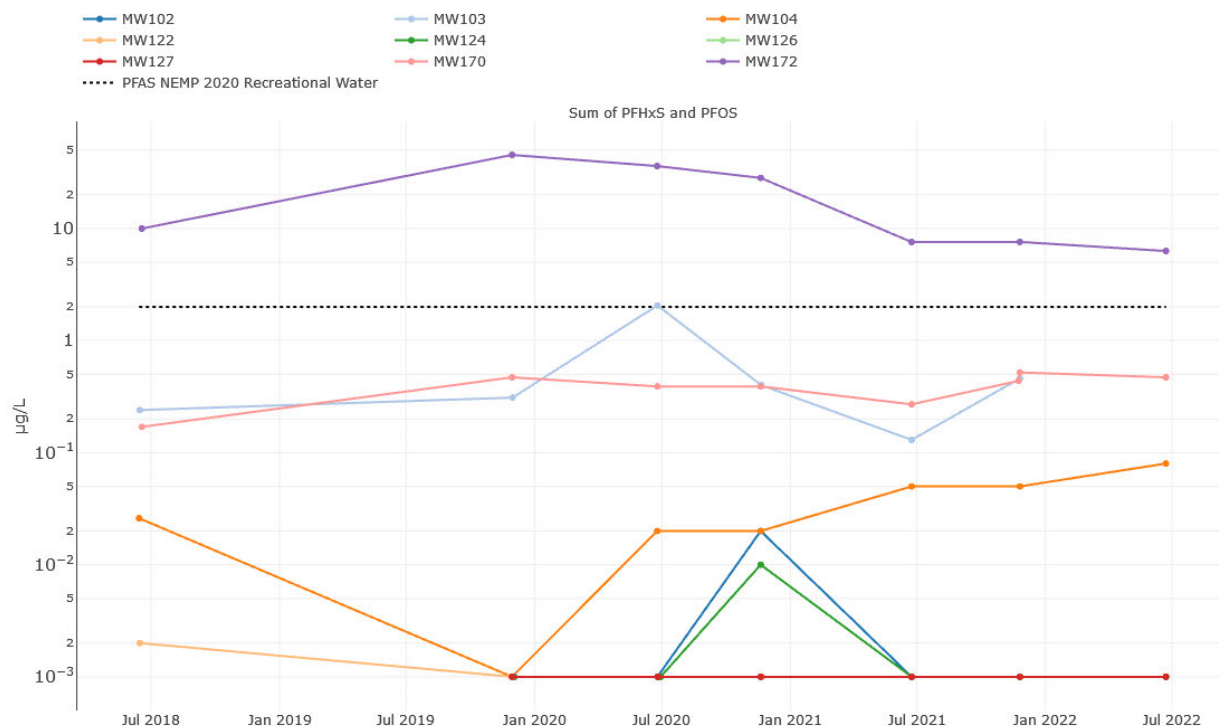
Table 7-5 On-site pathway. Groundwater PFOA, PFOS and Sum of PFOS and PFHxS Concentrations

| Location ID | Analyte        | Historical range | OMP Monitoring  |                 |
|-------------|----------------|------------------|-----------------|-----------------|
|             |                | Min – Max (µg/L) | Nov 2021 (µg/L) | Jun 2022 (µg/L) |
| MW102       | PFOS           | <0.01 – 0.02     | <0.01           | <0.01           |
|             | PFOS and PFHxS | <0.01– 0.02      | <0.01           | <0.01           |
|             | PFOA           | <0.01            | <0.01           | <0.01           |
| MW103       | PFOS           | 0.004 – 0.36     | 0.01            | NS              |
|             | PFOS and PFHxS | 0.13 – 2.06      | 0.46            |                 |
|             | PFOA           | <0.01 – 0.07     | <0.01           |                 |
| MW104       | PFOS           | <0.01 – 0.02     | <0.01           | <0.01           |
|             | PFOS and PFHxS | <0.01 – 0.05     | 0.05            | 0.08            |
|             | PFOA           | <0.01            | <0.01           | <0.01           |
| MW122       | PFOS           | <0.001 - 0.001   | <0.01           | <0.01           |
|             | PFOS and PFHxS | <0.001 - 0.002   | <0.01           | <0.01           |
|             | PFOA           | <0.01            | <0.01           | <0.01           |
| MW124       | PFOS           | <0.01 – 0.005    | <0.01           | <0.01           |
|             | PFOS and PFHxS | <0.01 – 0.007    | <0.01           | <0.01           |
|             | PFOA           | <0.001 – 0.001   | <0.01           | <0.01           |
| MW126       | PFOS           | <0.001 – 0.009   | <0.01           | <0.01           |
|             | PFOS and PFHxS | <0.001 – 0.009   | <0.01           | <0.01           |
|             | PFOA           | <0.01            | <0.01           | <0.01           |
| MW127       | PFOS           | <0.01            | <0.01           | <0.01           |
|             | PFOS and PFHxS | <0.01            | <0.01           | <0.01           |
|             | PFOA           | <0.01            | <0.01           | <0.01           |
| MW170       | PFOS           | <0.01 - 0.03     | <0.01           | <0.01           |
|             | PFOS and PFHxS | 0.17 - 0.47      | 0.52            | 0.47            |
|             | PFOA           | <0.01 – 0.001    | <0.01           | <0.01           |
| MW172       | PFOS           | 0.51 - 5.46      | 1.39            | 1.22            |
|             | PFOS and PFHxS | 7.58 - 45.40     | 7.60            | 6.30            |
|             | PFOA           | 0.35 - 1.12      | 0.36            | 0.30            |
| New Maximum |                | New Minimum      | New Exceedance  |                 |

**Note:**

NS – Not sampled – Refer to Section 3.6 for details

Figure 7-3 On-site Pathways Sum of PFOS and PFHxS Concentration Trends



**Note:** A logarithmic scale is used for the vertical axis.

### 7.1.5 Off-site pathways

The off-site pathway areas are identified as:

- > Area west of WAPET Creek;
- > Northern Drainage Channel;
- > Central Drainage Channel; and
- > Southern Drainage Channel.

The groundwater results for these areas are discussed in the following sections.

#### 7.1.5.1 Off-site Area west of WAPET Creek

During the most recent monitoring event (June 2022) the following conditions were recorded for the off-site area west of WAPET Creek:

- > Groundwater was saline across the area with TDS ranging from 24,082.5 mg/L to 66,170 mg/L; and
- > Near neutral pH 6.95 to 7.8.

During the November 2021 – October 2022 monitoring period:

- > No detectable concentrations of PFOA, PFOS or the sum of PFOS and PFHxS were recorded in any of the seven monitoring well across the area.

A summary of the PFOA, PFOS and the sum of PFOS and PFHxS concentrations for the reporting period and the historical concentration ranges for the off-site area to the west of WAPET Creek monitoring locations are presented in Table 7-6. It is noted that the results are below laboratory LOR and therefore the results have not been plotted.

Table 7-6 Area west of WAPET Creek. Groundwater PFOA, PFOS and Sum of PFOS and PFHxS Concentrations

| Location ID | Analyte        | Historical range | OMP Monitoring  |                 |
|-------------|----------------|------------------|-----------------|-----------------|
|             |                | Min – Max (µg/L) | Nov 2021 (µg/L) | Jun 2022 (µg/L) |
| MW143       | PFOS           | <0.001 – 0.001   | <0.01           | <0.01           |
|             | PFOS and PFHxS | <0.001 – 0.001   | <0.01           | <0.01           |
|             | PFOA           | <0.001           | <0.01           | <0.01           |
| MW144       | PFOS           | <0.001 – 0.002   | <0.01           | <0.01           |
|             | PFOS and PFHxS | <0.001 - 0.002   | <0.01           | <0.01           |
|             | PFOA           | <0.001 - 0.002   | <0.01           | <0.01           |
| MW145       | PFOS           | <0.001 – 0.001   | <0.01           | <0.01           |
|             | PFOS and PFHxS | <0.001           | <0.01           | <0.01           |
|             | PFOA           | <0.001           | <0.01           | <0.01           |
| MW146       | PFOS           | <0.001 – 0.005   | <0.01           | <0.01           |
|             | PFOS and PFHxS | <0.001 – 0.005   | <0.01           | <0.01           |
|             | PFOA           | <0.001 – 0.003   | <0.01           | <0.01           |
| MW147       | PFOS           | 0.002 – 0.005    | <0.01           | <0.01           |
|             | PFOS and PFHxS | 0.0002 – 0.007   | <0.01           | <0.01           |
|             | PFOA           | <0.001 – 0.002   | <0.01           | <0.01           |
| MW180       | PFOS           | <0.01 – 0.12     | <0.01           | <0.01           |
|             | PFOS and PFHxS | <0.01 – 0.12     | <0.01           | <0.01           |
|             | PFOA           | <0.001           | <0.01           | <0.01           |
| MW181       | PFOS           | <0.01 – 0.11     | <0.01           | <0.01           |
|             | PFOS and PFHxS | <0.01 – 0.11     | <0.01           | <0.01           |
|             | PFOA           | <0.01 – 0.002    | <0.01           | <0.01           |
| New Maximum |                | New Minimum      | New Exceedance  |                 |

**Note:**

MW000 – multi-level monitoring well, the shallowest screen interval sample results have been used for the assessment.

#### 7.1.5.2 Off-site Northern Drainage Channel

During the most recent monitoring event (June 2022) the following conditions and results were recorded for the off-site Northern Drainage channel area:

- > Groundwater was brackish to saline across the area with TDS ranging from 2,262 mg/L to 39,585 mg/L;
- > Near neutral pH 7.02 to 7.82.

During the November 2021 – October 2022 monitoring period:

- > One of the three monitoring wells across the area reported detectable PFAS concentrations. The one sample collected from MW135 in November 2021 exceeded the adopted ecological criteria (99% species protection level for fresh and marine water) of the laboratory LOR for PFOS (0.09 µg/L);
- > No detectable concentrations of PFOA were reported;
- > One detectable concentration for the sum of PFOS and PFHxS of 0.2 µg/L (MW135) was reported during the November 2021 event; and
- > New maximums for PFOS and the sum of PFOS and PFHxS were recorded for MW135.

A summary of the PFOA, PFOS and the sum of PFOS and PFHxS concentrations for the reporting period and the historical concentration ranges for the off-site Northern Drainage Channel monitoring locations are presented in Table 7-7. It is noted that the results are predominantly below laboratory LOR and therefore the results have not been plotted.

Table 7-7 Northern Drainage Channel Groundwater PFOA, PFOS and Sum of PFOS and PFHxS Concentrations

| Location ID | Analyte        | Historical range | OMP Monitoring  |                 |
|-------------|----------------|------------------|-----------------|-----------------|
|             |                | Min – Max (µg/L) | Nov 2021 (µg/L) | Jun 2022 (µg/L) |
| MW134       | PFOS           | <0.001– 0.02     | <0.01           | <0.01           |
|             | PFOS and PFHxS | <0.001– 0.02     | <0.01           | <0.01           |
|             | PFOA           | <0.001           | <0.01           | <0.01           |
| MW135       | PFOS           | <0.01 – 0.01     | 0.09            | <0.01           |
|             | PFOS and PFHxS | <0.01 – 0.01     | 0.20            | <0.01           |
|             | PFOA           | <0.001 – 0.003   | <0.01           | <0.01           |
| MW175       | PFOS           | <0.01 – 0.04     | <0.01           | <0.01           |
|             | PFOS and PFHxS | <0.01 – 0.06     | <0.01           | <0.01           |
|             | PFOA           | <0.01 – 0.01     | <0.01           | <0.01           |
| New Maximum |                | New Minimum      | New Exceedance  |                 |

**Note:**

**MW000** – multi-level monitoring well, the shallowest screen interval sample results have been used for the assessment.

#### 7.1.5.3 Off-site Central Drainage Channel

A single groundwater monitoring well (MW138) is in the Central Drainage Channel near the site boundary. The well reported saline (TDS of 29,243 mg/L), near neutral (pH of 7.39) conditions during the monitoring period. PFAS concentrations recorded during the November 2021 – October 2022 monitoring period were within the range of historical results.

A summary of the PFOA, PFOS and the sum of PFOS and PFHxS concentrations for the reporting period and the historical concentration ranges for the off-site Central Drainage area monitoring location is presented in Table 7-8.



Table 7-8 Central Drainage Channel Groundwater PFOA, PFOS and Sum of PFOS and PFHxS Concentrations

| Location ID | Analyte        | Historical range | OMP Monitoring  |                 |
|-------------|----------------|------------------|-----------------|-----------------|
|             |                | Min – Max (µg/L) | Nov 2021 (µg/L) | Jun 2022 (µg/L) |
| MW138       | PFOS           | <0.01 – 0.87     | 0.03            | 0.44            |
|             | PFOS and PFHxS | <0.01 – 1.01     | 0.03            | 0.54            |
|             | PFOA           | <0.01 – 0.02     | <0.01           | 0.02            |
| New Maximum |                | New Minimum      | New Exceedance  |                 |

**Note:**

**MW000** – multilevel monitoring well, the shallowest screen interval sample results have been used for the assessment.

#### 7.1.5.4 Off-site Southern Drainage Channel

Two groundwater monitoring wells (MW139 and MW140) are in the Southern Drainage Channel area. The wells reported saline (TDS 34,840 mg/L to 43,745 mg/L), near neutral (6.95 – 7.1 pH) conditions during the monitoring period.

No PFAS concentrations were recorded above the laboratory LOR during the monitoring period.

A summary of the PFOA, PFOS and the sum of PFOS and PFHxS concentrations for the monitoring period and the historical concentration ranges for the off-site Central Drainage Area monitoring location is presented in Table 7-9. . It is noted that majority of the results are below laboratory LOR and therefore the results have not been plotted

Table 7-9 Southern Drainage Channel Groundwater PFOA, PFOS and Sum of PFOS and PFHxS Concentrations

| Location ID | Analyte        | Historical range | OMP Monitoring  |                 |
|-------------|----------------|------------------|-----------------|-----------------|
|             |                | Min – Max (µg/L) | Nov 2021 (µg/L) | Jun 2022 (µg/L) |
| MW139       | PFOS           | <0.001– 0.01     | <0.01           | <0.01           |
|             | PFOS and PFHxS | <0.001– 0.04     | <0.01           | <0.01           |
|             | PFOA           | <0.001           | <0.01           | <0.01           |
| MW140       | PFOS           | <0.001 – 0.003   | <0.01           | <0.01           |
|             | PFOS and PFHxS | <0.001 – 0.003   | <0.01           | <0.01           |
|             | PFOA           | <0.01            | <0.01           | <0.01           |
| New Maximum |                | New Minimum      | New Exceedance  |                 |

**Note:**

**MW000** – multilevel monitoring well, the shallowest screen interval sample results have been used for the assessment.

### 7.1.6 Off-site receptors – WAPET Creek and Exmouth Gulf

Six groundwater monitoring wells are monitoring the receptor area east of WAPET Creek as displayed in Figure 3, Appendix A.

During the most recent monitoring event of the monitoring period (June 2022), the following conditions were recorded for the off-site area east of WAPET Creek:

- > Groundwater was saline across the area with TDS ranging from 34,905 mg/L (MW176) to 59,150 mg/L (MW177); and
- > Near neutral pH 6.95 (MW178) to 7.66 (MW141).

During the November 2021 – October 2022 monitoring period:

- > PFAS concentrations were recorded below the laboratory LOR at all locations, with exception of MW176 and MW177 in November 2021.
- > No detectable concentrations of PFOA were reported.
- > Detectable concentrations of PFOS (considered exceedances of the HEPA ecological criteria for 99% species protection) were recorded at 0.01 µg/L (MW176 and MW177).
- > Detectable concentrations for sum of PFOS and PFHxS were recorded at 0.01 µg/L (MW176 and MW177).
- > New maximum concentrations were recorded at MW176 and MW177 in November 2021 for PFOS and sum of PFOS and PFHxS (0.01 µg/L detected).

A summary of the PFOA, PFOS and the sum of PFOS and PFHxS concentrations for the monitoring period and the historical concentration ranges for the receptor area monitoring locations are presented in Table 7-10. It is noted that majority of the results are below laboratory LOR and therefore the results have not been plotted.

Table 7-10 Off-site receptor area Groundwater PFOA, PFOS and Sum of PFOS and PFHxS Concentrations

| Location ID | Analyte        | Historical range | OMP Monitoring  |                 |
|-------------|----------------|------------------|-----------------|-----------------|
|             |                | Min – Max (µg/L) | Nov 2021 (µg/L) | Jun 2022 (µg/L) |
| MW137       | PFOS           | <0.01 – 0.004    | <0.01           | <0.01           |
|             | PFOS and PFHxS | <0.01 – 0.011    | <0.01           | <0.01           |
|             | PFOA           | <0.01            | <0.01           | <0.01           |
| MW141       | PFOS           | <0.001 – 0.003   | <0.01           | <0.01           |
|             | PFOS and PFHxS | <0.001 - 0.003   | <0.01           | <0.01           |
|             | PFOA           | <0.001 - 0.002   | <0.01           | <0.01           |
| MW176       | PFOS           | <0.01 – 0.002    | 0.01            | <0.01           |
|             | PFOS and PFHxS | <0.01 – 0.002    | 0.01            | <0.01           |
|             | PFOA           | <0.001           | <0.01           | <0.01           |
| MW177       | PFOS           | <0.01 – 0.002    | 0.01            | <0.01           |
|             | PFOS and PFHxS | <0.01 – 0.003    | 0.01            | <0.01           |
|             | PFOA           | <0.001           | <0.01           | <0.01           |
| MW178       | PFOS           | <0.01 – 0.004    | <0.01           | <0.01           |
|             | PFOS and PFHxS | <0.01 – 0.008    | <0.01           | <0.01           |
|             | PFOA           | <0.001           | <0.01           | <0.01           |
| MW179       | PFOS           | <0.01 – 0.010    | <0.01           | <0.01           |
|             | PFOS and PFHxS | <0.01 – 0.019    | <0.01           | <0.01           |
|             | PFOA           | <0.01 – 0.001    | <0.01           | <0.01           |
| New Maximum |                | New Minimum      | New Exceedance  |                 |

**Note:**

**MW000** – multi-level monitoring well, the shallowest screen interval sample results have been used for the assessment.

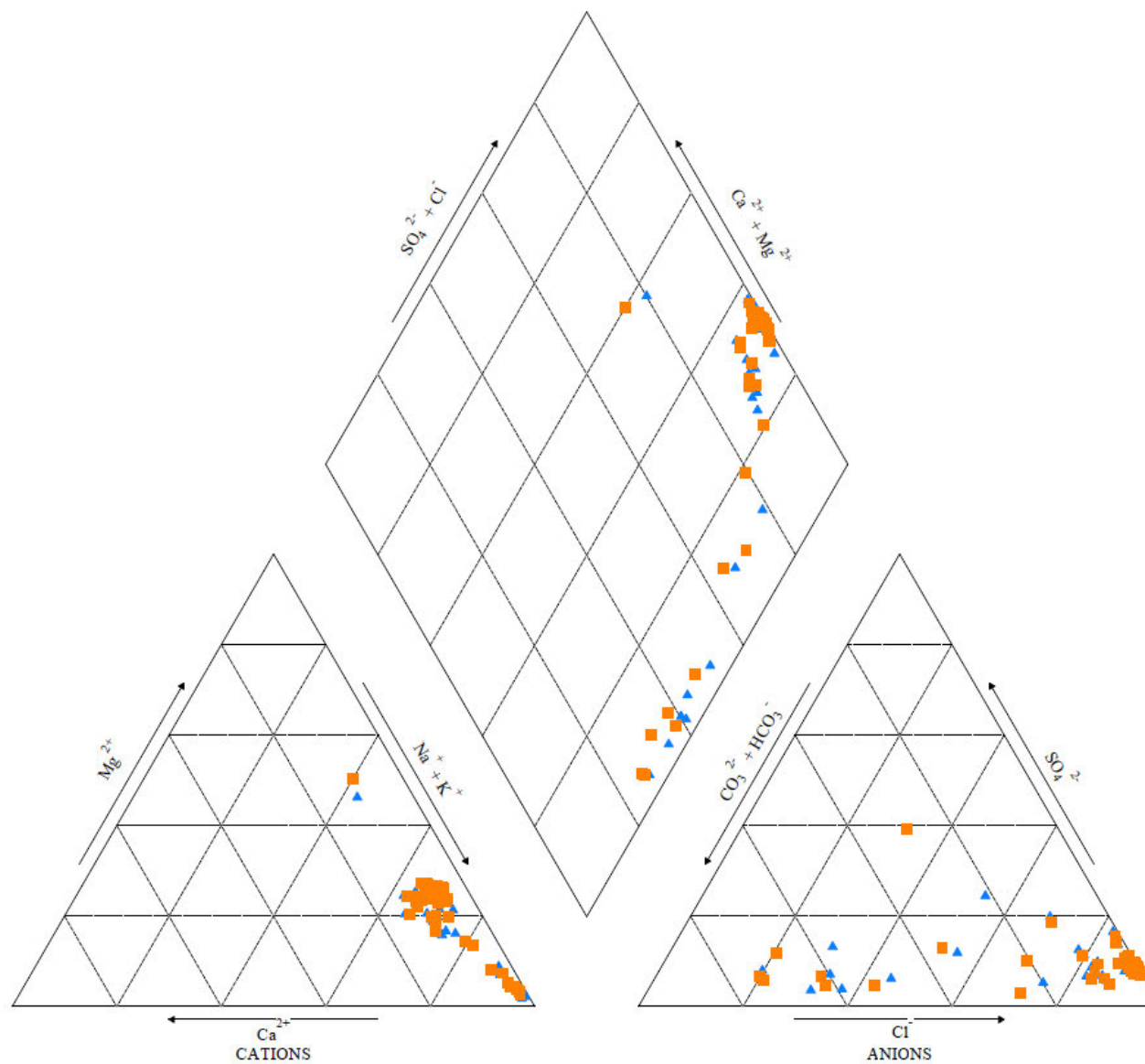
#### 7.1.7 Major Ions Analysis

Major ions analysis was conducted on the groundwater samples collected during each monitoring event to categorise the water type. The results of the major ion analysis are visually represented in a Piper Diagram shown in Figure 7-4. Most samples plotted as sodium-chloride type with a few samples being sodium-bicarbonate type. The high level of sodium is related to the saline environment. No significant difference in the hydrochemistry was observed between the two monitoring events/seasons or screen depths.

Figure 7-4 Piper diagram of the groundwater samples

LEGEND

- ▲ November 2021
- June 2022



## 7.2 Seepage Water

As part of the OMP, seepage water is sampled to assess the changes in PFAS concentrations at the receptor, downgradient of the identified source areas, including water discharged to the Exmouth Gulf. Seepage water samples were therefore collected during outgoing tidal cycles.

### 7.2.1 Seepage water geochemical parameters

Seepage water geochemical parameters recorded during the November 2021 and June 2022 monitoring events are summarised in Table 7-11 and provided within Table 4, Appendix D.

Table 7-11 Seepage water Geochemical Parameters

| Parameter | November 2021                                                   | June 2022                                                               |
|-----------|-----------------------------------------------------------------|-------------------------------------------------------------------------|
| DO        | 3.84 mg/L – 6.11 mg/L<br><i>Aerobic conditions.</i>             | 0.85 mg/L – 5.56 mg/L<br><i>Aerobic conditions.</i>                     |
| EC        | 56,496 µS/cm – 59,862 µS/cm<br><i>Highly Saline Conditions.</i> | 2,625 µS/cm – 54,880 µS/cm<br><i>Fresh to Highly Saline Conditions.</i> |
| pH        | 8.07 – 8.31<br><i>Slightly alkaline conditions.</i>             | 7.68 – 8.45<br><i>Slightly alkaline conditions.</i>                     |
| ORP       | 7.4 mV – 143 mV<br><i>Oxidising conditions.</i>                 | -77.7 mV – 63.6 mV<br><i>Reducing to oxidising conditions.</i>          |

### 7.2.2 Seepage Water Summary Results

A summary of the PFOA, PFOS and sum of PFOS and PFHxS concentrations for the monitoring period and the historical concentration ranges for the seepage water monitoring locations are presented in Table 7-12, the tabulated analytical results are provided in Table 1, Appendix D. It is noted that majority of the results are below laboratory LOR and therefore the results have not been plotted.

Seepage water has been sampled since February 2018 with detections of PFOS and the sum of PFOS and PFHxS recorded within isolated sampling locations during the November 2019 – October 2020 monitoring period, however, no detections of PFOA, PFOS or sum of PFOS and PFHxS were recorded at any of the monitoring locations during the November 2020 – October 2021 monitoring period (refer to the 2021 Annual Interpretive Report, Cardno, 2021). During this November 2021 – October 2022 monitoring period, PFOS and the sum of PFOS and PFHxS was reported at monitoring location OTH134. These results are not first-time detections, but new maximum concentrations for both analytes at this location.

Table 7-12 Seepage Water PFOA, PFOS and Sum of PFOS and PFHxS Concentrations

| Location ID | Analyte        | Historical range | OMP Monitoring  |                 |
|-------------|----------------|------------------|-----------------|-----------------|
|             |                | Min – Max (µg/L) | Nov 2021 (µg/L) | Jun 2022 (µg/L) |
| OTH103      | PFOS           | <0.001 – 0.14    | <0.01           | <0.01           |
|             | PFOS and PFHxS | <0.001 – 0.14    | <0.01           | <0.01           |
|             | PFOA           | <0.001           | <0.01           | <0.01           |
| OTH106      | PFOS           | <0.001 – 0.001   | <0.01           | <0.01           |
|             | PFOS and PFHxS | <0.001 – 0.001   | <0.01           | <0.01           |
|             | PFOA           | <0.001           | <0.01           | <0.01           |
| OTH107      | PFOS           | <0.001 - 0.01    | <0.01           | <0.01           |
|             | PFOS and PFHxS | <0.001 - 0.01    | <0.01           | <0.01           |
|             | PFOA           | <0.001           | <0.01           | <0.01           |
| OTH129      | PFOS           | <0.001 - 0.15    | <0.01           | <0.01           |
|             | PFOS and PFHxS | <0.001 - 0.15    | <0.01           | <0.01           |
|             | PFOA           | <0.001           | <0.01           | <0.01           |
| OTH132      | PFOS           | <0.001 - 0.01    | <0.01           | <0.01           |
|             | PFOS and PFHxS | <0.001 - 0.01    | <0.01           | <0.01           |
|             | PFOA           | <0.001           | <0.01           | <0.01           |
| OTH134      | PFOS           | <0.001 - 0.003   | <0.01           | 0.11            |
|             | PFOS and PFHxS | <0.001 - 0.003   | <0.01           | 0.13            |
|             | PFOA           | <0.001           | <0.01           | <0.01           |
| New Maximum |                | New Minimum      | New Exceedance  |                 |

## 7.3 Surface Water

The monitoring of surface water across the Management Area assesses the PFAS extent and changes in surface water migrating from the Base to WAPET Creek through the drainage channels.

Surface water has been sampled since February 2018. In addition, to the November 2021 and June 2022 biannual events a first flush event was also undertaken in May 2022. It is noted that several locations have not been regularly sampled due to being dry most of the time. All locations sampled for sediment/surface soil are also monitored for surface water and a sample is collected if surface water is present.

### 7.3.1 Surface water geochemical parameters

Surface water geochemical parameters recorded during the November 2021, May 2022 and June 2022 monitoring events are summarised in Table 7-13 and provided within Table 5, Appendix D.

Table 7-13 Surface water Geochemical Parameters

| Parameter | November 2021                                                       | May 2022                                                                | June 2022                                                               |
|-----------|---------------------------------------------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------|
| DO        | 3.09 mg/L – 5.56 mg/L<br><i>Aerobic conditions.</i>                 | 2.14 mg/L – 8.81 mg/L<br><i>Aerobic conditions.</i>                     | 1.28 mg/L – 7.89 mg/L<br><i>Aerobic conditions.</i>                     |
| EC        | 57,644 µS/cm – 95,529 µS/cm<br><i>Highly Saline Conditions.</i>     | 367.5 µS/cm – 60,054 µS/cm<br><i>Fresh to Highly Saline Conditions.</i> | 253.4 µS/cm – 90,882 µS/cm<br><i>Fresh to Highly Saline Conditions.</i> |
| pH        | 7.39 – 8.15<br><i>Near neutral to slightly alkaline conditions.</i> | 7.78 – 8.2<br><i>Slightly alkaline conditions.</i>                      | 7.49 – 9.15<br><i>Near neutral to slightly alkaline conditions.</i>     |
| ORP       | -18.3 mV – 129 mV<br><i>Reducing to oxidising conditions.</i>       | 60.3 mV – 207 mV<br><i>Oxidising conditions.</i>                        | -144.9 mV – 83.6 mV<br><i>Reducing to oxidising conditions.</i>         |

### 7.3.2 On-site pathway

The on-site surface water pathways are the on-site drains.

A summary of the PFOA, PFOS and sum of PFOS and PFHxS concentrations for the monitoring period and the historical concentration ranges for the on-site pathway area surface water monitoring locations are presented in Table 7-14. Tabulated analytical results are provided in Table 1, Appendix D. It is noted that several sample locations were dry, and many locations had concentrations recorded below the laboratory LOR; therefore, the results have not been plotted.

Detectable concentrations of PFOS and sum of PFOS and PFHxS were reported in all four surface water locations sampled during the monitoring period.

Surface water location SW265 reported a new maximum concentration for PFOS and sum of PFOS and PFHxS during the first flush event in May 2022. The location was subsequently sampled in June 2022 and reported significantly lower concentrations, within the historical range.

Surface water locations SW157 and SW170 were sampled for the first time in May 2022 and June 2022 and reported detectable concentrations of PFOS and sum of PFOS and PFHxS which are new exceedances of the Ecological assessment criteria.

Table 7-14 On-site pathway area Surface Water PFOA, PFOS and Sum of PFOS and PFHxS Concentrations

| Location ID | Analyte        | Historical range | OMP Monitoring  |                               |                 |
|-------------|----------------|------------------|-----------------|-------------------------------|-----------------|
|             |                | Min – Max (µg/L) | Nov 2021 (µg/L) | First Flush (May 2022) (µg/L) | Jun 2022 (µg/L) |
| SW114       | PFOS           | 0.081~           |                 |                               |                 |
|             | PFOS and PFHxS | 0.081~           | NS              | NS                            | NS              |
|             | PFOA           | <0.001~          |                 |                               |                 |
| SW121       | PFOS           | 0.18~            |                 |                               |                 |
|             | PFOS and PFHxS | 0.24~            | NS              | NS                            | NS              |
|             | PFOA           | 0.004~           |                 |                               |                 |
| SW122       | PFOS           | 1.3~             |                 |                               |                 |
|             | PFOS and PFHxS | 1.4~             | NS              | NS                            | NS              |
|             | PFOA           | 1.1~             |                 |                               |                 |
| SW123       | PFOS           | 0.43~            |                 |                               |                 |
|             | PFOS and PFHxS | 0.48~            | NS              | NS                            | NS              |
|             | PFOA           | 0.004~           |                 |                               |                 |
| SW219       | PFOS           | 0.002 - 0.34     |                 | 0.13                          |                 |
|             | PFOS and PFHxS | 0.002 – 0.38     | NS              | 0.13                          | NS              |
|             | PFOA           | <0.001 - <0.01   |                 | <0.01                         |                 |
| SW265       | PFOS           | 0.052 – 0.22     |                 | 1.11                          | 0.09            |
|             | PFOS and PFHxS | 0.052 – 0.22     | NS              | 1.13                          | 0.09            |
|             | PFOA           | <0.001           |                 | <0.01                         | <0.01           |
| SW157       | PFOS           | -                |                 | 0.07                          | 0.15            |
|             | PFOS and PFHxS | -                | NS              | 0.09                          | 0.15            |
|             | PFOA           | -                |                 | <0.01                         | <0.01           |
| SW170       | PFOS           | -                |                 | 0.16                          | 0.08            |
|             | PFOS and PFHxS | -                | NS              | 0.16                          | 0.08            |
|             | PFOA           | -                |                 | <0.01                         | <0.01           |
| New Maximum |                | New Minimum      | New Exceedance  |                               |                 |

**Notes:**

~ Historical data from June 2018 (only sampled once)

NS: Not Sampled – Refer to Section 3.6 for details

No historical data is available for SW157 and SW170 (previously dry locations)

### 7.3.3 Off-site pathways

The off-site pathway areas for surface water are identified as:

- > Northern Drainage Channel;
- > Central Drainage Channel; and
- > Southern Drainage Channel.

The surface water results for these areas are discussed in the following sections.

#### 7.3.3.1 Northern Drainage Channel

A summary of the PFOA, PFOS and sum of PFOS and PFHxS concentrations for the monitoring period and the historical concentration ranges for the off-site Northern Drainage Channel pathway area surface water monitoring locations are presented in Table 7-15. Tabulated analytical data is provided in Table 1, Appendix D. It is noted that a number of the sample locations were dry, or concentrations recorded below the laboratory LOR during OMP monitoring events and therefore the results have not been plotted.

Surface water sampling locations SW190 and SW192 were sampled for the first time in May 2022. Detectable concentrations of PFOS and sum of PFOS and PFHxS were reported during both monitoring events, with both PFOS detections being new guideline exceedances. The May 2022 results were first-time detections of PFOS and new exceedance of the Ecological guideline value for these monitoring locations.

New maximum concentrations for PFOS and sum of PFOS and PFHxS were reported at SW288, SW190 and SW192.

Table 7-15 Northern Drainage Channel Surface Water PFOA, PFOS and Sum of PFOS and PFHxS Concentrations

| Location ID | Analyte        | Historical range |                 | OMP Monitoring                |                 |
|-------------|----------------|------------------|-----------------|-------------------------------|-----------------|
|             |                | Min – Max (µg/L) | Nov 2020 (µg/L) | First Flush (May 2022) (µg/L) | Jun 2022 (µg/L) |
| SW189       | PFOS           | 0.04 – 0.45      | NS              | 0.44                          | 0.14            |
|             | PFOS and PFHxS | 0.04 – 0.45      |                 | 0.45                          | 0.14            |
|             | PFOA           | <0.01            |                 | <0.01                         | <0.01           |
| SW190       | PFOS           | -                | NS              | 0.26                          | 0.20            |
|             | PFOS and PFHxS | -                |                 | 0.27                          | 0.22            |
|             | PFOA           |                  |                 | <0.01                         | <0.01           |
| SW192       | PFOS           | -                | NS              | 0.07                          | 0.07            |
|             | PFOS and PFHxS | -                |                 | 0.16                          | 0.18            |
|             | PFOA           | -                |                 | <0.01                         | <0.01           |
| SW193       | PFOS           | <0.01 – 0.26     | NS              | 0.08                          | 0.18            |
|             | PFOS and PFHxS | <0.01 – 0.26     |                 | 0.08                          | 0.19            |
|             | PFOA           | <0.01            |                 | <0.01                         | <0.01           |
| SW288       | PFOS           | 0.10 - 0.11      | NS              | 0.02                          | 0.17            |
|             | PFOS and PFHxS | 0.10 - 0.11      |                 | 0.02                          | 0.19            |
|             | PFOA           | <0.001           |                 | <0.01                         | <0.01           |
| New Maximum |                | New Minimum      |                 | New Exceedance                |                 |

**Notes:**

NS: Not Sampled – Refer to Section 3.6 for details

SW190 has not been historically sampled for surface water (previously dry location).

#### 7.3.3.2 Central Drainage Channel

A summary of the PFOA, PFOS and sum of PFOS and PFHxS concentrations for the monitoring period and the historical concentration ranges for the off-site Central Drainage Channel pathway area surface water monitoring locations are presented in 0. Tabulated analytical data is provided in Table 1, Appendix D. SW227 was sampled for the first time in June 2022 and reported detectable concentrations of PFOS and



sum of PFOS and PFHxS. This first-time detection of PFOS was also a new exceedance of the Ecological guideline value.

Table 7-16 Central Drainage Channel Surface Water PFOA, PFOS and Sum of PFOS and PFHxS Concentrations

| Location ID | Analyte        | Historical range | OMP Monitoring  |                               |                 |
|-------------|----------------|------------------|-----------------|-------------------------------|-----------------|
|             |                | Min – Max (µg/L) | Nov 2021 (µg/L) | First Flush (May 2022) (µg/L) | Jun 2022 (µg/L) |
| SW291       | PFOS           | 0.038~           | NS              | NS                            | NS              |
|             | PFOS and PFHxS | 0.040~           |                 |                               |                 |
|             | PFOA           | <0.001~          |                 |                               |                 |
| SW293       | PFOS           | 0.050~           | NS              | NS                            | NS              |
|             | PFOS and PFHxS | 0.050~           |                 |                               |                 |
|             | PFOA           | <0.001~          |                 |                               |                 |
| SW227       | PFOS           | -                | NS              | NS                            | 0.11            |
|             | PFOS and PFHxS | -                |                 |                               | 0.11            |
|             | PFOA           | -                |                 |                               | <0.01           |
| New Maximum |                | New Minimum      |                 | New Exceedance                |                 |

**Notes:**

~ Historical data from June 2018 only

NS: Not Sampled – Refer to Section 3.6 for details

SW192 and SW227 have not been historically sampled for surface water (previously dry location).

### 7.3.3.3 Southern Drainage Channel

A summary of the PFOA, PFOS and sum of PFOS and PFHxS concentrations for the monitoring period and the historical concentration ranges for the off-site Southern Drainage Channel pathway area surface water monitoring locations are presented in 0. Tabulated analytical data is provided in Table 1, Appendix D. It is noted that a number of the sample locations were dry, or concentrations recorded below the laboratory LOR and therefore the results have not been plotted.

Table 7-17 Southern Drainage Channel Surface Water PFOA, PFOS and Sum of PFOS and PFHxS Concentrations

| Location ID | Analyte        | Historical range | OMP Monitoring  |                               |                 |
|-------------|----------------|------------------|-----------------|-------------------------------|-----------------|
|             |                | Min – Max (µg/L) | Nov 2021 (µg/L) | First Flush (May 2022) (µg/L) | Jun 2022 (µg/L) |
| SW199       | PFOS           | <0.01 – 0.04     | NS              | NS                            | <0.01           |
|             | PFOS and PFHxS | <0.01 – 0.04     |                 |                               | <0.01           |
|             | PFOA           | <0.01            |                 |                               | <0.01           |
| SW200       | PFOS           | <0.01 - 0.003    | NS              | NS                            | <0.01           |
|             | PFOS and PFHxS | <0.01 - 0.003    |                 |                               | <0.01           |
|             | PFOA           | <0.001 - <0.01   |                 |                               | <0.01           |
| SW298       | PFOS           | <0.01 - 0.005    | NS              | <0.01                         | <0.01           |
|             | PFOS and PFHxS | <0.01 - 0.005    |                 | <0.01                         | <0.01           |
|             | PFOA           | <0.001 - <0.01   |                 | <0.01                         | <0.01           |
| New Maximum |                | New Minimum      |                 | New Exceedance                |                 |

**Note:**

NS: Not Sampled – Refer to Section 3.6 for details

### 7.3.4 WAPET Creek receptor area

The WAPET Creek receptor area is divided into two areas:

- > WAPET Creek Northern Reach; and

> WAPET Creek Southern Reach.

The surface water results for these areas are discussed in the following sections.

7.3.4.1 *WAPET Creek Northern Reach receptor area*

A summary of the PFOA, PFOS and sum of PFOS and PFHxS concentrations for the monitoring period and the historical concentration ranges for the WAPET Creek Northern Reach receptor area surface water monitoring locations are presented in Table 7-18. Tabulated analytical data is provided in Table 1, Appendix D. It is noted that the monitoring locations predominantly recorded concentrations below the laboratory LOR during the monitoring events and therefore the results have not been plotted.

During the monitoring period all sampling locations reported concentrations below the laboratory LOR or detectable concentrations were within the historical range. No first-time detections, or new exceedance of a guideline value were reported during the November 2021 – October 2022 monitoring period.

Table 7-18 WAPET Creek Northern Reach Surface Water PFOA, PFOS and Sum of PFOS and PFHxS Concentrations

| Location ID | Analyte        | Historical range |                 | OMP Monitoring                |                 |
|-------------|----------------|------------------|-----------------|-------------------------------|-----------------|
|             |                | Min – Max (µg/L) | Nov 2021 (µg/L) | First Flush (May 2022) (µg/L) | Jun 2022 (µg/L) |
| SW001       | PFOS           | <0.01 – 0.01     | <0.01           | <0.01                         | <0.01           |
|             | PFOS and PFHxS | <0.01 – 0.01     | <0.01           | <0.01                         | <0.01           |
|             | PFOA           | <0.01            | <0.01           | <0.01                         | <0.01           |
| SW209       | PFOS           | <0.001 - 0.12    | <0.01           | <0.01                         | <0.01           |
|             | PFOS and PFHxS | <0.001 - 0.12    | <0.01           | <0.01                         | <0.01           |
|             | PFOA           | <0.001           | <0.01           | <0.01                         | <0.01           |
| SW210       | PFOS           | <0.001 - 0.06    | NS              | <0.01                         | 0.04            |
|             | PFOS and PFHxS | <0.001 - 0.06    |                 | <0.01                         | 0.04            |
|             | PFOA           | <0.001           |                 | <0.01                         | <0.01           |
| SW211       | PFOS           | <0.001 - 0.06    | <0.01           | <0.01                         | <0.01           |
|             | PFOS and PFHxS | <0.001 – 0.06    | <0.01           | <0.01                         | <0.01           |
|             | PFOA           | <0.001           | <0.01           | <0.01                         | <0.01           |
| SW300       | PFOS           | <0.001 - 0.02    | <0.01           | <0.01                         | 0.02            |
|             | PFOS and PFHxS | <0.001 - 0.02    | <0.01           | <0.01                         | 0.02            |
|             | PFOA           | <0.001           | <0.01           | <0.01                         | <0.01           |
| SW301       | PFOS           | <0.01 - 0.034    | <0.01           | <0.01                         | <0.01           |
|             | PFOS and PFHxS | <0.01 - 0.034    | <0.01           | <0.01                         | <0.01           |
|             | PFOA           | <0.001           | <0.01           | <0.01                         | <0.01           |
| SW302       | PFOS           | <0.01 - 0.22     | <0.01           | <0.01                         | 0.02            |
|             | PFOS and PFHxS | <0.01 - 0.22     | <0.01           | <0.01                         | 0.02            |
|             | PFOA           | <0.001           | <0.01           | <0.01                         | <0.01           |
| SW303       | PFOS           | <0.01 - 0.12     | <0.01           | <0.01                         | 0.02            |
|             | PFOS and PFHxS | <0.01 - 0.12     | <0.01           | <0.01                         | 0.02            |
|             | PFOA           | <0.001           | <0.01           | <0.01                         | <0.01           |
| SW304       | PFOS           | <0.01 - 0.17     | <0.01           | <0.01                         | <0.01           |
|             | PFOS and PFHxS | <0.01 - 0.18     | <0.01           | <0.01                         | <0.01           |
|             | PFOA           | <0.01 - 0.003    | <0.01           | <0.01                         | <0.01           |
| New Maximum |                | New Minimum      |                 | New Exceedance                |                 |

**Note:**

NS: Not Sampled – Refer to Section 3.6 for details

#### 7.3.4.2 WAPET Creek Southern Reach receptor area

A summary of the PFOA, PFOS and sum of PFOS and PFHxS concentrations for the monitoring period and the historical concentration ranges for the WAPET Creek Southern Reach receptor area surface water monitoring locations are presented in Table 7-19. Tabulated analytical data is provided in Table 1, Appendix D. It is noted that the sample locations recorded concentrations below the laboratory LOR during the monitoring events and therefore the results have not been plotted.

During the monitoring period all sampling locations recorded concentrations below the laboratory LOR.

Table 7-19 WAPET Creek Southern Reach Surface Water PFOA, PFOS and Sum of PFOS and PFHxS Concentrations

| Location ID | Analyte        | Historical range | OMP Monitoring  |                               |                 |
|-------------|----------------|------------------|-----------------|-------------------------------|-----------------|
|             |                | Min – Max (µg/L) | Nov 2021 (µg/L) | First Flush (May 2022) (µg/L) | Jun 2022 (µg/L) |
| SW205       | PFOS           | <0.001           | <0.01           | <0.01                         | <0.01           |
|             | PFOS and PFHxS | <0.001           | <0.01           | <0.01                         | <0.01           |
|             | PFOA           | <0.001           | <0.01           | <0.01                         | <0.01           |
| SW207       | PFOS           | <0.001 - 0.05    | <0.01           | <0.01                         | <0.01           |
|             | PFOS and PFHxS | <0.001 - 0.05    | <0.01           | <0.01                         | <0.01           |
|             | PFOA           | <0.001           | <0.01           | <0.01                         | <0.01           |
| SW208       | PFOS           | <0.001           | NS              | <0.01                         | <0.01           |
|             | PFOS and PFHxS | <0.001           |                 | <0.01                         | <0.01           |
|             | PFOA           | <0.001           |                 | <0.01                         | <0.01           |
| SW305       | PFOS           | <0.001 - 0.02    | <0.01           | <0.01                         | <0.01           |
|             | PFOS and PFHxS | <0.001 - 0.02    | <0.01           | <0.01                         | <0.01           |
|             | PFOA           | <0.001           | <0.01           | <0.01                         | <0.01           |
| New Maximum |                | New Minimum      | New Exceedance  |                               |                 |

**Note:**

NS: Not Sampled – Refer to Section 3.6 for details

## 7.4 Sediment/Surface Soil

The monitoring of sediment/surface soil across the Management Area assesses the PFAS extent and changes in surface water source areas migrating to WAPET Creek and assists in determining changes attributable to seasonal fluctuations. Sediment/surface soil has been sampled periodically since February 2018. In addition to the November 2021 and June 2022 biannual monitoring events, a first flush monitoring event was also undertaken in May 2022.

### 7.4.1 On-site pathway Area

The on-site pathway area for sediment/surface soil are the on-site drains.

A summary of the PFOA, PFOS and sum of PFOS and PFHxS concentrations for the reporting period and the historical concentration ranges for the on-site pathway area sediment/surface soil sampling locations are presented in Table 7-20. Tabulated analytical data is provided in Table 2, Appendix D.

New minimum and maximum concentrations were recorded in sediment/surface soil sampling locations across the on-site pathway area. Generally, the concentrations remained within the same order of magnitude as historical data, with exception of SS113 (May 2022) and SS265 (November 2021) which reported PFOS and sum of PFOS and PFHxS concentrations one standard deviation higher than the historical dataset. These were isolated occurrences as subsequent monitoring event(s) reported results within historical ranges.

Table 7-20 On-site pathway area Sediment/Surface Soil PFOA, PFOS and Sum of PFOS and PFHxS Concentrations

| Location ID | Analyte        | Historical range  | OMP Monitoring   |                                |                  |
|-------------|----------------|-------------------|------------------|--------------------------------|------------------|
|             |                | Min – Max (mg/kg) | Nov 2021 (mg/kg) | First Flush (May 2022) (mg/kg) | Jun 2022 (mg/kg) |
| SS108       | PFOS           | 0.0006 – 0.0135   | 0.0042           | 0.0066                         | 0.0207           |
|             | PFOS and PFHxS | 0.0006 – 0.0135   | 0.0042           | 0.0066                         | 0.0207           |
|             | PFOA           | <0.0001           | <0.0002          | <0.0002                        | <0.0002          |
| SS113       | PFOS           | 0.0002 – 0.0114   | 0.0064           | 0.1000                         | 0.0021           |
|             | PFOS and PFHxS | 0.0002 – 0.0114   | 0.0064           | 0.1000                         | 0.0021           |
|             | PFOA           | <0.0001           | <0.0002          | <0.0002                        | <0.0002          |
| SS114       | PFOS           | <0.0002 – 0.0390  | 0.0053           | 0.0062                         | 0.0265           |
|             | PFOS and PFHxS | <0.0002 – 0.0390  | 0.0053           | 0.0062                         | 0.0265           |
|             | PFOA           | <0.0001           | <0.0002          | <0.0002                        | <0.0002          |
| SS121       | PFOS           | 0.0187 – 0.8400   | 0.0268           | 0.0891                         | 0.0110           |
|             | PFOS and PFHxS | 0.0189 – 0.8400   | 0.0275           | 0.0896                         | 0.0110           |
|             | PFOA           | <0.0001 – 0.0022  | <0.0002          | <0.0002                        | <0.0002          |
| SS122       | PFOS           | 0.0056 – 0.0452   | 0.0150           | 0.0036                         | 0.0016           |
|             | PFOS and PFHxS | 0.0069 – 0.0452   | 0.0154           | 0.0045                         | 0.0021           |
|             | PFOA           | <0.0001 – 0.0004  | <0.0002          | <0.0002                        | <0.0002          |
| SS123       | PFOS           | 0.0344 – 0.1270   | 0.0323           | 0.0294                         | 0.0384           |
|             | PFOS and PFHxS | 0.0344 – 0.1270   | 0.0326           | 0.0299                         | 0.0387           |
|             | PFOA           | <0.0001           | <0.0002          | <0.0002                        | <0.0002          |
| SS124       | PFOS           | 0.0026 - 0.1880   | 0.2410           | 0.0022                         | 0.365            |
|             | PFOS and PFHxS | 0.003 - 0.1880    | 0.2410           | 0.0022                         | 0.365            |
|             | PFOA           | <0.0001 – 0.0004  | 0.0002           | <0.0002                        | <0.0002          |
| SS125       | PFOS           | 0.0024 - 0.1410   | 0.0020           | 0.0005                         | 0.0008           |
|             | PFOS and PFHxS | 0.0024 - 0.1410   | 0.0020           | 0.0005                         | 0.0008           |
|             | PFOA           | <0.0001           | <0.0002          | <0.0002                        | <0.0002          |
| SS157       | PFOS           | 0.0007 – 0.0322   | 0.0011           | 0.0022                         | 0.0075           |
|             | PFOS and PFHxS | 0.0007 – 0.0322   | 0.0011           | 0.0022                         | 0.0075           |
|             | PFOA           | <0.0002 - 0.0021  | <0.0002          | <0.0002                        | <0.0002          |
| SS166       | PFOS           | 0.0004 - 0.0022   | 0.0006           | 0.0019                         | 0.0013           |
|             | PFOS and PFHxS | 0.0004 - 0.0022   | 0.0006           | 0.0019                         | 0.0013           |
|             | PFOA           | <0.0001           | <0.0002          | <0.0002                        | <0.0002          |
| SS168       | PFOS           | 0.0005 - 0.0022   | 0.0004           | 0.0014                         | 0.0014           |
|             | PFOS and PFHxS | 0.0005 - 0.0022   | 0.0004           | 0.0014                         | 0.0014           |
|             | PFOA           | <0.0001           | <0.0002          | <0.0002                        | <0.0002          |
| SS170       | PFOS           | 0.0008 - 0.0052   | 0.0055           | 0.0033                         | 0.0055           |
|             | PFOS and PFHxS | 0.0008 - 0.0052   | 0.0055           | 0.0033                         | 0.0055           |
|             | PFOA           | <0.0001           | <0.0002          | <0.0002                        | <0.0002          |
| SS174       | PFOS           | 0.011 - 0.1540    | 0.2450           | 0.0285                         | 0.0047           |
|             | PFOS and PFHxS | 0.011 - 0.1550    | 0.2450           | 0.0285                         | 0.0047           |
|             | PFOA           | <0.0001           | <0.0002          | <0.0002                        | <0.0002          |
| SS176       | PFOS           | 0.0007 – 0.0135   | 0.0036           | 0.0243                         | 0.0005           |
|             | PFOS and PFHxS | 0.0007 – 0.0135   | 0.0036           | 0.0243                         | 0.0005           |
|             | PFOA           | <0.0001           | <0.0002          | <0.0002                        | <0.0002          |

| Location ID | Analyte        | Historical range  | OMP Monitoring   |                                |                  |
|-------------|----------------|-------------------|------------------|--------------------------------|------------------|
|             |                | Min – Max (mg/kg) | Nov 2021 (mg/kg) | First Flush (May 2022) (mg/kg) | Jun 2022 (mg/kg) |
| SD219       | PFOS           | 0.0001 - 0.0384   | 0.0009           | 0.0098                         | 0.0086           |
|             | PFOS and PFHxS | 0.0001 - 0.0384   | 0.0009           | 0.0098                         | 0.0086           |
|             | PFOA           | <0.0001           | <0.0002          | <0.0002                        | <0.0002          |
| SS231       | PFOS           | 0.0022 – 0.0832   | 0.0341           | 0.0135                         | 0.0044           |
|             | PFOS and PFHxS | 0.0024 – 0.0836   | 0.0341           | 0.0135                         | 0.0044           |
|             | PFOA           | <0.0001– 0.0004   | <0.0002          | <0.0002                        | <0.0002          |
| SS234       | PFOS           | 0.0082 – 0.0700   | 0.0443           | 0.0436                         | 0.0333           |
|             | PFOS and PFHxS | 0.0082 – 0.0700   | 0.0453           | 0.0436                         | 0.0345           |
|             | PFOA           | 0.0002 – 0.0014   | 0.0008           | 0.0003                         | 0.0003           |
| SS235       | PFOS           | 0.0004 – 0.0760   | 0.0159           | 0.0042                         | 0.0184           |
|             | PFOS and PFHxS | 0.0004 – 0.0760   | 0.0159           | 0.0042                         | 0.0184           |
|             | PFOA           | <0.0002 - 0.0005  | <0.0002          | <0.0002                        | <0.0002          |
| SS243       | PFOS           | 0.0051 – 0.0760   | 0.0075           | 0.0469                         | 0.0135           |
|             | PFOS and PFHxS | 0.0051 – 0.0760   | 0.0075           | 0.0042                         | 0.0135           |
|             | PFOA           | <0.0001           | <0.0002          | <0.0002                        | <0.0002          |
| SS265       | PFOS           | 0.0003 – 0.0076   | 0.0161           | 0.0003                         | 0.0012           |
|             | PFOS and PFHxS | 0.0003 – 0.0097   | 0.0165           | 0.0007                         | 0.0012           |
|             | PFOA           | <0.0001– 0.0003   | <0.0002          | <0.0002                        | <0.0002          |
| SS277       | PFOS           | 0.0012 – 0.0469   | 0.0703           | 0.0076                         | 0.0015           |
|             | PFOS and PFHxS | 0.0012 – 0.0469   | 0.0703           | 0.0076                         | 0.0015           |
|             | PFOA           | <0.0001           | <0.0002          | <0.0002                        | <0.0002          |
| SS278       | PFOS           | 0.0009 - 0.0494   | 0.0030           | 0.0007                         | 0.0003           |
|             | PFOS and PFHxS | 0.0009 - 0.0494   | 0.0030           | 0.0007                         | 0.0003           |
|             | PFOA           | <0.0001           | <0.0002          | <0.0002                        | <0.0002          |
| SS279       | PFOS           | 0.0003 - 0.0074   | 0.0038           | 0.0007                         | 0.0063           |
|             | PFOS and PFHxS | 0.0003 - 0.0086   | 0.0038           | 0.0007                         | 0.0063           |
|             | PFOA           | <0.0001           | <0.0002          | <0.0002                        | <0.0002          |
| New Maximum |                |                   | New Minimum      |                                |                  |

#### 7.4.2 Off-site pathway areas

The Off-site pathway areas for sediment/surface soil are identified as:

- > Northern Drainage Channel;
- > Central Drainage Channel; and
- > Southern Drainage Channel.

##### 7.4.2.1 Northern Drainage Channel

A summary of the PFOA, PFOS and sum of PFOS and PFHxS concentrations for the monitoring period and the historical concentration ranges for the Northern Drainage Channel sediment/surface soil sampling locations are presented in Table 7-21. Tabulated analytical data is provided in Table 2, Appendix D.

New maximum concentrations for PFOS and sum of PFOS and PFHxS were reported at SS192 and SS193 (within same order of magnitude as historical dataset).

Table 7-21 Northern Drainage Channel Sediment/Surface Soil PFOA, PFOS and Sum of PFOS and PFHxS Concentrations

| Location ID | Analyte        | Historical range  | OMP Monitoring   |                                |                  |
|-------------|----------------|-------------------|------------------|--------------------------------|------------------|
|             |                | Min – Max (mg/kg) | Nov 2021 (mg/kg) | First Flush (May 2022) (mg/kg) | Jun 2022 (mg/kg) |
| SS189       | PFOS           | 0.0003 – 0.0109   | 0.0102           | 0.0021                         | 0.0040           |
|             | PFOS and PFHxS | 0.0005 – 0.0111   | 0.0102           | 0.0021                         | 0.0040           |
|             | PFOA           | <0.0001 - 0.0003  | <0.0002          | <0.0002                        | <0.0002          |
| SS190       | PFOS           | 0.0019 - 0.0349   | 0.0110           | 0.0026                         | 0.0027           |
|             | PFOS and PFHxS | 0.0019 - 0.0355   | 0.0113           | 0.0026                         | 0.0027           |
|             | PFOA           | <0.0001           | <0.0002          | <0.0002                        | <0.0002          |
| SS192       | PFOS           | <0.0001 - 0.0004  | <0.0002          | 0.0038                         | 0.0046           |
|             | PFOS and PFHxS | <0.0001 - 0.0004  | <0.0002          | 0.0038                         | 0.0046           |
|             | PFOA           | <0.0001           | <0.0002          | <0.0002                        | <0.0002          |
| SS193       | PFOS           | <0.0002 – 0.0014  | 0.0002           | 0.0002                         | 0.0026           |
|             | PFOS and PFHxS | <0.0002 – 0.0021  | 0.0002           | 0.0002                         | 0.0026           |
|             | PFOA           | <0.0001           | <0.0002          | <0.0002                        | <0.0002          |
| SS288       | PFOS           | <0.0002 – 0.0274  | 0.0007           | 0.0034                         | 0.0014           |
|             | PFOS and PFHxS | <0.0002 – 0.0274  | 0.0007           | 0.0034                         | 0.0014           |
|             | PFOA           | <0.0001           | <0.0002          | <0.0002                        | <0.0002          |
| New Maximum |                | New Minimum       |                  |                                |                  |

#### 7.4.2.2 Central Drainage Channel

A summary of the PFOA, PFOS and sum of PFOS and PFHxS concentrations for the monitoring period and the historical concentration ranges for the Central Drainage Channel sediment/surface soil sampling locations are presented in 0. Tabulated analytical data is provided in Table 2, Appendix D. There were no new maximum concentrations reported during the monitoring period.

Table 7-22 Central Drainage Channel Sediment/Surface Soil PFOA, PFOS and Sum of PFOS and PFHxS Concentrations

| Location ID | Analyte        | Historical range  | OMP Monitoring   |                                |                  |
|-------------|----------------|-------------------|------------------|--------------------------------|------------------|
|             |                | Min – Max (mg/kg) | Nov 2021 (mg/kg) | First Flush (May 2022) (mg/kg) | Jun 2022 (mg/kg) |
| SS198       | PFOS           | <0.0002 – 0.0047  | 0.0035           | 0.0031                         | 0.0016           |
|             | PFOS and PFHxS | <0.0002 – 0.0047  | 0.0035           | 0.0031                         | 0.0016           |
|             | PFOA           | <0.0001           | <0.0002          | <0.0002                        | <0.0002          |
| SS291       | PFOS           | 0.0004 – 0.0101   | 0.0022           | 0.0022                         | 0.0022           |
|             | PFOS and PFHxS | 0.0004 – 0.0103   | 0.0022           | 0.0022                         | 0.0022           |
|             | PFOA           | <0.0001           | <0.0002          | <0.0002                        | <0.0002          |
| SS292       | PFOS           | <0.0002 – 0.0025  | 0.0020           | 0.0005                         | 0.0004           |
|             | PFOS and PFHxS | <0.0002 – 0.0025  | 0.0020           | 0.0005                         | 0.0004           |
|             | PFOA           | <0.0001           | <0.0002          | <0.0002                        | <0.0002          |
| SS293       | PFOS           | 0.0005 – 0.0106   | 0.0017           | 0.0005                         | 0.0035           |
|             | PFOS and PFHxS | 0.0005 – 0.0106   | 0.0017           | 0.0005                         | 0.0035           |
|             | PFOA           | <0.0001           | <0.0002          | <0.0002                        | <0.0002          |
| New Maximum |                | New Minimum       |                  |                                |                  |

#### 7.4.2.3 Southern Drainage Channel

A summary of the PFOA, PFOS and sum of PFOS and PFHxS concentrations for the monitoring period and the historical concentration ranges for the Southern Drainage Channel sediment / surface soil sampling locations are presented in 0. Tabulated analytical data is provided in Table 2, Appendix D. There were no new maximum concentrations reported during the monitoring period.

Table 7-23 Southern Drainage Channel Sediment/Surface Soil PFOA, PFOS and Sum of PFOS and PFHxS Concentrations

| Location ID | Analyte        | Historical range  | OMP Monitoring   |                                |                  |
|-------------|----------------|-------------------|------------------|--------------------------------|------------------|
|             |                | Min – Max (mg/kg) | Nov 2021 (mg/kg) | First Flush (May 2022) (mg/kg) | Jun 2022 (mg/kg) |
| SD199       | PFOS           | <0.0002 – 0.0013  | 0.0003           | <0.0002                        | <0.0002          |
|             | PFOS and PFHxS | <0.0002 – 0.0013  | 0.0003           | <0.0002                        | <0.0002          |
|             | PFOA           | <0.0001           | <0.0002          | <0.0002                        | <0.0002          |
| SD200       | PFOS           | <0.0001 - 0.0004  | NS               | <0.0002                        | <0.0002          |
|             | PFOS and PFHxS | <0.0001 - 0.0004  |                  | <0.0002                        | <0.0002          |
|             | PFOA           | <0.0001           |                  | <0.0002                        | <0.0002          |
| SS298       | PFOS           | <0.0001 – 0.0004  | <0.0002          | <0.0002                        | <0.0002          |
|             | PFOS and PFHxS | <0.0001 – 0.0004  | <0.0002          | <0.0002                        | <0.0002          |
|             | PFOA           | <0.0001           | <0.0002          | <0.0002                        | <0.0002          |
| New Maximum |                | New Minimum       |                  |                                |                  |

#### 7.4.3 WAPET Creek receptor area

The WAPET Creek receptor area is divided into two areas:

- > WAPET Creek Northern Reach; and
- > WAPET Creek Southern Reach.

The results for these areas are discussed in the following sections.

##### 7.4.3.1 WAPET Creek Northern Reach

A summary of the PFOA, PFOS and sum of PFOS and PFHxS concentrations for the monitoring period and the historical concentration ranges for the WAPET Creek Northern Reach sediment sampling locations are presented in 0. Tabulated analytical data is provided in Table 2, Appendix D. One new maximum concentration was reported during the June 2022 monitoring event at SD300 for PFOA, which is a first-time detection.

Table 7-24 WAPET Creek Northern Reach Sediment/Surface Soil PFOA, PFOS and Sum of PFOS and PFHxS Concentrations

| Location ID | Analyte        | Historical range  | OMP Monitoring   |                                |                  |
|-------------|----------------|-------------------|------------------|--------------------------------|------------------|
|             |                | Min – Max (mg/kg) | Nov 2021 (mg/kg) | First Flush (May 2022) (mg/kg) | Jun 2022 (mg/kg) |
| SD209       | PFOS           | <0.0001 – 0.0016  | <0.0002          | <0.0002                        | <0.0002          |
|             | PFOS and PFHxS | <0.0001 – 0.0016  | <0.0002          | <0.0002                        | <0.0002          |
|             | PFOA           | <0.0001           | <0.0002          | <0.0002                        | <0.0002          |
| SD210       | PFOS           | <0.0002 – 0.0016  | 0.0008           | 0.0010                         | 0.0011           |
|             | PFOS and PFHxS | <0.0002 – 0.0017  | 0.0008           | 0.0010                         | 0.0011           |
|             | PFOA           | <0.0001           | <0.0002          | <0.0002                        | <0.0002          |
| SD211       | PFOS           | <0.0002 – 0.0020  | 0.0007           | 0.0006                         | 0.0010           |
|             | PFOS and PFHxS | <0.0002 – 0.0020  | 0.0007           | 0.0006                         | 0.0010           |
|             | PFOA           | <0.0001           | <0.0002          | <0.0002                        | <0.0002          |
| SD301       | PFOS           | <0.0002 – 0.0018  | 0.0002           | 0.0003                         | <0.0002          |



| Location ID | Analyte        | Historical range  | OMP Monitoring   |                                |                  |
|-------------|----------------|-------------------|------------------|--------------------------------|------------------|
|             |                | Min – Max (mg/kg) | Nov 2021 (mg/kg) | First Flush (May 2022) (mg/kg) | Jun 2022 (mg/kg) |
| SD302       | PFOS and PFHxS | <0.0002 – 0.0018  | 0.0002           | 0.0003                         | <0.0002          |
|             | PFOA           | <0.0002           | <0.0002          | <0.0002                        | <0.0002          |
|             | PFOS           | <0.0001 - 0.0013  | <0.0002          | <0.0002                        | <0.0002          |
|             | PFOS and PFHxS | <0.0001 - 0.0013  | <0.0002          | <0.0002                        | <0.0002          |
|             | PFOA           | <0.0001           | <0.0002          | <0.0002                        | <0.0002          |
| SD303       | PFOS           | <0.0002           | 0.0003           | <0.0002                        | <0.0002          |
|             | PFOS and PFHxS | <0.0002           | 0.0003           | <0.0002                        | <0.0002          |
|             | PFOA           | <0.0002           | <0.0002          | <0.0002                        | <0.0002          |
| SD300       | PFOS           | <0.0001 - 0.0087  | 0.0004           | 0.0007                         | 0.0012           |
|             | PFOS and PFHxS | <0.0001 - 0.0087  | 0.0004           | 0.0007                         | 0.0034           |
|             | PFOA           | <0.0001           | <0.0002          | <0.0002                        | 0.0003           |
| New Maximum |                |                   | New Minimum      |                                |                  |

#### 7.4.3.2 WAPET Creek Southern Reach

A summary of the PFOA, PFOS and sum of PFOS and PFHxS concentrations for the monitoring period and the historical concentration ranges for the WAPET Creek Southern Reach sediment / surface soil sampling locations are presented in Table 7-25. Tabulated analytical data is provided in Table 2, Appendix D.

During the monitoring period all concentrations were recorded below the laboratory LOR.

Table 7-25 WAPET Creek Southern Reach Sediment/Surface Soil PFOA, PFOS and Sum of PFOS and PFHxS Concentrations

| Location ID | Analyte        | Historical range  | OMP Monitoring   |                                |                  |
|-------------|----------------|-------------------|------------------|--------------------------------|------------------|
|             |                | Min – Max (mg/kg) | Nov 2021 (mg/kg) | First Flush (May 2022) (mg/kg) | Jun 2022 (mg/kg) |
| SD205       | PFOS           | <0.0001           | <0.0002          | <0.0002                        | <0.0002          |
|             | PFOS and PFHxS | <0.0001           | <0.0002          | <0.0002                        | <0.0002          |
|             | PFOA           | <0.0001           | <0.0002          | <0.0002                        | <0.0002          |
| SD208       | PFOS           | <0.0001           | <0.0002          | <0.0002                        | <0.0002          |
|             | PFOS and PFHxS | <0.0001           | <0.0002          | <0.0002                        | <0.0002          |
|             | PFOA           | <0.0001           | <0.0002          | <0.0002                        | <0.0002          |
| SS301       | PFOS           | <0.0001           | <0.0002          | <0.0002                        | <0.0002          |
|             | PFOS and PFHxS | <0.0001           | <0.0002          | <0.0002                        | <0.0002          |
|             | PFOA           | <0.0001           | <0.0002          | <0.0002                        | <0.0002          |
| New Maximum |                |                   | New Minimum      |                                |                  |

## 8 Interpretive Analysis

This section provides a high-level interpretation of the nature and extent of PFAS at the Base based on the assessment of the data collected to date, supported by statistical analysis to evaluate whether changes have occurred to the understanding of the risk posed by PFAS in the Management Area.

### 8.1 Groundwater

All monitoring wells were gauged during both biannual monitoring events. Groundwater flow direction during the November 2021 monitoring event is predominantly towards the area of depression (to the east of the runway), whilst the June 2022 monitoring event indicated a less defined gradient towards the area of depression (Figures 5 and 6, Appendix A). The groundwater table was observed to be shallower during the June 2022 monitoring event (refer to Table 7-2). This can be related to groundwater recharge occurring via rainfall infiltration during the wet season (January – April) in the Exmouth area. These observations are consistent with the DSI (GHD, 2018) and 2021 AIR (Cardno, 2023).

A total of 49 monitoring wells were monitored for PFAS during the monitoring period. The findings are summarised in the following sections and the sum of PFOS and PFHxS, and PFOA results are displayed in (Appendix A):

- > Figures 7 and 10 for the November 2021 event; and
- > Figures 9 and 12 for the June 2022 event.

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

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

For practicality, GSI (2012) outlines that a "No trend" result can be considered as evidence that concentrations are neither increasing or decreasing at the relevant sampling location, similar to a "Stable" trend result.

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

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

#### 8.1.1 On-site Source Areas

Overall, the PFAS concentrations for the on-site source areas monitoring wells are consistent between each biannual monitoring event and historical recorded concentrations. The November 2021 – October 2022 monitoring data remained of the same order of magnitude as historical results at each monitoring well.

The highest PFAS concentrations were reported in the wells in Source Area 2. A number of wells across both source areas have consistently reported sum of PFOS and PFHxS concentrations above the HEPA (2020) recreational use criteria ( $2.0 \mu\text{g/L}$ ):

- > Source Area 1 – Maintenance Area – MW018, MW162, MW163, MW164, MW167, MW211 and MW233; and
- > Source Area 2 – Fuel Farm – MW148S, MW148D, MW238 and MW151.

All wells across Source Areas 1 and 2, with the exception of MW113, MW114 and MW165 (Source Area 1) and MW159 (Source Area 2), recorded PFOA concentrations above the laboratory LOR, but below adopted human health and ecological assessment criteria.

All PFOS concentrations recorded above the laboratory LOR are considered to exceed the HEPA (2020) 99% species protection level for fresh and marine water, as the criterion of 0.00023 µg/L is lower than the laboratory LOR. All wells across Source Areas 1 and 2 recorded concentrations above the LOR during the monitoring period with the exception of MW113, MW114 and MW159.

The PFAS concentrations at the source area monitoring wells appear relatively stable since the start of OMP implementation. New concentration maximums or minimums identified during the monitoring period are not showing evidence of a plume migration or depletion.

Mann Kendall analysis was undertaken to provide further evidence in regard to plume stability. As no seasonality is observed in the data, it is considered that the Mann-Kendall test is applicable. Mann Kendall analysis outputs are presented in Appendix D.

Potential trends for concentrations of PFOA, PFOS and the sum of PFOS and PFHxS in groundwater across Source Areas 1 and 2 are summarised in Table 8-1 with the associated confidence factor.

Table 8-1 Mann-Kendall Trend Analysis Summary – Source Areas 1 and 2

| Source Area   | Location | PFOA Trend          | Statistical Confidence <sup>(1)</sup> | PFOS Trend          | Statistical Confidence <sup>(1)</sup> | Sum of PFOS & PFHxS Trend | Statistical Confidence <sup>(1)</sup> |
|---------------|----------|---------------------|---------------------------------------|---------------------|---------------------------------------|---------------------------|---------------------------------------|
| Source Area 1 | MW018    | Increasing          | 97%                                   | No Trend            | 31%                                   | Stable                    | 29%                                   |
|               | MW021    | Increasing          | >99%                                  | Increasing          | >99%                                  | No Trend                  | 77%                                   |
|               | MW112    | No Trend            | 11%                                   | Stable              | <1%                                   | Stable                    | 55%                                   |
|               | MW113    | NA <sup>(2)</sup>   | NA <sup>(2)</sup>                     | Stable              | 81%                                   | Decreasing                | 95%                                   |
|               | MW114    | NA <sup>(2)</sup>   | NA <sup>(2)</sup>                     | Possibly Decreasing | 93%                                   | Stable                    | 90%                                   |
|               | MW115    | Possibly Increasing | 92%                                   | Increasing          | 99%                                   | Increasing                | 99%                                   |
|               | MW162    | Stable              | <1%                                   | No Trend            | 55%                                   | Stable                    | 45%                                   |
|               | MW163    | No Trend            | 12%                                   | Stable              | <1%                                   | Stable                    | <1%                                   |
|               | MW164    | Stable              | <1%                                   | No Trend            | 63%                                   | No Trend                  | 63%                                   |
|               | MW165    | Stable              | 79%                                   | No Trend            | 66%                                   | No Trend                  | 55%                                   |
|               | MW166    | Stable              | 71%                                   | No Trend            | 45%                                   | No Trend                  | <1%                                   |
|               | MW167    | Stable              | <1%                                   | No Trend            | 83%                                   | Possibly Increasing       | 93%                                   |
|               | MW168    | No Trend            | 39%                                   | Increasing          | 95%                                   | No Trend                  | 24%                                   |
|               | MW211    | Decreasing          | >99%                                  | Stable              | 89%                                   | Decreasing                | 98%                                   |
|               | MW233    | Stable              | 71%                                   | Stable              | 86%                                   | Possibly Decreasing       | 94%                                   |
| Source Area 2 | MW105    | Stable              | 78%                                   | No Trend            | 48%                                   | No Trend                  | 55%                                   |
|               | MW148S   | Possibly Increasing | 93%                                   | No Trend            | 77%                                   | No Trend                  | 64%                                   |
|               | MW148D   | No Trend            | 35%                                   | No Trend            | 63%                                   | No Trend                  | 24%                                   |
|               | MW151    | Stable              | 83%                                   | Stable              | 77%                                   | Stable                    | 87%                                   |
|               | MW159    | No trend            | <1%                                   | No Trend            | 53%                                   | No Trend                  | 68%                                   |

| Source Area | Location | PFOA Trend | Statistical Confidence <sup>(1)</sup> | PFOS Trend | Statistical Confidence <sup>(1)</sup> | Sum of PFOS & PFHxS Trend | Statistical Confidence <sup>(1)</sup> |
|-------------|----------|------------|---------------------------------------|------------|---------------------------------------|---------------------------|---------------------------------------|
|-------------|----------|------------|---------------------------------------|------------|---------------------------------------|---------------------------|---------------------------------------|

**Notes:**

- (1) the statistical confidence is the CF value. CF values greater than 95% indicate a strong trend, and CF values between 90% and 95% indicate a probably increasing/decreasing trend. Values below 90% indicate stable or no trend.
- (2) Trend Not Analysed – no detection above the laboratory LOR. Can be considered “stable” for the purpose of trend analysis.

The results of the Mann-Kendall trend analysis for PFOA indicate that the Source Area 1 plume displays a stable or no statistically significant trend in most wells. Increasing or possibly increasing trends were reported in three wells located in the downgradient part of the source area: MW018, MW021 and MW015. Source Area 2 also displays stable or no trends in most wells and a possibly increasing trend in MW148S. All four wells displaying increasing or probably increasing trends have reported concentrations within the same order of magnitude as the historical dataset.

The results of the Mann-Kendall trend analysis for PFOS indicates that the plume displays a predominantly stable or no statistically significant trend, with the exception of MW021, MW115 and MW168 within Source Area 1 which indicated increasing trends. However, MW114, also within Source Area 1 indicates a probably decreasing trend.

The results of the Mann-Kendall trend analysis for the sum of PFOS and PFHxS indicates that the plume displays a predominantly stable or no statistically significant trend, with the exception of MW115 within Source Area 1 that indicates an increasing trend and MW167 which indicates a possibly increasing trend. However, MW113 and MW211 within Source Area 1 indicates a decreasing trend and MW233 indicates a possibly decreasing trend.

Overall, the groundwater monitoring results do not suggest a change in the understanding of contamination or risk at these locations. A limited number of monitoring wells across the source areas are displaying either potential increasing or decreasing trends dependent on the analyte under review, which could indicate slight PFAS depletion/movement or leaching from contaminated soils at the source area.

### 8.1.2 Pathways and receptors

The 'pathways' and 'receptors' monitoring locations are the closest to the receiving environment and provide indications of potential PFAS plume migration and the exposure risk for the marine and other environments.

The PFAS concentrations for the off-site pathway and receptor monitoring wells are generally consistent between each biannual monitoring event and historical concentrations. The November 2021 – October 2022 monitoring data generally remained of the same order of magnitude as historical results at each monitoring well with the following exception.

- > Sum of PFOS and PFHxS was reported one order of magnitude above the historical range in November 2021 at MW135 in the northern drainage channel (0.2 µg/L compared to a historical maximum of 0.01 µg/L).

A number of samples have reported concentrations of PFOS occasionally above ecological assessment criteria (LOR) within the pathway area, and the sum of PFOS and PFHxS above the adopted human health (MW172 – on-site pathway). The highest PFAS concentrations in groundwater for the pathway areas were reported at MW172. It is however noted that this on-site monitoring location is relatively close to the source areas.

All receptor area monitoring wells recorded PFAS concentrations below the laboratory LOR during the reporting period, with exception of MW176 and MW177 which reported PFOS and sum of PFOS and PFHxS at 0.01 µg/L in November 2021. The concentrations were below the LOR in the following monitoring event (June 2022).

Plume stability (Mann Kendall analysis) has been calculated for each well that has sufficient temporal data (i.e. a minimum of four results). Groundwater monitoring data recorded between February 2018 and June 2022 was used for the assessment, with outputs presented in Appendix D. Groundwater concentration trends for PFOA, PFOS and the sum of PFOS and PFHxS across the pathway and receptor areas are summarised in Table 8-2.

Table 8-2 Mann-Kendall Trend Analysis Summary – Pathway and receptor areas

| Source Area | Location | PFOA Trend        | Statistical Confidence <sup>(1)</sup> | PFOS Trend        | Statistical Confidence <sup>(1)</sup> | Sum of PFOS & PFHxS Trend | Statistical Confidence <sup>(1)</sup> |
|-------------|----------|-------------------|---------------------------------------|-------------------|---------------------------------------|---------------------------|---------------------------------------|
| Pathway     | MW102    | NA <sup>(2)</sup> | NA <sup>(2)</sup>                     | No Trend          | <1%                                   | No Trend                  | <1%                                   |
|             | MW103    | No Trend          | <1%                                   | No Trend          | 12%                                   | No Trend                  | 63%                                   |
|             | MW104    | NA <sup>(2)</sup> | NA <sup>(2)</sup>                     | No Trend          | 72%                                   | No Trend                  | 83%                                   |
|             | MW122    | NA <sup>(2)</sup> | NA <sup>(2)</sup>                     | NA <sup>(2)</sup> | NA <sup>(2)</sup>                     | Stable                    | 79%                                   |
|             | MW124    | NA <sup>(2)</sup> | NA <sup>(2)</sup>                     | No trend          | 68%                                   | No Trend                  | 75%                                   |
|             | MW126    | NA <sup>(2)</sup> | NA <sup>(2)</sup>                     | No Trend          | 55%                                   | No Trend                  | 55%                                   |
|             | MW127    | NA <sup>(2)</sup> | NA <sup>(2)</sup>                     | NA <sup>(2)</sup> | NA <sup>(2)</sup>                     | NA <sup>(2)</sup>         | NA <sup>(2)</sup>                     |
|             | MW134    | NA <sup>(2)</sup> | NA <sup>(2)</sup>                     | No Trend          | <1%                                   | No Trend                  | <1%                                   |
|             | MW135    | Stable            | 81%                                   | No Trend          | 49%                                   | No Trend                  | 33%                                   |
|             | MW138    | No Trend          | 23%                                   | No Trend          | 73%                                   | No Trend                  | 68%                                   |
|             | MW139    | NA <sup>(2)</sup> | NA <sup>(2)</sup>                     | No Trend          | 34%                                   | No Trend                  | 34%                                   |
|             | MW140    | NA <sup>(2)</sup> | NA <sup>(2)</sup>                     | Stable            | 79%                                   | Stable                    | 79%                                   |
|             | MW143    | NA <sup>(2)</sup> | NA <sup>(2)</sup>                     | NA <sup>(2)</sup> | NA <sup>(2)</sup>                     | NA <sup>(2)</sup>         | NA <sup>(2)</sup>                     |
|             | MW144    | Stable            | 81%                                   | Stable            | 81%                                   | Stable                    | 81%                                   |
|             | MW145    | NA <sup>(2)</sup> | NA <sup>(2)</sup>                     | NA <sup>(2)</sup> | NA <sup>(2)</sup>                     | NA <sup>(2)</sup>         | NA <sup>(2)</sup>                     |
|             | MW146    | NA <sup>(2)</sup> | NA <sup>(2)</sup>                     | No Trend          | 62%                                   | No Trend                  | 62%                                   |
|             | MW147    | Stable            | 81%                                   | Stable            | 90%                                   | No Trend                  | 90%                                   |
|             | MW170    | No Trend          | 34%                                   | No Trend          | 68%                                   | No Trend                  | 83%                                   |
|             | MW172    | Stable            | 83%                                   | Stable            | 24%                                   | Possibly Decreasing       | 93%                                   |
|             | MW175    | No Trend          | 30%                                   | No Trend          | 36%                                   | No Trend                  | 36%                                   |
|             | MW180    | NA <sup>(2)</sup> | NA <sup>(2)</sup>                     | No Trend          | 20%                                   | No Trend                  | 75%                                   |
|             | MW181    | Stable            | 79%                                   | No Trend          | 20%                                   | No Trend                  | 75%                                   |
| Receptor    | MW137    | NA <sup>(2)</sup> | NA <sup>(2)</sup>                     | Stable            | 79%                                   | No Trend                  | 79%                                   |
|             | MW141    | Stable            | 81%                                   | Stable            | 81%                                   | Stable                    | 62%                                   |

| Source Area | Location | PFOA Trend        | Statistical Confidence <sup>(1)</sup> | PFOS Trend | Statistical Confidence <sup>(1)</sup> | Sum of PFOS & PFHxS Trend | Statistical Confidence <sup>(1)</sup> |
|-------------|----------|-------------------|---------------------------------------|------------|---------------------------------------|---------------------------|---------------------------------------|
|             | MW176    | NA <sup>(2)</sup> | NA <sup>(2)</sup>                     | No Trend   | <1%                                   | No Trend                  | <1%                                   |
|             | MW177    | NA <sup>(2)</sup> | NA <sup>(2)</sup>                     | No Trend   | <1%                                   | No Trend                  | <1%                                   |
|             | MW178    | NA <sup>(2)</sup> | NA <sup>(2)</sup>                     | Stable     | 79%                                   | No Trend                  | 79%                                   |
|             | MW179    | NA <sup>(2)</sup> | NA <sup>(2)</sup>                     | No Trend   | 79%                                   | No Trend                  | 79%                                   |

**Notes:**

- (1) the statistical confidence is the CF value. CF values greater than 95% indicate a strong trend, and CF values between 90% and 95% indicate a probably increasing/decreasing trend. Values below 90% indicate stable or no trend.
- (2) Trend Not Analysed – no detection above the laboratory LOR. Can be considered “stable” for the purpose of trend analysis.



The results of the Mann-Kendall trend analysis for PFOA, PFOS and the sum of PFOS and PFHxS indicates that the PFAS displays a potential stable or no statistically significant trend. A possibly decreasing trend was reported for sum of PFOS and PFHxS at MW172 (on-site pathway).

Overall, the groundwater monitoring results do not suggest a change in the understanding of PFAS extent or risk at the pathway and receptor locations. This is supported by the gauging data and inferred groundwater flow direction indicating a very low hydraulic gradient and limited flow/interaction from the Base to the Exmouth Gulf.

## 8.2 Seepage water

The monitoring of seepage water provides data to assess the potential risk to the Exmouth Gulf environment. The seepage water results for the monitoring period are depicted on Figures 7 and 9, Appendix A. Seepage water is groundwater that is moving to the surface (with groundwater flow and tide effect mechanisms). Monitoring of seepage water is conducted to identify PFAS movement (if any) and potential impact from impacted groundwater beneath the source areas, to downgradient receptors.

During this monitoring period, detectable PFOS and sum of PFOS and PFHxS concentrations were reported in one sample, OTH134 (located downgradient of the Source Area 2) in June 2022. The results (PFOS: 0.11 µg/L sum of PFOS and PFHxS: 0.13 µg/L) were new maximums for this location and were one order of magnitude greater than historical results. It is noted that this is not a first-time detection at this location. This could be a result of increased PFAS mobilisation with elevated rainfall followed by surface water infiltration.

PFAS concentrations above the LOR were only reported at one location (OTH134) during one of the two seepage water monitoring events, and while the concentration was a new maximum for this location, it was still significantly lower than the relevant recreational criteria (2 µg/ml). These results can also be related to the increased PFAS mobilisation with groundwater recharge during the wet season. Considering the dilution factor when reaching the Exmouth Gulf, it is considered that the potential risk remains low and acceptable. However, further monitoring of the PFOS and sum of PFOS and PFHxS concentrations at this location through the continuation of OMP is warranted.

## 8.3 Surface Water

There was low rainfall recorded during the month of the November 2021 monitoring event (10.4 mm) and high rainfall reported in the months of the first flush (62.4 mm) and June 2022 (104.4 mm) monitoring events.

Overall, the PFAS concentrations at surface water sampling locations are predominantly consistent with historically recorded concentrations, with the exception of one sampling location along the transport pathways (SW265).

It is noted that a number of sampling locations have not been sampled since 2018 due to the locations being consistently found dry.

The sum of PFOS and PFHxS and PFOA concentrations are displayed in (Appendix A):

- > Figures 7 and 10 for the November 2021 monitoring event;
- > Figures 8 and 11 for the 2022 first flush (May 2022) monitoring event; and
- > Figures 9 and 12 for the June 2022 monitoring event.

### 8.3.1 Pathway

Within the pathway areas there were new exceedance of the ecological assessment criteria (SW170 SW190, SW192, SW227) for PFOS, and maximum concentrations (SW265) for sum of PFOS and PFHxS recorded following the first flush monitoring event. There was no exceedance of the human health assessment criteria and no detection of PFOA in the pathway area during all three monitoring events.

The new ecological criteria exceedances for PFOS (LOR value adopted) were reported at three surface water locations that had not been sampled historically (SW170 and SW190 during the first flush monitoring event and SW227 during the June 2022 monitoring event). SW170 and SW190 reported PFOS and sum of PFOS and PFHxS concentrations above the LOR a second time in the June 2022 monitoring event, however concentrations were slightly lower than during the first flush monitoring event in May 2022. The relatively elevated rainfall events recorded between April 2022 and June 2022 and the first-time surface water flowing through three historically dry locations could have contributed to the PFAS mobilisation with surface water. The concentrations recorded were within expected range for the Northern drainage channel in comparison with other monitoring locations' historical range.

### 8.3.2 Receptor

PFAS concentrations in surface water samples across the receptor area were predominantly below the laboratory LOR during the monitoring period, except for:

- > SW210, SW300, SW302 and SW303 – WAPET Creek Northern Reach.

No new maximum concentrations or guideline exceedances were reported, and seasonal fluctuations were not observed in the field parameters or analytical data. Even though evidence of PFAS mobilisation with the elevated rainfall was observed in the pathway area, this wasn't reflected in the receptor area's results.

## 8.4 Sediment/Surface Soil

PFAS concentrations in sediment are monitored within the drainage channels (pathway areas on- and off-site) and receptor areas (northern and southern reaches of WAPET Creek) to provide an indication regarding the dispersion and accumulation of PFAS and potential associated direct and indirect exposure risk to receptors.

Sediment concentrations across the on-site pathway area were reported above the laboratory LOR, for at least one PFAS analyte, at all sampling locations during the monitoring period. New maximum concentrations were reported for a number of locations along the pathway areas, including SS108, SS113, SS124, SS170, SS174, SS176, SS265, SS277 along the on-site pathway and SS192 and SS193 along the northern drainage channel. All locations were within one order of magnitude of historical results with exception of SS192, SS265, SS174 and SS113. However, all of these locations, except for SS192, reported concentrations within historical ranges in the subsequent monitoring event(s). This is likely to be attributed to PFAS mobilisation with surface water related to elevated rainfall during the monitoring period.

PFAS concentrations within the receptor area were predominantly above the laboratory LOR except for SD209 in the northern reach and SD205, SD208 and SS301 in the southern reach of WAPET Creek, which were below the laboratory LOR. The PFAS concentrations detected in the northern reach of WAPET Creek are likely related to the wet season flooding events mobilising PFAS from the source areas, and PFAS dispersion with surface water.

It is considered that based on the current available data there is no significant change to the risk profile associated with sediments/surface soils within the Management Area, however ongoing monitoring of the sediment/surface soil locations is recommended given the evidence of PFAS mobilisation during above average rainfall events.

## 9 Conceptual Site Model

The evaluation of analytical results within this report does not suggest the nature and extent of PFAS in groundwater, surface water or sediment has significantly changed compared to that inferred from previous data despite the identified fluctuations in PFAS concentrations at individual locations. New maximum concentrations reported in surface water samples downstream of the fuel farm Source Area have been attributed to the increased rainfall experienced in April 2022 and June 2022, which resulted in surface water being present in three surface water monitoring locations along the drainage channel for the first time. This did not result in a concentration increase at down-gradient receptors as results remained within historical range at WAPET Creek surface water monitoring locations following the wet season (June 2022). The detection of PFAS in sediment samples indicates binding is occurring with sediment following transport with surface water. However, surface water presence in the pathway areas is only ephemeral and tends to pool and evaporate which limits PFAS migration.

The understanding of on-site source areas presented in the investigation phase (GHD, 2018) is supported by the OMP monitoring data presented in this report and previous OMP reports, with the PFAS concentrations in groundwater within the source areas remaining within the same order of magnitude as historical data. Increasing and possibly increasing trends observed at some source area groundwater wells confirm the source areas continue to act as sources of PFAS, likely due to PFAS leaching to groundwater from contaminated soil. The predominant stability in PFAS trends in groundwater within the pathway and receptor areas also suggest the risk profile of these locations do not appear to be changing significantly.

The pathways for PFAS exposure and risks to human health and ecological receptors presented in the investigation phase (GHD, 2018) and ERA (GHD, 2019) are considered to still be relevant and data presented in this report does not suggest any significant changes to these mechanisms or risks.

The variability in the data, and relatively low number of samples collected at some key locations to date (i.e. surface water in receptor areas), requires ongoing evaluation which will be completed through continuation of the OMP.

The data presented in this report does not significantly change the understanding of the conceptual site model (CSM) presented in the PMAP.

## 10 Discussion

### 10.1 Risk Profile

The outcomes of the ERA undertaken by GHD (GHD, 2019) determined that:

- > PFAS poses a low and acceptable risk to lower trophic level terrestrial and aquatic organisms across the Management Area;
- > PFAS poses a low and acceptable risk with respect to the potential for bioaccumulation and biomagnification in the food chain across the Management Area, including the on-site terrestrial environments, the adjacent saltpan, Exmouth Gulf and the southern reaches of the WAPET Creek; and
- > The PFAS concentrations estimated for fish and benthic fauna in the northern reaches of WAPET Creek marginally exceeded the NEMP avian wildlife diet guideline, designed to evaluate food chain PFAS exposure to bird species. Inherent in this guideline are a number of conservative exposure assumptions, therefore measurable and ecological relevant adverse effects to shorebird populations are considered unlikely to be associated with this exceedance. The weight of available evidence suggests that shorebirds could source a substantial portion of their diet within WAPET Creek with a low risk of chronic adverse PFOS exposures occurring.

It was concluded that the information gathered during the ERA supported the conclusion made in the DSI that PFAS poses a low risk to recreational anglers with respect to bioaccumulation in commonly caught fish species, and that PFAS was unlikely to harm prawn stocks with Exmouth Gulf or to bioaccumulate to potential harmful levels within the commercial prawn catch of the Exmouth Gulf Managed Prawn Fishery (EGMPF).

Based on the monitoring data collected as part of the OMP, there is no change to this risk profile, and any potential future changes in groundwater, surface water, seepage water and sediment PFAS concentrations will continue to be evaluated through monitoring and reporting in order to re-assess the risk as required.

The data obtained during the monitoring period has been reviewed against the management response triggers presented in the OMP. There was no exceedance of the management response triggers during the monitoring period.

### 10.2 Triggers for OMP Review

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

- > Policy changes, regulatory requirements or regulator advices;
- > Changes or refinements to the monitoring network, frequency and parameters;
- > Feedback and information received as part of stakeholder engagement activities;
- > A change in the understanding of the risk for the site;
- > Significant changes of land use within the Management Area or at close proximity;
- > Impacts of remediation works; and
- > The requirements of a post-remediation Site Management Plan.

The November 2021 – October 2022 monitoring results did not identify a change in the risk profile for the Management Area or further management actions that would trigger the need for an OMP review.

## 11 Conclusions

Groundwater, surface water, seepage water and sediment sampling were completed between November 2021 and October 2022 in accordance with the PMAP OMP and SAQP (Cardno, 2022). Available historical data was also used for this assessment. The monitoring conducted during the monitoring period has met the objectives of the OMP (refer to Section 1.2) and SAQP (Appendix B).

Overall, the concentrations of PFAS across the media and locations sampled are generally consistent and of the same order of magnitude as historical data. Potential increasing and decreasing trends were observed at individual monitoring locations targeting the source areas, noting that not all changes in PFAS concentrations were increases. This indicates the source areas continue to contribute to the PFAS load in groundwater though leaching from impacted soils. However the impact is also reducing in some locations for Source Area 1 (MW113, MW114, MW233). Mann Kendall trend analysis outcomes for the pathways and receptor areas indicated that there were potentially stable trends or no statistically significant trends.

The highest PFAS concentrations in groundwater were recorded at the Source Area 2 – Fuel Farm. However, there is no evidence of a change in PFAS movement towards off-site sensitive receptors even though the monitoring period recorded elevated rainfall. This is supported by the monitoring results and Mann Kendall analysis, the groundwater levels recorded and inferred groundwater flow direction.

Above average rainfall occurred during the November 2021 – October 2022 monitoring period which resulted in more surface water samples collected in comparison with previous monitoring years, including locations sampled for the first time. However, no new maximum concentrations or guideline exceedances were reported at downstream surface water monitoring locations targeting the receptor areas.

The nature and extent of PFAS across all media sampled has not changed from the understanding presented in the investigation phases, the PMAP and the 2020 and 2021 AIRs. Based on the current available data, there is no significant change to the risk profile of the Management Area.

No changes to the CSM understanding are noted and no changes to the management measures (i.e. ongoing monitoring) are recommended at this stage.

Given the remaining PFAS concentrations at the on-site source areas and increasing trends identified at some monitoring wells, the ongoing monitoring program should be continued to monitor the movement of PFAS over time and re-assess the risk profile as required.

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36. GHD, December 2018, *RAAF Base Learmonth – PFAS Investigations – Preliminary and Detailed Site Investigation Report.*
37. GHD, April 2019, *RAAF Base Learmonth – PFAS Investigations – Ecological Risk Assessment Preliminary (ERA).*
38. GHD, March 2020, *0960 RAAF Base Learmonth and 0961 Learmonth Air Weapons Range – Stage 2 Detailed Site Investigation.*



APPENDIX

A

FIGURES



now





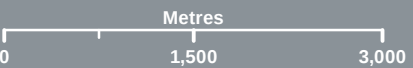


**Legend**

 Management Area

 RAAF Learmonth

FIGURE 1  
1:60,000 Scale at A3



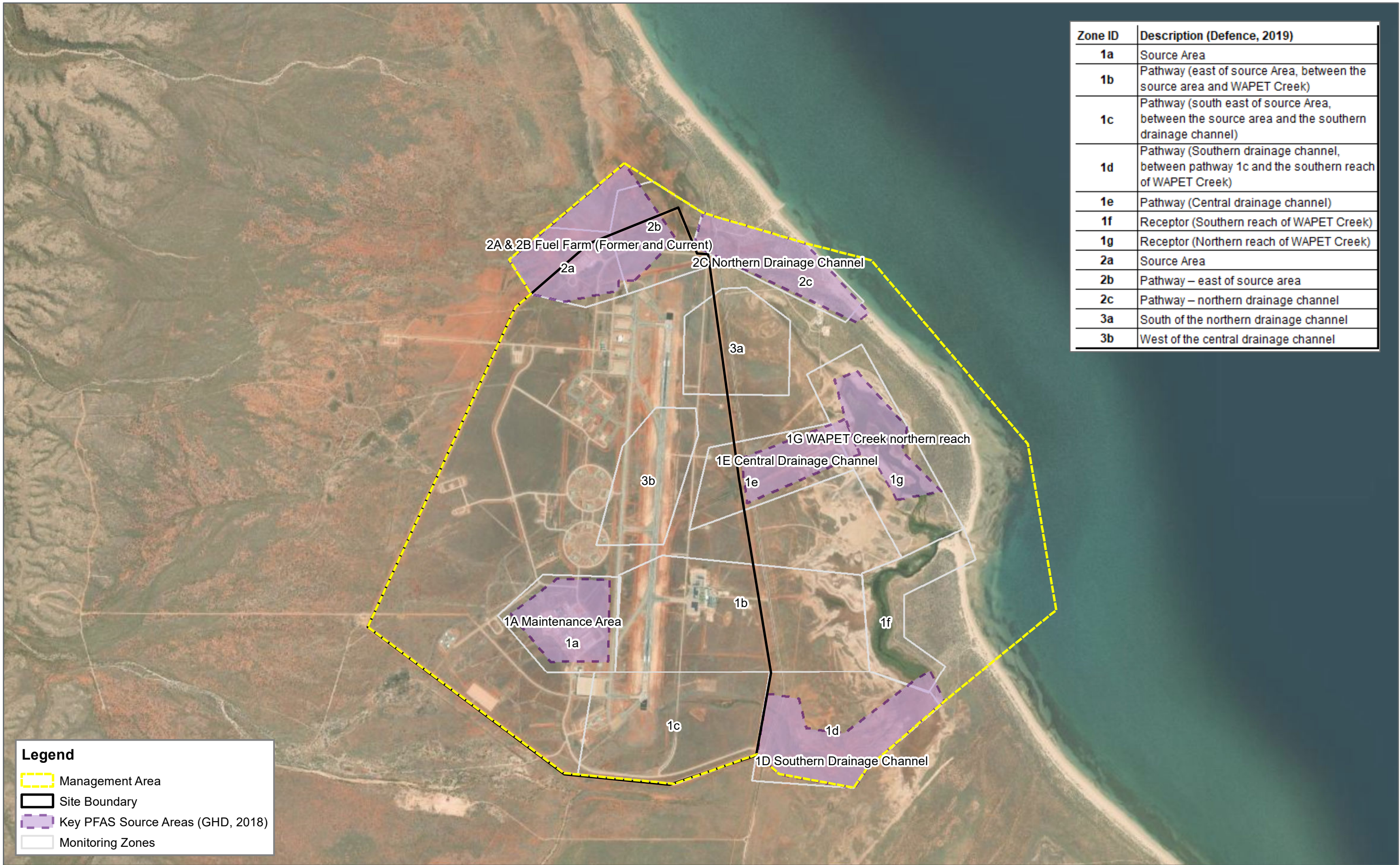
# Site Location

2022 ONGOING MONITORING REPORT  
RAAF BASE LEARMONTH  
DEPARTMENT OF DEFENCE



Map Produced by Cardno WA  
Date: 2023-03-08 | Project: DEF19009  
Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere  
Map: DEF19009\_WA\_0960-GS-001\_RegionalLocation 02.mxd  
Aerial Imagery Supplied by Google Earth





| Zone ID | Description (Defence, 2019)                                                                    |
|---------|------------------------------------------------------------------------------------------------|
| 1a      | Source Area                                                                                    |
| 1b      | Pathway (east of source Area, between the source area and WAPET Creek)                         |
| 1c      | Pathway (south east of source Area, between the source area and the southern drainage channel) |
| 1d      | Pathway (Southern drainage channel, between pathway 1c and the southern reach of WAPET Creek)  |
| 1e      | Pathway (Central drainage channel)                                                             |
| 1f      | Receptor (Southern reach of WAPET Creek)                                                       |
| 1g      | Receptor (Northern reach of WAPET Creek)                                                       |
| 2a      | Source Area                                                                                    |
| 2b      | Pathway – east of source area                                                                  |
| 2c      | Pathway – northern drainage channel                                                            |
| 3a      | South of the northern drainage channel                                                         |
| 3b      | West of the central drainage channel                                                           |

Legend

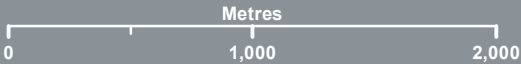
Management Area

Site Boundary

Key PFAS Source Areas (GHD, 2018)

Monitoring Zones

FIGURE 2  
1:31,000 Scale at A3



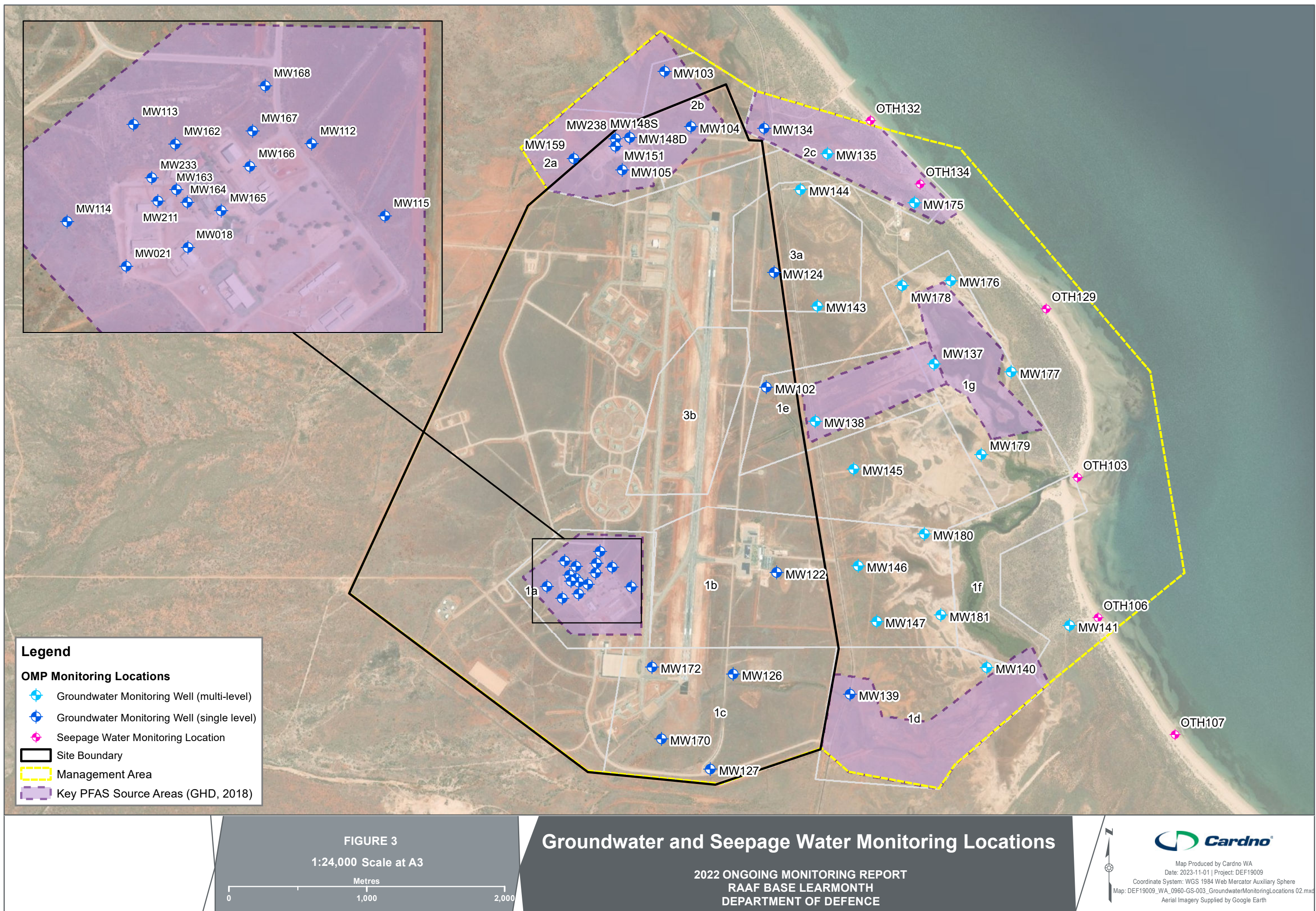
Management Areas & Monitoring Zones

2022 ONGOING MONITORING REPORT  
RAAF BASE LEARMONTH  
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA  
Date: 2023-11-01 | Project: DEF19009  
Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere  
Map: DEF19009\_WA\_0960-GS-002\_ManagementAreas 02.mxd  
Aerial Imagery Supplied by Google Earth















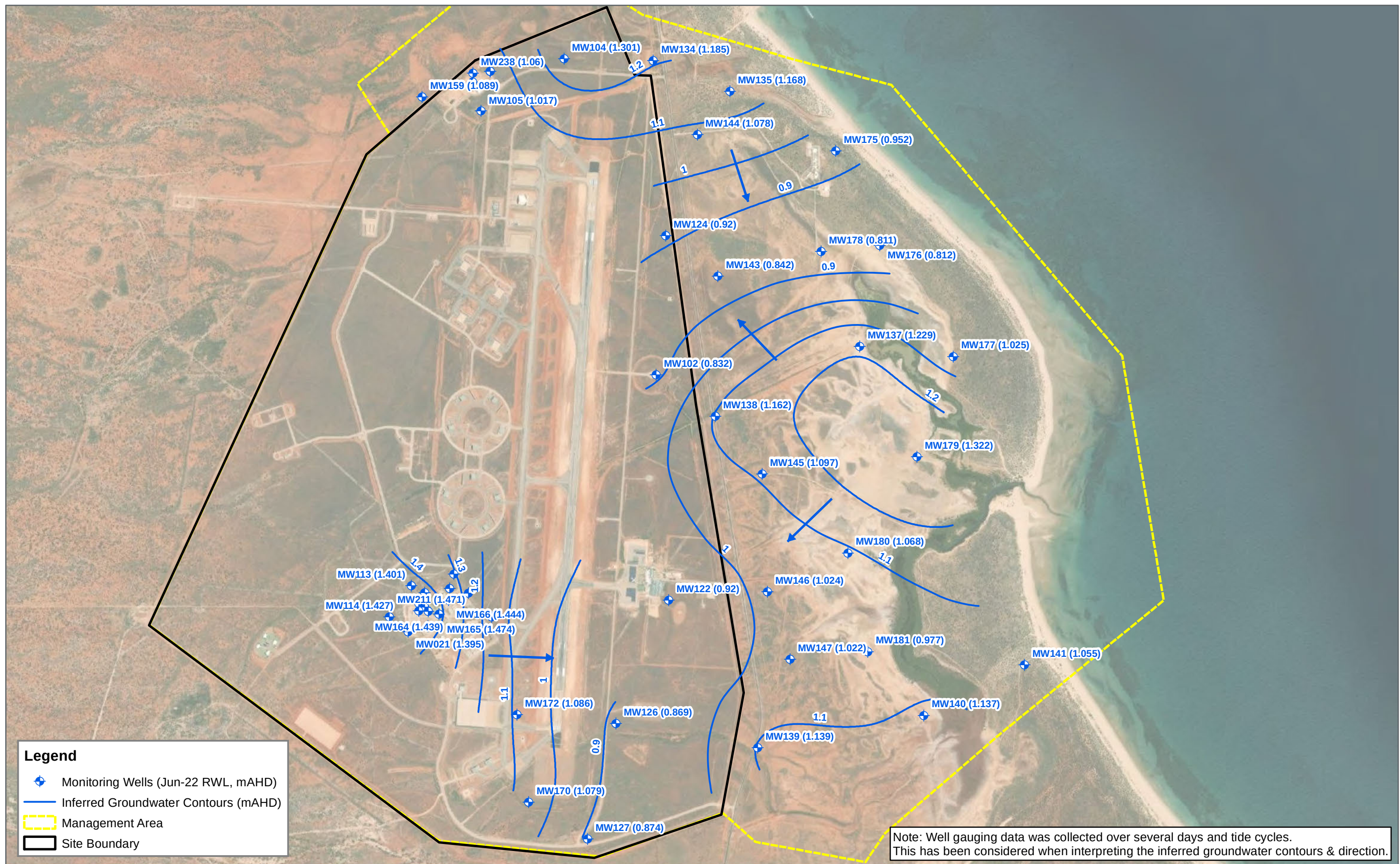


FIGURE 6  
1:21,000 Scale at A3

Metres  
0 500 1,000

## Inferred Groundwater Contours (Jun-22)

2022 ONGOING MONITORING REPORT  
RAAF BASE LEARMONTH  
DEPARTMENT OF DEFENCE



**Cardno**

Map Produced by Cardno WA  
Date: 2023-03-08 | Project: DEF19009  
Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere  
Map: DEF19009\_WA\_0960-GS-006\_Jun22GWContours 01.mxd  
Aerial Imagery Supplied by Google Earth



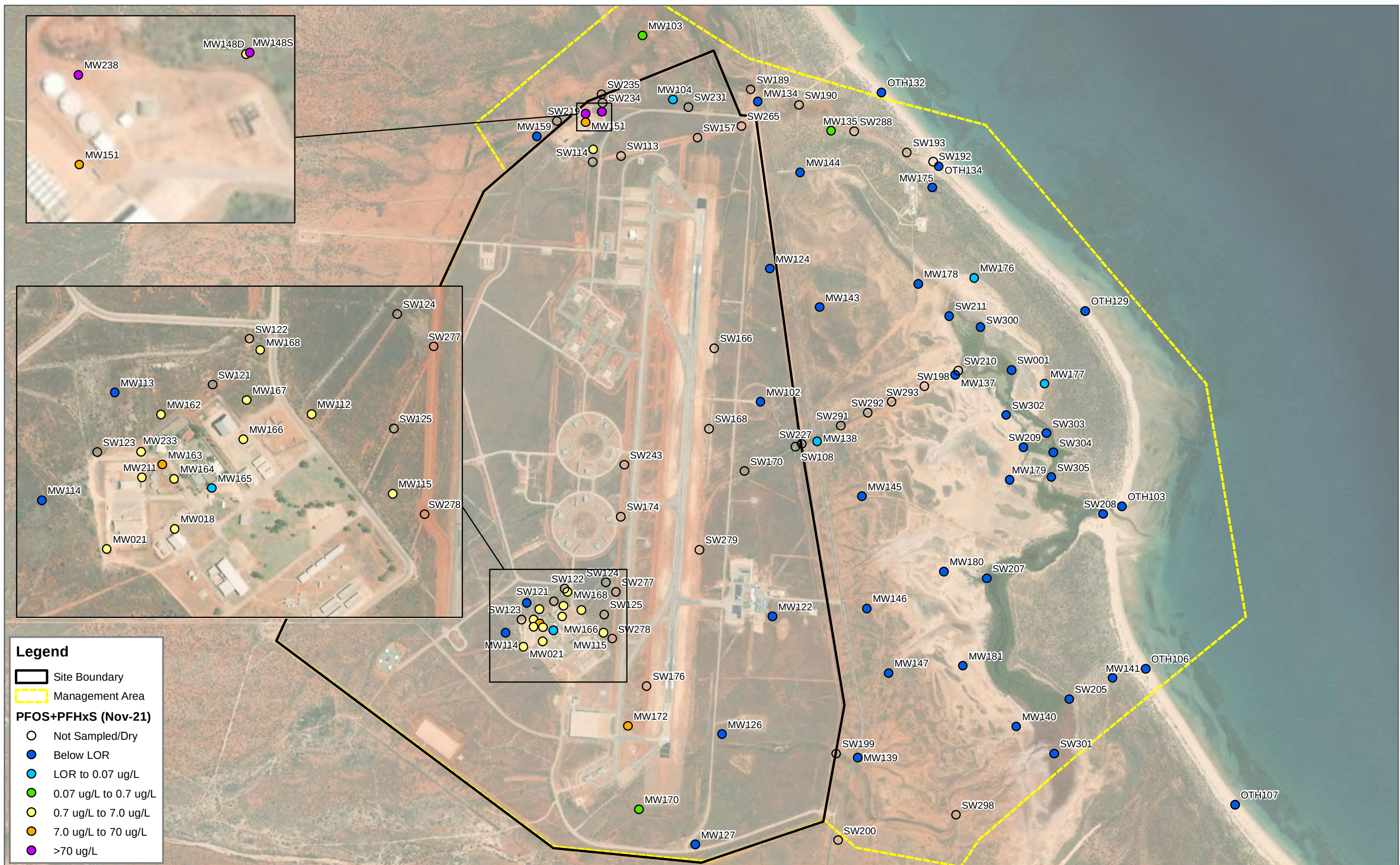


FIGURE 7  
1:22,000 Scale at A3

Metres

0 500 1,000

## PFOS+PFHxS concentrations (Nov-21)

2022 ONGOING MONITORING REPORT  
RAAF BASE LEARMONTH  
DEPARTMENT OF DEFENCE





FIGURE 8  
1:22,000 Scale at A3

Metres

0 500 1,000

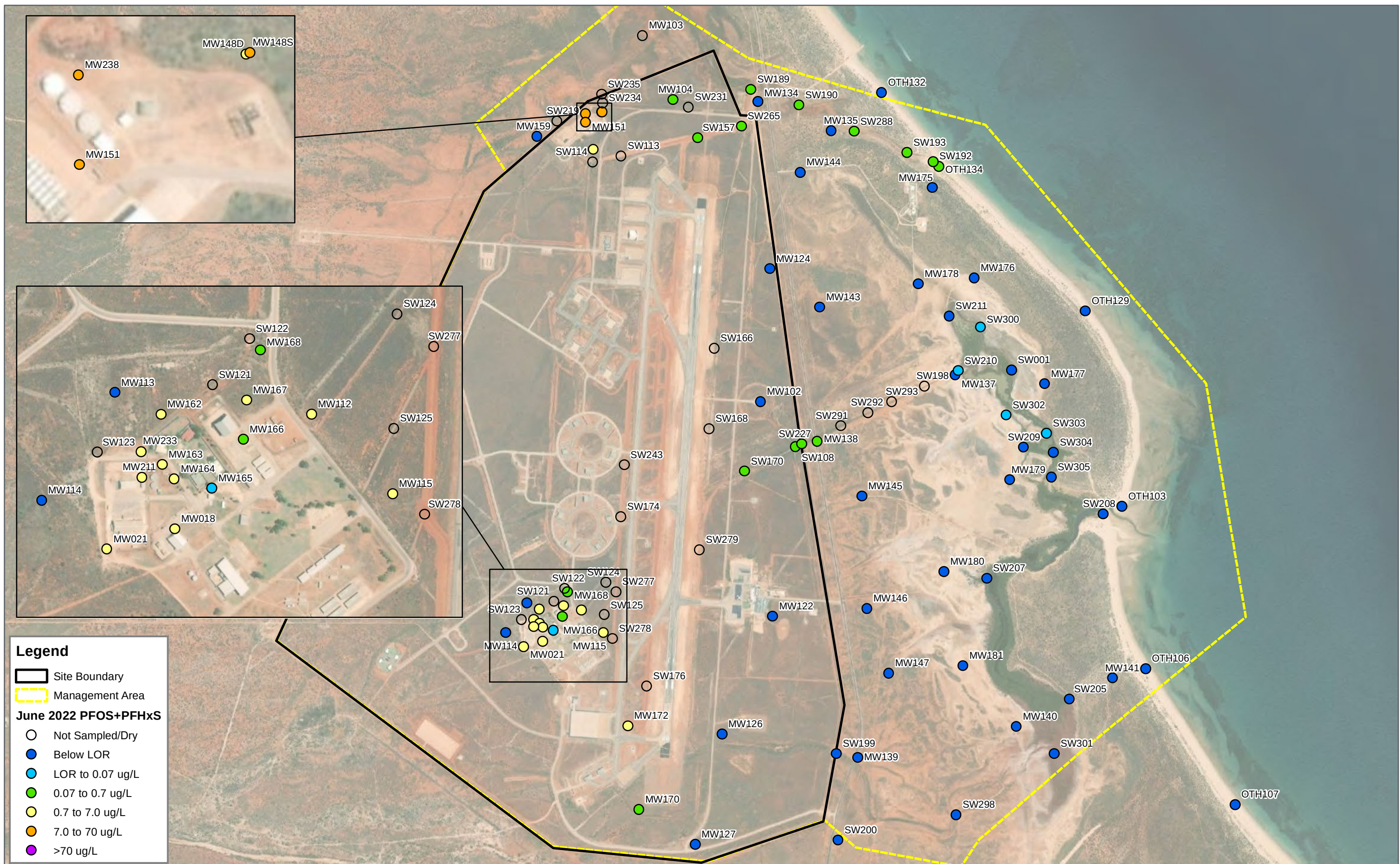
## PFOS+PFHxS concentrations (May22)

2022 ONGOING MONITORING REPORT  
RAAF BASE LEARMONTH  
DEPARTMENT OF DEFENCE



Map Produced by Cardno WA  
Date: 2023-04-06 | Project: DEF19009  
Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere  
Map: DEF19009\_WA\_0960-GS-008\_May22\_PFOS+PFHxS 01.mxd  
Aerial Imagery Supplied by Google Earth







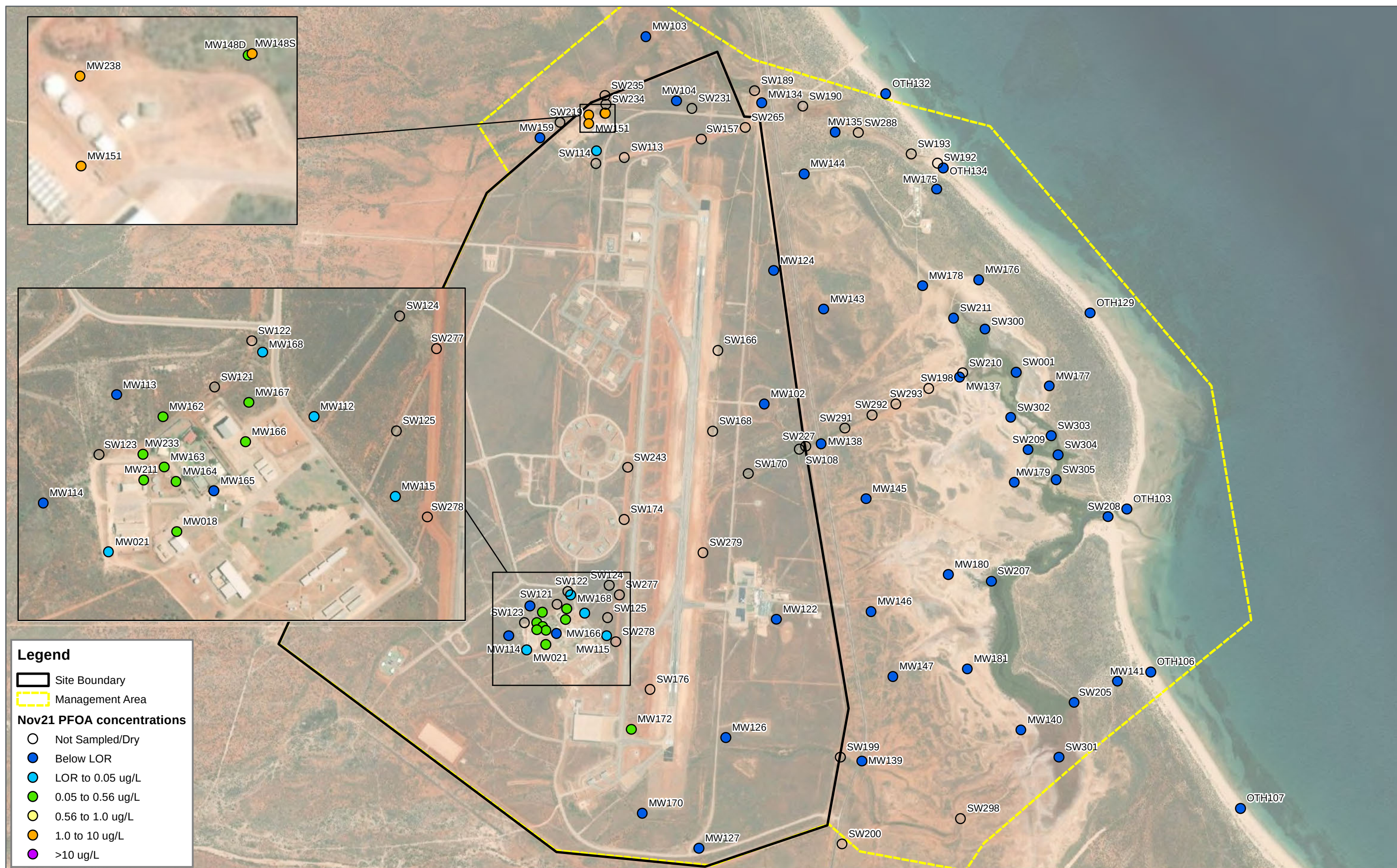


FIGURE 10  
1:22,000 Scale at A3

Metres  
0 500 1,000

## PFOA concentrations (Nov-21)

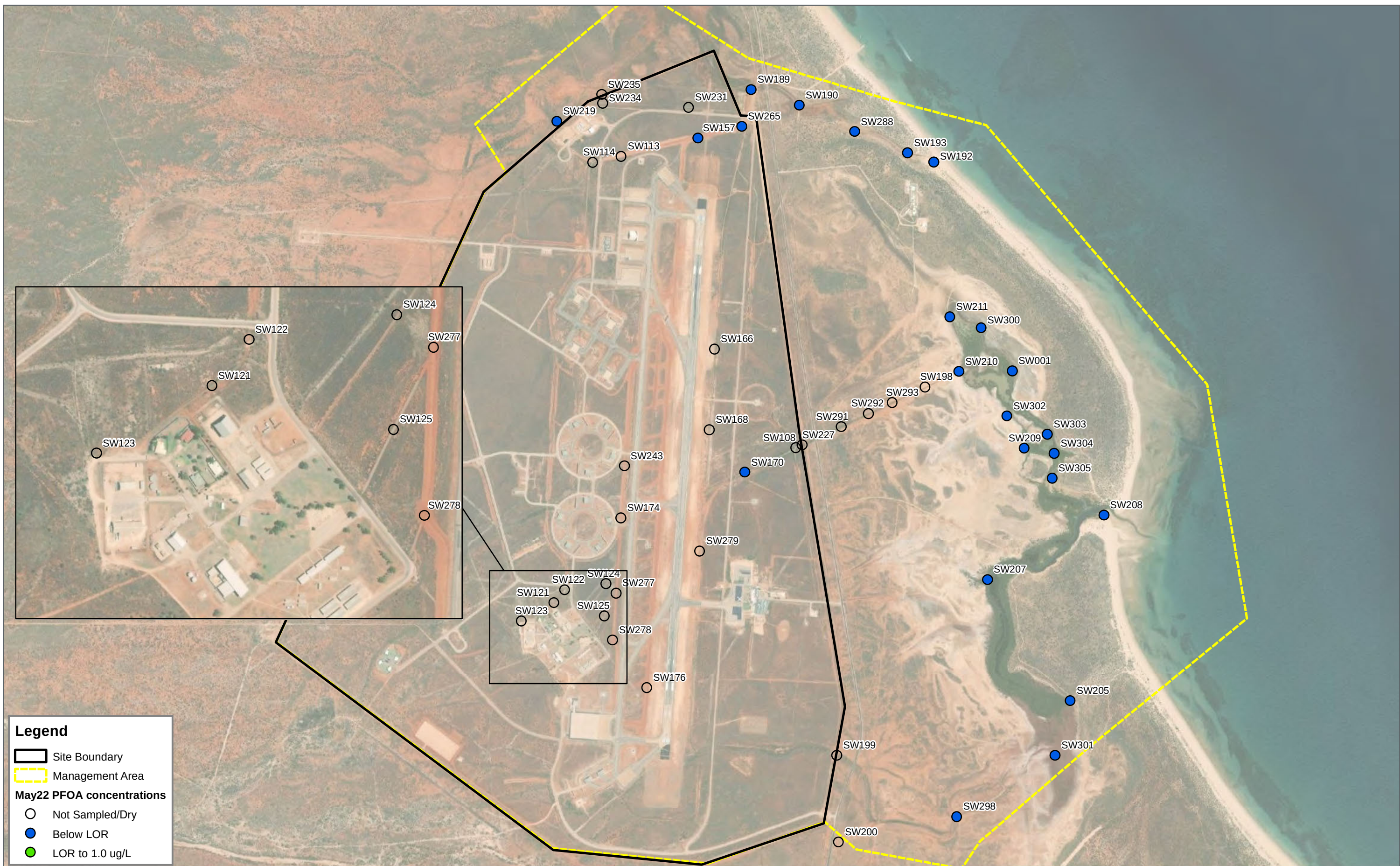
2022 ONGOING MONITORING REPORT  
RAAF BASE LEARMONTH  
DEPARTMENT OF DEFENCE



**Cardno**

Map Produced by Cardno WA  
Date: 2023-04-06 | Project: DEF19009  
Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere  
Map: DEF19009\_WA\_0960-GS-010\_Nov21\_PFOA 01.mxd  
Aerial Imagery Supplied by Google Earth





**Legend**

Site Boundary  
 Management Area  
**May22 PFOA concentrations**  
 Not Sampled/Dry  
 Below LOR  
 LOR to 1.0 ug/L

FIGURE 11  
1:22,000 Scale at A3

Metres

0 500 1,000

## PFOA concentrations (May22)

2022 ONGOING MONITORING REPORT  
RAAF BASE LEARMONTH  
DEPARTMENT OF DEFENCE



Map Produced by Cardno WA  
Date: 2023-04-06 | Project: DEF19009  
Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere  
Map: DEF19009\_WA\_0960-GS-011\_May22\_PFOA 01.mxd  
Aerial Imagery Supplied by Google Earth



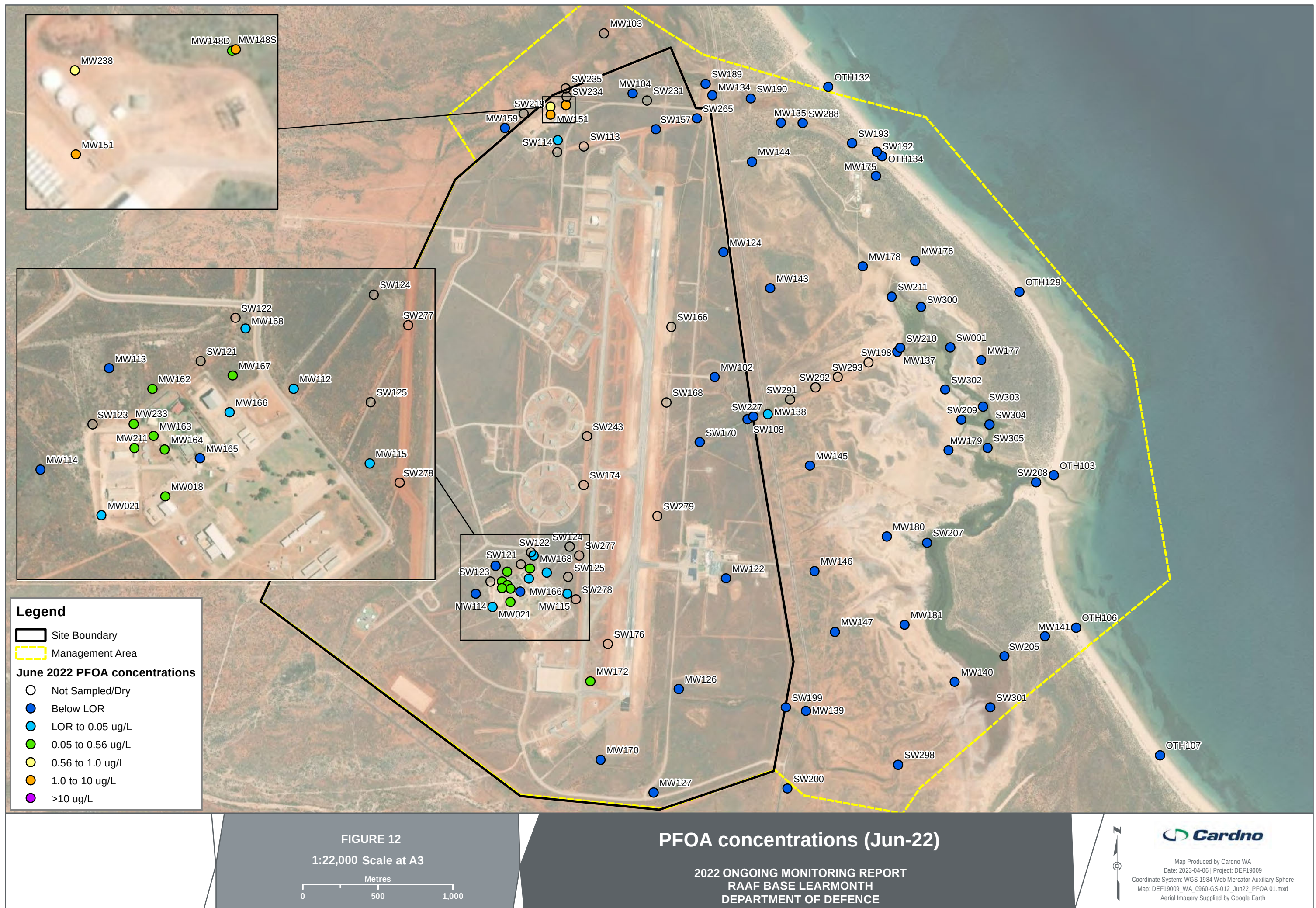






FIGURE 13  
1:22,000 Scale at A3

Metres

0 500 1,000

## Sediment PFOS+PFHxS concentrations (Nov-21)

2022 ONGOING MONITORING REPORT  
RAAF BASE LEARMONTH  
DEPARTMENT OF DEFENCE



Map Produced by Cardno WA  
Date: 2023-04-08 | Project: DEF19009  
Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere  
Map: DEF19009\_WA\_0960-GS-013\_Nov21\_SD 01.mxd  
Aerial Imagery Supplied by Google Earth





**Legend**

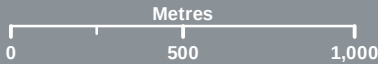
Site Boundary

Management Area

**May22 PFOS+PFHxS concentrations**

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

FIGURE 14  
1:22,000 Scale at A3



Sediment PFOS+PFHxS concentrations (May22)

2022 ONGOING MONITORING REPORT  
RAAF BASE LEARMONTH  
DEPARTMENT OF DEFENCE







**Legend**

Site Boundary  
 Management Area

**Jun22 PFOS+PFHxS concentrations**

○ Below LOR  
● LOR to 0.002 mg/kg  
● 0.002 to 0.02 mg/kg  
● 0.02 to 0.2 mg/kg  
● >0.2 mg/kg

FIGURE 15  
1:22,000 Scale at A3

Metres

0 500 1,000

## Sediment PFOS+PFHxS concentrations (Jun22)

2022 ONGOING MONITORING REPORT  
RAAF BASE LEARMONTH  
DEPARTMENT OF DEFENCE



Map Produced by Cardno WA  
Date: 2023-04-08 | Project: DEF19009  
Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere  
Map: DEF19009\_WA\_0960-GS-015\_Jun22\_SD 01.mxd  
Aerial Imagery Supplied by Google Earth



APPENDIX

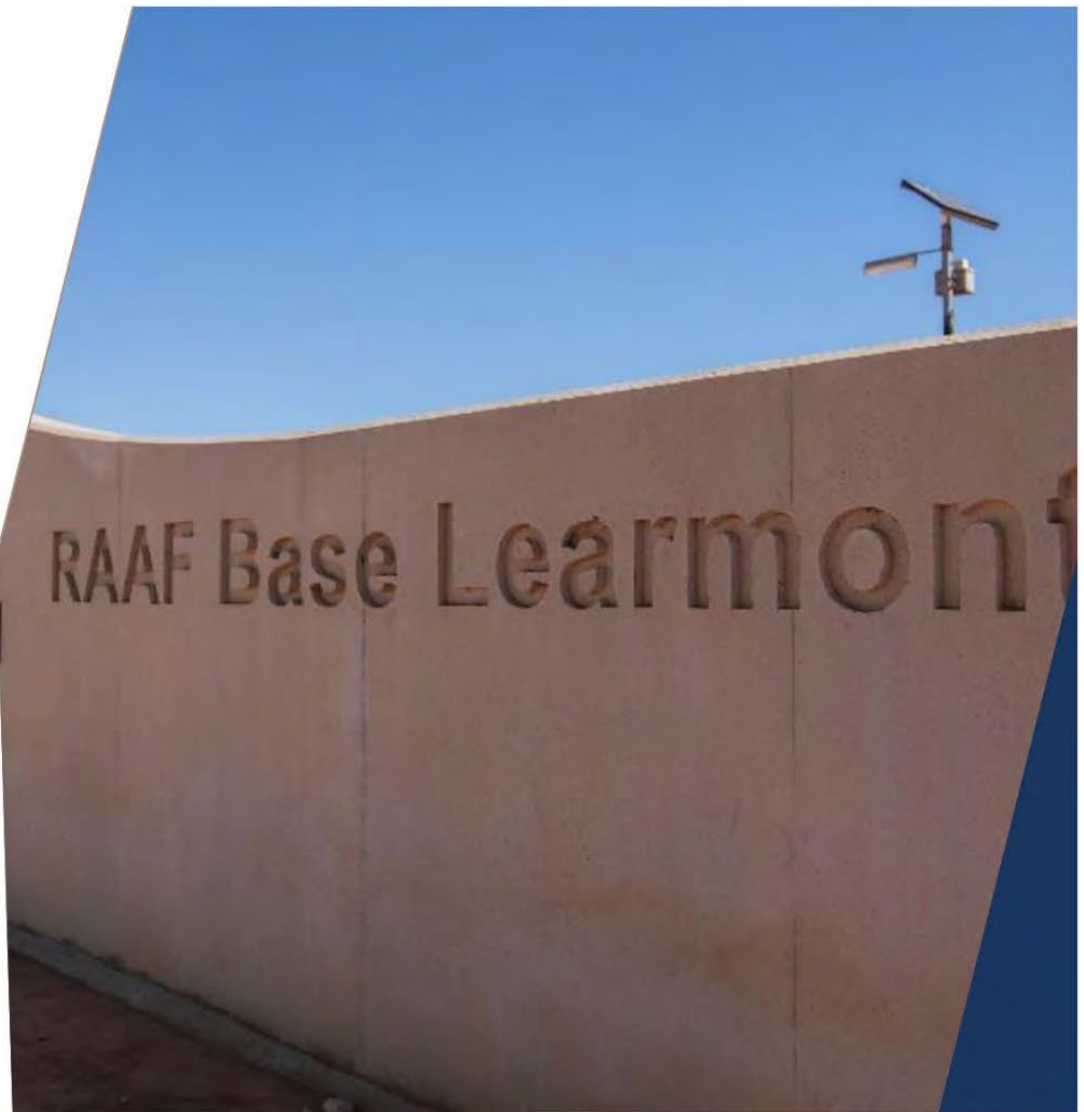
# B

SAQP



now





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

RAAF Base Learmonth

Prepared for  
Department of Defence

June 2022



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## Document Information

Prepared for Department of Defence

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Appendix A Figures

Appendix B Full PFAS Analytical Suite

# 1 Introduction

Cardno have been engaged by the Australian Department of Defence ('Defence' or 'Client') to prepare a Sampling and Analysis Quality Plan (SAQP) as part of the Ongoing Monitoring Plan (OMP), the purpose of which to monitor trends in the extent and concentrations of per- and poly-fluoroalkyl substances (PFAS) impacts identified on and around RAAF Base Learmonth, located approximately 30km south of Exmouth, Western Australia (Figure 1, Appendix A).

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

- > "the site" was defined as RAAF Base Learmonth (Figure 1, Appendix A).
- > "the Management Area" was defined as comprising the site, plus the land east of the Base, including the salt pan, drainage channels, WAPET creek and extends to Exmouth Gulf (Figure 2, Appendix A).

The site is located on Commonwealth Land and is regulated under Commonwealth environmental legislation. The OMP outlines the rationale and scope for the monitoring of the concentrations and extent of PFAS in groundwater, surface water and sediment originating from the site for an initial three-year monitoring period. The three-year monitoring period consists of two main sampling events in June and November, as well as a 'first flush' surface water and sediment monitoring event conducted immediately (or as close as possible) following the first heavy rainfall event of the wet season.

## 1.1 Purpose & Objectives

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

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

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

## 1.2 Previous Reports

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

- > Department of Defence, May 2019, RAAF Base Learmonth PFAS Management Area Plan, Revision 4.
- > Department of Defence, May 2019, RAAF Base Learmonth PFAS Ongoing Monitoring Plan.
- > GHD, December 2018, RAAF Base Learmonth – PFAS Investigations – Preliminary and Detailed Site Investigation Report.
- > GHD, April 2019, RAAF Base Learmonth – PFAS Investigations – Ecological Risk Assessment Preliminary (ERA).
- > Cardno, April 2020, PFAS OMP Biannual Monitoring Event Factual Report RAAF Base Learmonth
- > Cardno, May 2020, PFAS OMP First Flush Sampling Event Factual Report RAAF Learmonth
- > Cardno, December 2020, PFAS OMP 2020 post-summer Biannual Monitoring Event RAAF Base Learmonth.
- > Cardno, February 2021, PFAS OMP 2020 post-winter Biannual Monitoring Event RAAF Base Learmonth
- > Cardno, April 2021, PFAS OMP, DRAFT 2020 Annual Interpretive Report – RAAF Base Learmonth
- > Cardno, April 2021, PFAS OMP First Flush Sampling Event Factual Report RAAF Learmonth



- > Cardno, August 2021, PFAS OMP Biannual Monitoring Event Factual Report RAAF Learmonth
- > Cardno, April 2022, PFAS OMP Biannual Monitoring Event Factual Report RAAF Learmonth

### 1.3 Responsible Parties

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

**Table 1-1 Responsible Parties**

| Role                                                                                               | Responsibilities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Department of Defence – PFAS Investigation and Management Branch                                   | <ul style="list-style-type: none"> <li>▪ Implement this OMP.</li> <li>▪ Engage suitably qualified environmental consultants/contractors to carry out the works specified in the OMP</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| RAAF Base Learmonth – Base Support Manager/Site Manager and Environment and Sustainability Manager | <ul style="list-style-type: none"> <li>▪ Review and approve all necessary permits required for implementation of the works outlined in the OMP.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Environmental Consultant                                                                           | <ul style="list-style-type: none"> <li>▪ Obtain necessary permits from RAAF Base Learmonth to implement the works outlined in the OMP.</li> <li>▪ Liaise with State regulators (e.g. Department of Biodiversity, Conservation and Attractions) to arrange sampling of off-Site waterways, as required.</li> <li>▪ Undertake the monitoring activities outlined in this SAQP.</li> <li>▪ Produce a monitoring report that summarises the data and findings of each monitoring event and is consistent with the requirements of this SAQP.</li> <li>▪ Produce an annual interpretive report including recommendations for any potential changes in the location and frequency of sampling which may be incorporated in the revision of the OMP.</li> <li>▪ Upload analytical data from each monitoring event to the relevant Defence ESdat database.</li> </ul> |

### 1.4 Relevant Guidelines

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

- > National Environment Protection Council (NEPC), 1999, *National Environmental Protection (Assessment of Site Contamination) Measure (as amended 2013)* (ASC NEPM).
- > Heads of Environmental Protection Authority's Australia and New Zealand (HEPA), January 2020, *PFAS National Environmental Management Plan (NEMP) 2.0*.
- > Australian Standard AS 4482-2005 *Guide to the investigation and sampling of sites with potentially contaminated soils, Part 1 - Non-volatile and semi-volatile compounds*.
- > Standards Australia 1998. AS/NZ 5667:1998 *Water quality – sampling*.
- > Australian and New Zealand Guidelines, 2018. *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*.
- > Department of Defence, Department of Energy, 2018, *Quality System Manual Schedule B15*.
- > U.S. Environmental Protection Agency (EPA), 2000, 'Guidance for the Data Quality Objectives Process (EPA QA/G-4)'.
- > USEPA, 2002, 'Guidance on Environmental Data Verification and Data Validation (EPA QA/G-8)'.

- > Department of Water and Environmental and Regulation (DWER), 2021, *Assessment and Management of Contaminated Sites*<sup>1</sup>.
- > National Health and Medical Research Council (NHMRC), August 2019, *Guidance on Per and Polyfluoroalkyl Substances (PFAS) in Recreational Water*.

## 1.5 Standards of Assessment and Limitations

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

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

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

## 2 Site Description and Management Areas

RAAF Base Learmonth is located approximately 30 km South of Exmouth and covers an area of 2,550 hectares (ha).

The buildings and associated infrastructure and support services include:

- > Runway, taxi way and aprons
- > Aircraft hangers
- > Civilian Airport terminal
- > Maintenance and workshop areas
- > General administration
- > Domestic housing
- > Fuel farm (former and current)
- > Sewage treatment ponds
- > Base water bore-field
- > There are also a number of underground storage tanks (USTs) and septic tanks across the site.

### 2.1 Site Definition and Planning

For the purposes of this SAQP report, “the site” was defined as comprising RAAF Base Learmonth. A detailed description of the site is provided in GHD’s DSI Report (GHD, 2018). The site location is presented on Figure 1, Appendix A.

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

---

<sup>1</sup> It is noted that Site is located on Commonwealth Land and is regulated under the Commonwealth environmental legislation, the State based DWER guidelines are relevant for the sampling of off-Site waterways.

**Table 2-1 Site Identification Details**

| Details                                 | Description                               |
|-----------------------------------------|-------------------------------------------|
| <b>Site Address</b>                     | Minilya-Exmouth Road, Learmonth, WA 6707  |
| <b>Land Description</b>                 | RAAF Base Learmonth                       |
| <b>Owner</b>                            | Commonwealth of Australia                 |
| <b>Planning Zone / Land use</b>         | Public Purposes – Commonwealth Government |
| <b>Local Government Authority (LGA)</b> | Shire of Exmouth                          |

## 2.2 Surrounding Land Uses and Zoning

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

**Table 2-2 Surrounding Land Uses**

| Direction    | Land Use                                                                                          |
|--------------|---------------------------------------------------------------------------------------------------|
| <b>North</b> | Kailis Hatchery, Potshot Memorial and pastoral land                                               |
| <b>West</b>  | WAPET Creek, Solar Observatory, Bureau of Meteorology, Cape Range National Park and pastoral land |
| <b>East</b>  | Pastoral land (Exmouth Gulf Station); Exmouth Gulf further east used for commercial prawn fishing |
| <b>South</b> | Various landfills, base supply bore-field and pastoral land                                       |

## 3 Environmental Setting

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

**Table 3-1 Key Site Details**

| Setting                  | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Climate</b>           | <p>The region has a hot, semi-arid climate, with a wet and dry season. The maximum temperatures range between 37.9°C (January) and 24.2°C (July) while minimum temperatures range between 11.4°C (July) and 24.7°C (February).</p> <p>Rainfall occurs generally between January and July with monsoonal showers between January and Late April. August to December is generally dry. The highest volume of rainfall typically occurs during the month of June with a mean monthly rainfall amount of 43.5 mm.</p>                                                                                                    |
| <b>Topography</b>        | <p>The site is located on a coastal plain and is generally flat. The elevation on site ranges between 0 and 20 meters relative to the Australian Height Datum (m AHD).</p> <p>To the west of site, the elevation at the coastal ranges are 220 m AHD.</p>                                                                                                                                                                                                                                                                                                                                                            |
| <b>Acid Sulfate Soil</b> | <p>A review of the Acid Sulfate Soils (ASS) risk mapping, available on the WA Atlas online database indicates the following:</p> <ul style="list-style-type: none"> <li>to the north of the site is classified as having a moderate to low risk of ASS occurring within the top 3m of natural soil but high to moderate risk of ASS beyond 3m of natural soil surface</li> <li>the salt pan to the east is classified as having a high to moderate risk of ASS occurring in the top 3m of natural soil.</li> </ul>                                                                                                   |
| <b>Hydrology</b>         | <p>The Exmouth Gulf is located approximately 600 m east of the site at its closest point. The site is also crossed west to east by three ephemeral creeks.</p> <p>RAAF Base Learmonth contains a number of constructed drains that direct surface water towards drainage channels that discharge into WAPET Creek (Central and Southern channels) or Exmouth gulf (northern channel). It was considered likely that the water flow in these drains are limited to high rainfall event. The northern channel was noted by GHD to inundated with seawater during high tide from the coast to the boundary of Base.</p> |



| Setting      | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              | <p>WAPET creek is located to the east of the site and is lined with mangroves. Water flows tidally in and out of the creek and low-lying areas around the creek are periodically inundated.</p> <ul style="list-style-type: none"> <li>▪ The northern drainage channel discharges directly to the Exmouth Gulf. It is a constructed drain onsite but links to a wide natural channel offsite that cuts through the coastal dunes.</li> <li>▪ The central drainage channel discharges into the northern reach of WAPET Creek. It is a straight constructed channel for its entire length.</li> <li>▪ The southern drainage channel discharges in to the southern reach of WAPET Creek. It is a constructed drain onsite but links to a natural channel offsite that meanders across low lying salt pan topography.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Geology      | <p><b>Regional Geology</b></p> <p>The site is underlain by quaternary age alluvial, aeolian and littoral sediments superimposed on the coastal plain (Geological Survey of Western Australia 1980). Further inland are Quaternary alluvium and colluvium deposits that have been derived from erosion of the Cape Ranges. The deposits include clays, silts, sands and gravels. The Cape Range forms the highlands to the west of RAAF Base Learmonth and are composed of Tertiary aged Cape Range limestone units.</p> <p>The coastal areas are fringed by Holocene aged beach and sand dunes consisting of quartz and calcarenite sands. An older Quaternary dune unit is located to the south of RAAF Base Learmonth and dune forms are visible. Intertidal flats and mangrove swamps occur immediately west of the coastal sands and are associated with estuarine creeks.</p> <p><b>Site Specific Geology</b></p> <p>The findings of intrusive investigative works at RAAF Base Learmonth, undertaken by GHD between January and June 2018, were broadly consistent with the regional geology described above.</p> <ul style="list-style-type: none"> <li>▪ To the west of RAAF Base Learmonth - the geology encountered comprised of colluvium, sands and sandy clay underlain by limestone rock layer</li> <li>▪ On RAAF Base Learmonth – generally sands and clays were observed at the surface, underlain by colluvium/alluvium, gravels and sands and then weathered limestone rock</li> </ul> <p>Salt pan area to the east of base – generally sands and clays were observed at the surface, underlain by alluvium/colluvium and then shallow limestone rock. Outcrops of limestone displaying fossilised coral were observed along the southern reach of WAPET Creek.</p>                                                                                                                                                                                                                                                                                                                                                     |
|              | <ul style="list-style-type: none"> <li>▪ <b>Groundwater Occurrence</b> – The Quaternary and Tertiary geology units are hydraulically connected and form a major, unconfined aquifer. Groundwater in the Quaternary units is considered to be perched and discontinuous. The superficial Quaternary layers (dunes, colluvium, alluvium) are considered to be no more than 20 m in thickness. Coastal dunes may also contain relatively fresh groundwater but of limited extent (lenses). This has not been assessed. The main regional aquifer occurs predominantly within the Tulki Limestone (within permeable beds and the karst system) on the flanks of the range and the Mandu Limestone (within joints and minor permeable beds) on the crest of the range. These units extend to depths of greater than 150 m.</li> <li>▪ <b>Depth to Groundwater</b> – A total of 32 existing groundwater monitoring wells were gauged during October 2017 by GHD with depth to groundwater ranging from approximately 1.2 m below ground level (mbgl) to approximately 36 mbgl. The depth to water increased toward the west whereby the deepest groundwater SWLs were encountered at the foothills of the Cape Range in the production bore-field. Groundwater in the low-lying area near WAPET Creek was within 1.5 m of the surface and so is likely to interact with surface salt deposits.</li> <li>▪ <b>Groundwater Flow Direction</b> – The local groundwater flow pattern (GHD, 2018) at RAAF Base Learmonth was observed to be following the regional flow regime; that is, flowing toward the east. The calculated hydraulic gradient of groundwater across the Base was low and in the order of 0.0003 to 0.0005 m/m. The groundwater flow direction and hydraulic gradients greatly restricts the flow of contaminated groundwater from the Base to WAPET Creek or Exmouth Gulf. Instead, groundwater from the Base tends to flow towards an area of groundwater depression with elevated salinity that lies between the Base and the coast, with there being very little net flow to surface waters further to the east.</li> </ul> |
| Hydrogeology |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

| Setting                              | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                      | <ul style="list-style-type: none"> <li>▪ <b>Salinity</b> – The groundwater was generally fresh in the western wells, though groundwater near the base supply bore-field and Windmill Bore Landfill was brackish-saline. This is likely due to the abstraction of groundwater.<br/>The saltwater wedge is expected to extend 5 km inland from the east coast (Martin, 1990). The DSI identified the water was fresher in the shallow groundwater, likely due to rain infiltration. The salinity distribution in the inferred discharge area to the east is likely to have significant influence on PFAS migration and discharge.</li> <li>▪ <b>Groundwater Use</b> – The DWER groundwater database found no registered abstraction bores were identified within a 1km radius of the site.<br/>During the GHD DSI, groundwater was being abstracted from a bore near the Windmill Bore Landfill where water was being pumped to a water storage tank and then being discharged to the surface via a hose. Flow rate was estimated to be approximately 9,000 L per day. Sheep were observed drinking this water from the surface.</li> </ul> |
| <b>Environmental Sensitive Areas</b> | <p>The site is located in close proximity to the Cape Range National Park and Ningaloo Reef to the east.</p> <ul style="list-style-type: none"> <li>- No Threatened Ecological Communities (TECs) with national environmental significance, were identified in the EPBC Act Protected Matters Report generated on November 2, 2017.</li> <li>- Five priority flora species and 36 threatened or priority fauna species are known or expected to be present within 10 km of RAAF Base Learmonth.</li> <li>- The mangrove wetlands are not listed on the Ramsar Convention on Wetlands of International Importance. It does however constitute a sensitive receptor.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

*Further information can be found in the Consolidated DSI report (GHD, 2018).*

## 4 Source Areas and Risk

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

- > A combined Preliminary Site Investigation and Detailed Site Investigation (GHD, 2018)
- > An Ecological Risk Assessment (GHD 2019)

### 4.1 Source Areas

There are three monitoring areas, where PFAS was detected in soil or groundwater at concentrations exceeding the adopted assessment levels. These are considered to be the most impacted areas and include (refer to Figure 2, Appendix A):

- > 1A – Maintenance Area (Source Area)
- > 2A and 2B– Former and current Fuel Farm (Source Area)
- > 1D – Southern Drainage Channel (Pathway)
- > 1E – Central Drainage Channel (Pathway)
- > 2C – Northern Drainage Channel (Pathway)
- > 1G – WAPET Creek northern reach (Receptor)

The results of the DSI indicate that the two main PFAS source areas were the Fuel Farm and the Maintenance Area. PFAS were found to be present in all environmental media tested (soils, groundwater, sediments, and surface water where present) in these source areas. PFAS were also detected at lower concentrations at a number of other locations across the Base.

## 5 Data Quality Objectives

Development of data quality objectives (DQOs) for the OMP SAQP is based on guidance presented in the ASC NEPM (NEPC 2013) and are consistent with 'RAAF Base Learmonth PFAS Investigation PFAS Ongoing Monitoring Plan (Defence, 2019). The DQO process comprises the following seven steps:

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

The DQOs are detailed in Table 5-1.

**Table 5-1 Data Quality Objectives**

| Data Quality Step | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| State the Problem | <p>The DSI (GHD, 2018) identified PFAS in groundwater, surface water and sediment within the Management Area at concentrations exceeding the relevant assessment levels. The primary mechanisms by which PFAS has migrated off-Site are considered to be via surface drains, notably the Central Drainage Channel which discharges directly into WAPET Creek.</p> <p>The preliminary ERA (GHD, 2019) identified one exposure risk associated with foraging seabirds from the consumption of impacted biota in the northern reach of WAPET Creek. Current data for the majority of sampling locations is limited to one or two sampling events. Whilst the findings of the Preliminary ERA (GHD, 2019) recognised that an adverse ecological impact is unlikely, a robust dataset is required to assess trends in the nature, extent and magnitude of PFAS concentrations within sediment, surface water and groundwater</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                   | <p><b>Groundwater</b></p> <ul style="list-style-type: none"> <li>▪ Groundwater was found to be contaminated with PFAS, with the highest concentrations identified in the two main source areas, with relatively low concentrations elsewhere.</li> <li>▪ PFAS concentrations varied both vertically within the groundwater profile and laterally across the site. Generally, the concentrations reduced with depth and distance from contamination source areas.</li> <li>▪ Concentrations of PFAS in groundwater on the Base and in the vicinity of the Base exceed the guidelines for drinking water in the fuel farm, the maintenance area, MW117 (Base Landfill), STP, MW124 (Salt pan area), MW138 (Central Drainage Channel), MW172 (Former Aircraft Parking Area South), MW183 (UST at Former Powerhouse) and MW108 (UST/AST at ALER 36). In these areas the groundwater is saline and is not potable, and groundwater is not used for potable purposes.</li> <li>▪ Traces of PFAS have been identified in potable wells to the west of RAAF Base Learmonth; however, the concentrations do not exceed the drinking water guideline.</li> <li>▪ The groundwater flow direction and hydraulic gradients greatly restricts the flow of contaminated groundwater from the Base to WAPET Creek or Exmouth Gulf. Traces of PFAS have been detected in shallow seepage water along shorelines; this contamination is most likely to have resulted from localised infiltration of contaminated surface water rather than groundwater migrating from the Base. It was concluded that groundwater contamination present at the Base poses a low risk to the aquatic ecosystems of surface waters (WAPET Creek and the Gulf).</li> </ul> |
|                   | <p><b>Surface Water</b></p> <ul style="list-style-type: none"> <li>▪ Concentrations of PFAS in surface water exceed the recreational water guideline in drains off-site at SW171 and in the Maintenance Area (SW122).</li> <li>▪ Groundwater may discharge to a surface water body where recreational activities occur such as swimming. However, the groundwater flow direction and hydraulic gradients greatly restrict the rate of flow and the discharge to WAPET Creek or</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |



| Data Quality Step                                        | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                          | <p>Exmouth Gulf. Measured concentrations in surface water bodies are below relevant guideline.</p> <ul style="list-style-type: none"> <li>Waters of the WAPET Creek southern reach are regularly flushed by the tides and PFAS was not detected in samples of surface water and biota.</li> <li>Waters of the northern reach are irregularly flushed by the tides, and PFAS was detected in samples of surface water and crabs. The concentrations of PFAS in crabs were low and do not pose a risk to humans consuming crustaceans from the northern reach of WAPET Creek.</li> <li>Trace concentrations of PFAS were detected in water seeping from the coast line and discharging to Exmouth Gulf. PFAS were not detected in fish and crabs in the Gulf waters.</li> </ul> <p><b>Soil and Sediment</b></p> <ul style="list-style-type: none"> <li>PFAS contamination in the Maintenance Area exceeded the human health screening level protective of residential land-use however, the soil collected in residential backyards were below guidelines.</li> <li>In several locations (the Maintenance Area, Fuel Farm, BH209 (Grid sample onsite) and BH329 (UST at Former Powerhouse) there were exceedances of the screening criterion for Interim Ecological Indirect Exposure Commercial/Industrial.</li> <li>Contaminated soil and sediment can be mobilised and flow along surface drains offsite to WAPET Creek and Exmouth Gulf; however, such migration will be generally limited to larger rainfall events and flooding and will be subject to significant dilution</li> </ul> <p>Most of the sampling locations (groundwater, surface water, and sediment sampled as part of the DSI) have only been tested once or twice (i.e. limited time series/seasonal data). A robust dataset is required to assess trends in the nature, extent and magnitude of PFAS concentrations within sediment, surface water and groundwater to validate/improve the understanding of the CSM in relation to spatial and temporal variability of PFAS concentrations within the Management Area and associated receptors.</p> |
| <b>Identify the decision/principal study question(s)</b> | <p>This OMP is to provide further data to assess the following principal study questions:</p> <ul style="list-style-type: none"> <li>What are the changes and trends in the nature, extent and magnitude of PFAS concentrations in the groundwater, surface water and sediment within the Management Area?</li> <li>Has the nature, extent and magnitude of PFAS concentrations changed significantly to warrant a revision of the ERA?</li> <li>Has the nature, extent and magnitude of PFAS concentrations changed significantly to warrant refinement of any existing management measures?</li> <li>Has the nature, extent and magnitude of PFAS concentrations changed significantly or are they likely to change?</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Identify the Inputs into the Decision</b>             | <p>The following inputs are required to resolve the principal study questions outlined in Step 2:</p> <ul style="list-style-type: none"> <li>PFAS concentrations in groundwater, surface water and sediment from previous and future monitoring events.</li> <li>Field data (i.e. groundwater levels, physico-chemical parameters) on groundwater and surface water from previous and future monitoring events.</li> <li>An appropriate statistical evaluation of the data (e.g. using Mann-Kendall or similar analysis) including short and long term trends, in particular for surface water and groundwater concentrations.</li> <li>Comparison of data sets to relevant endorsed assessment levels (refer to Section 7).</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Study Boundaries</b>                                  | <p>Ongoing monitoring will be undertaken within the boundaries of the Management Area (Figure 2, Appendix A) at the groundwater, surface water and sediment monitoring locations outlined in Sections 6.3.1 and 6.4.1.</p> <p>Monitoring will be undertaken every six months, with one monitoring event in November and June.</p> <p>An additional surface water and sediment monitoring event will take place following the first flush immediately (or as close as possible) following the first heavy rainfall event of the wet season. Section 6.4 provides further detail on the monitoring frequency.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

| Data Quality Step                                 | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                   | <ul style="list-style-type: none"> <li>▪ The analytical and field data will be used to assess changes to the nature, extent and magnitude of PFAS in surface water, sediment and groundwater and to provide supporting data for assessment of management actions, where relevant.</li> <li>▪ Trends in PFAS concentrations, including an assessment of temporal and spatial changes, will be assessed using an appropriate statistical analysis approach (e.g. using Mann- Kendall, GWSdat or similar analysis), with a specified level of confidence based upon the number of monitoring rounds completed.</li> <li>▪ The analytical data will be compared to the relevant assessment levels (presented in Section 7) and/or historic concentrations (i.e. maximum concentration) recorded during prior monitoring rounds [i.e. during the DSI (GHD, 2018)] to evaluate changes in the risk profile and whether revision of the OMP, ERA or implemented management measures is warranted.</li> </ul> <p>Where exceedances of adopted assessment criteria levels (presented in Section 7) or new detections are reported, further interrogation of data will be undertaken to the extent relevant to assess the risk profile and location. A summary of the key decision rules as detailed below:</p> <ol style="list-style-type: none"> <li>1. Have the analytical data collected as part of the monitoring program met the DQI (refer Table 5-2.below)? If yes, then the data can be used to answer the decision rule below and the decision statements developed in Step 2. If no, then an assessment of the need to collect additional data will be required.</li> <li>2. Do PFAS concentrations exceed the investigation criteria? If no, then the contamination would be considered not to pose an unacceptable risk. Where results exceed the adopted investigation criteria, this may not necessarily indicate an unacceptable level of risk. Further risk assessment, and potentially additional investigations, will be required to determine the potential for unacceptable impacts.</li> <li>3. Has PFAS been detected in any of the off-site bores previously not detected? If yes, do PFAS concentrations reported indicate an increasing trend and/or exceed historic maximum concentrations? Do results indicate a potential risk to associated receptors including associated risks that PFAS may present towards human receptors (i.e. consumers of abstracted water). Further risk assessment, and potentially additional investigations, will be required to determine the potential for unacceptable impacts.</li> <li>4. Has PFAS been detected in onsite drainage channels and offsite surface water bodies within the management areas? If yes, do PFAS concentrations reported indicate an increasing trend or exceed historic maximum concentrations? Do results indicate a potential risk to receptors and changes to the risk profile? Further risk assessment, and potentially additional investigations, will be required to determine the potential for unacceptable impacts.</li> </ol> <p>The Annual Interpretive Report will review the results obtained against these triggers/decisions and the management response triggers and contingencies detailed in the OMP (Section 4.3).</p> |
| <b>Specify Limits on Decision Error</b>           | <p>The potential for significant decision errors will be minimised by completing a robust QA/QC program in accordance with DWER and NEPM guideline requirements. Standard operating procedures will be closely followed in the field to ensure accurate and representative data acquisition. DQIs will be applied to assess usability of data prior to making decisions, based on precision, accuracy, representativeness, comparability and completeness. The acceptable limit on decision error is 95% compliance with the applied DQIs (see Table 5-2). If any of the DQIs are not met, further assessment will be necessary to evaluate the significance of the non- conformance and any corrective actions.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Optimise the Design for Obtaining the Data</b> | <p>The design of the OMP has been made in consideration of historical activities at the site, historical investigations (and findings i.e. DSI and ERA), in the context of developing responses to the principal study questions outlined in Step 2 and to meet the DQOs ensuring that a representation of the current site condition can be achieved.</p> <p>The OMP scope for the first three years of monitoring is outlined in Section 6. Following initial implementation (and review following each monitoring event), the available data will be reviewed and evaluated to determine if the frequency of monitoring should increase or decrease to provide better understanding of PFAS concentration fluctuations and potential risks to receptors.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

| Data Quality Step | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                   | <p>As additional information is gathered during the course of this monitoring program, it may be beneficial for the proposed scope of works to be altered from the initial design. Changes to the proposed monitoring, if considered necessary, will be made based on risk profile reviews and updated CSM and in consultation with Defence.</p> <p>Other factors that will optimise the design for obtaining data will include the use of laboratories that are NATA accredited for PFAS analysis and ensure laboratory LORs are suitable to meet the relevant adopted assessment levels (where possible), experienced field scientist(s), robust field and laboratory quality assurance/quality control protocols are adopted and Field and analytical data are collected in accordance with the PFAS NEMP (HEPA 2020), ASC NEPM (NEPC 2013) and the assessment of contaminated sites (DER 2014).</p> |

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



Table 5-2 Data Quality Indicators

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

## 6 Ongoing Monitoring Program

### 6.1 OMP SAQP History

The changes made to the OMP SAQP since the Rev1 are documented in Table 6-1.

**Table 6-1 OMP SAQP History**

| SAQP Version | Date       | Report Section | Changes                                                                                                                                     | Justification                                                                                                                                                                                                                     |
|--------------|------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Rev 2        | 21/11/2019 | -              | Formatting and figures updates, minor changes.                                                                                              | Defence review                                                                                                                                                                                                                    |
| Rev 3        | 18/06/2020 | 7              | Update of assessment criteria and reference to HEPA (2020).                                                                                 | New guideline (HEPA, 2020)                                                                                                                                                                                                        |
| Rev 4        | 10/03/2021 | 6.3            | Table 'Wells construction details' added.<br>Well ID update as per DCARM update (MWA0294 renamed MW211).<br>MW063A (lost) replaced by MW233 | DCARM update<br>Defence review                                                                                                                                                                                                    |
|              |            | 6              | Methodology tables updates                                                                                                                  |                                                                                                                                                                                                                                   |
| Rev 5        | 14/06/2021 | 6              | Groundwater Methodology table updates                                                                                                       | Defence review                                                                                                                                                                                                                    |
| Rev 6        | 16/06/2022 | 6              | Lost monitoring well MW016 replaced by adjacent suitable monitoring well MW238                                                              | MW016 was found filled with soil due to no gatic lid covering the well. MW238 is also positioned down-gradient of the Fuel Farm (source area 2) and historical data is available as this location was sampled as part of the DSI. |

### 6.2 Management Area Description

The OMP includes sampling and analysis not only from the site, but also from a number of surrounding (off-Site) waterways. The site and these surrounding areas are collectively referred to as the "Management Area" (GHD, 2018). The Management Area boundaries are presented on Figure 2, Appendix A and encompasses:

- > RAAF Base Learmonth.
- > land east of the Base, including the salt pan, drainage channels, WAPET Creek and extends to Exmouth Gulf.

### 6.3 Groundwater Monitoring

#### 6.3.1 Groundwater Monitoring Network

The monitoring network investigated during the DSI (GHD, 2018) includes 32 single level monitoring wells and 17 multilevel wells. The network of on- and off-Site groundwater monitoring locations are summarised in Table 6-2 and Table 6-3.

**Table 6-2 Single Level Monitoring Wells**

| Location     | Well Depth | Well ID                                                                                                                                                   | Average Screen Interval (mBGL) |
|--------------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| On-site (30) | Shallow    | MW114, MW021, MW113, MW165, MW166, MW167, MW168, MW112, MW115, MW122, MW172, MW170, MW127, MW126, MW102, MW105, MW148S, MW151, MW159, MW103, MW104, MW124 | 2 - 8                          |
|              | Deep       | MW162, MW163, MW164, MW48D                                                                                                                                | 17 - 20                        |

| Location     | Well Depth | Well ID                    | Average Screen Interval (mBGL) |
|--------------|------------|----------------------------|--------------------------------|
|              | Unknown    | MW233, MW211, MW018, MW116 | -                              |
| Off-site (2) |            | MW139, MW134               | 3 - 9                          |

The concentrations of PFOA and sum of PFOS and PFHxS recorded in the multilevel wells during the DSI (GHD, 2018) are summarised in Table 6-3. The PFAS concentrations were generally consistent or lower in the deeper screened intervals than the shallow interval.



**Table 6-3 Multilevel groundwater wells**

| Well ID | Screen Interval (mBGL) | Times Sampled | 2018 Sum of PFHxS + PFOS (µg/L) | 2018 PFOA (µg/L) |
|---------|------------------------|---------------|---------------------------------|------------------|
| MW135   | 2.5 - 3                | 2             | 0.008                           | 0.003            |
|         | 4.5 - 5                | 2             | 0.011                           | 0.001            |
|         | 6.5 - 7                | 2             | 0.031                           | 0.001            |
|         | 9 - 9.5                | 2             | 0.011                           | ND               |
| MW137   | 0.8 - 1.3              | 1             | 0.011                           | ND               |
|         | 2.5 - 3                | 1             | 0.013                           | ND               |
|         | 4.5 - 5                | 1             | 0.011                           | ND               |
|         | 6.5 - 7                | 1             | 0.008                           | ND               |
| MW138   | 3 - 3.5                | 1             | ND                              | ND               |
|         | 5 - 5.5                | 1             | 0.1                             | 0.004            |
|         | 7 - 7.5                | 2             | 0.006                           | 0.002            |
|         | 9 - 9.5                | 2             | 0.1                             | 0.004            |
| MW140   | 1.5 - 2                | 1             | 0.003                           | ND               |
|         | 3.5 - 4                | 1             | 0.003                           | ND               |
|         | 6 - 6.5                | 1             | 0.002                           | ND               |
|         | 8.5 - 9                | 1             | ND                              | ND               |
| MW141   | 1.5 - 2                | 2             | 0.002                           | 0.002            |
|         | 3 - 3.5                | 2             | 0.008                           | ND               |
|         | 5 - 5.5                | 2             | 0.007                           | ND               |
|         | 7 - 7.5                | 2             | 0.003                           | ND               |
| MW143   | 3 - 3.5                | 2             | ND                              | ND               |
|         | 5 - 5.5                | 2             | ND                              | 0.002            |
|         | 7 - 7.5                | 2             | 0.008                           | 0.002            |
|         | 9 - 9.5                | 2             | ND                              | 0.003            |
| MW144   | 3 - 3.5                | 2             | 0.001                           | 0.002            |
|         | 5 - 5.5                | 2             | ND                              | 0.002            |
|         | 7 - 7.5                | 2             | ND                              | 0.006            |
|         | 9 - 9.5                | 2             | ND                              | ND               |
| MW145   | 3 - 3.5                | 2             | ND                              | ND               |

| Well ID | Screen Interval (mBGL) | Times Sampled | 2018 Sum of PFHxS + PFOS (µg/L) | 2018 PFOA (µg/L) |
|---------|------------------------|---------------|---------------------------------|------------------|
|         | 5 – 5.5                | 2             | ND                              | ND               |
|         | 7 – 7.5                | 2             | ND                              | ND               |
|         | 9 – 9.5                | 2             | 0.005                           | ND               |
|         | 2.5 – 3                | 2             | 0.028                           | 0.001            |
| MW146   | 4.5 – 5                | 2             | ND                              | 0.003            |
|         | 6.5 – 7                | 2             | ND                              | 0.001            |
|         | 8.5 - 9                | 2             | ND                              | 0.001            |
|         | 3 – 3.5                | 2             | 0.007                           | 0.002            |
| MW147   | 5 – 5.5                | 2             | ND                              | ND               |
|         | 7 – 7.5                | 2             | ND                              | 0.002            |
|         | 9 – 9.5                | 2             | ND                              | ND               |
|         | 4 – 4.5                | 2             | 0.017                           | 0.006            |
| MW175   | 5.5 – 6                | 1             | 0.012                           | 0.007            |
|         | 7 – 7.5                | 1             | 0.007                           | 0.003            |
|         | 9 – 9.5                | 1             | 0.007                           | 0.008            |
|         | 1.5 - 2                | 1             | 0.002                           | ND               |
| MW176   | 3.5 - 4                | 1             | 0.007                           | ND               |
|         | 6 - 6.5                | 1             | 0.001                           | ND               |
|         | 8.5 - 9                | 1             | ND                              | ND               |
|         | 1.5 – 2                | 1             | 0.003                           | ND               |
| MW177   | 3.5 – 4                | 1             | 0.004                           | ND               |
|         | 6 – 6.5                | 1             | 0.003                           | ND               |
|         | 8.5 - 9                | 1             | 0.002                           | ND               |
|         | 2 – 2.5                | 1             | 0.008                           | ND               |
| MW178   | 4 – 4.5                | 1             | 0.013                           | ND               |
|         | 7 – 7.5                | 1             | 0.005                           | ND               |
|         | 9 – 9.5                | 1             | 0.003                           | ND               |
|         | 1 – 1.5                | 1             | 0.019                           | 0.001            |
| MW179   | 3.2 – 3.7              | 1             | 0.007                           | 0.002            |
|         | 5.9 – 6.4              | 1             | 0.006                           | 0.003            |
|         | 8.5 - 9                | 1             | 0.004                           | 0.002            |
|         |                        |               |                                 |                  |

| Well ID | Screen Interval (mBGL) | Times Sampled | 2018 Sum of PFHxS + PFOS (µg/L) | 2018 PFOA (µg/L) |
|---------|------------------------|---------------|---------------------------------|------------------|
| MW180   | 1 – 1.5                | 1             | 0.002                           | ND               |
|         | 3.5 – 4                | 1             | 0.002                           | ND               |
|         | 6 – 6.5                | 1             | 0.003                           | ND               |
|         | 8.5 - 9                | 1             | 0.001                           | ND               |
| MW181   | 1.5 – 2                | 1             | 0.003                           | 0.002            |
|         | 3.5 – 4                | 1             | 0.002                           | 0.004            |
|         | 5.5 – 6                | 1             | 0.001                           | ND               |
|         | 7 – 7.5                | 1             | 0.002                           | 0.003            |



The groundwater monitoring locations as part of the OMP monitoring are presented in Table 6-4, along with the rationale for the selection, and are shown on Figure 3, Appendix A. For the multilevel monitoring wells, only the shallowest-non-dry screened intervals will be sampled.

Seepage water sample locations were chosen to assess the inferred groundwater discharge zone along the coast and are shown on Figure 3. They include locations near the mouth of WAPET Creek, the Northern Drainage Channel, a low point in the dunes near the southern reach and other locations along the coast.

**Table 6-4 OMP Groundwater Monitoring Locations**

| Area         | Monitoring Well / Bore ID                                                                                                                                                                                                                                                                             | Rationale                                                                                                                                                                                                                                                                              |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Source Areas | <b>Source 1 – Maintenance Area -</b><br>0960_MW114, 0960_MW021,<br>0960_MW113, 0960_MW233,<br>0960_MW211, 0960_MW162,<br>0960_MW163, 0960_MW018,<br>0960_MW164, 0960_MW165,<br>0960_MW166, 0960_MW167,<br>0960_MW168, 0960_MW112,<br>0960_MW115.                                                      | Confirmation of overall PFAS impact identified in the DSI (GHD, 2018). Assessment of overall changes in PFAS concentration in the source areas to provide temporal data on depletion of the source zone.                                                                               |
|              | <b>Source 2 – Fuel Farm–</b><br>0960_MW238, 0960_MW105,<br>0960_MW148D, 0960_MW148S,<br>0960_MW151, 0960_MW159                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                        |
| Pathway      | 0960_MW122, 0960_MW146,<br>0960_MW147, 0960_MW180,<br>0960_MW181, 0960_MW172,<br>0960_MW170, 0960_MW127,<br>0960_MW126, 0960_MW139,<br>0960_MW140, 0960_MW102,<br>0960_MW138, 0960_MW145,<br>0960_MW103, 0960_MW104,<br>0960_MW134, 0960_MW135,<br>0960_MW175, 0960_MW124,<br>0960_MW144, 0960_MW143. | Confirmation of overall PFAS impact identified in the DSI (GHD, 2018). Assessment of changes in PFAS concentration and distribution in the main migration pathways. This will also allow for early detection of significant changes in migration so contingencies can be put in place. |
| Receptor     | 0960_MW137, 0960_MW176,<br>0960_MW177, 0960_MW178,<br>0960_MW179, 0960_MW141                                                                                                                                                                                                                          | Confirmation of overall PFAS impact identified in the DSI (GHD, 2018). Assessment of changes in PFAS concentration and distribution in the main aquatic receptors.                                                                                                                     |
| Seepage      | 0960_OTH132, 0960_OTH134,<br>0960_OTH129, 0960_OTH103,<br>0960_OTH106, 0960_OTH107                                                                                                                                                                                                                    | To assess the inferred groundwater discharge zone along the coast.                                                                                                                                                                                                                     |

Construction details for the groundwater wells monitored as part of the OMP are provided in Table 6-5.

**Table 6-5 OMP Groundwater Monitoring Wells Construction Details**

| Well ID | Date drilled | Easting <sup>1</sup> | Northing <sup>1</sup> | RL TOC (mAHD) | Depth (mbgl) | Screen interval (mbgl) |
|---------|--------------|----------------------|-----------------------|---------------|--------------|------------------------|
| MW016   | 2006         | 199481.94            | 7540459.03            | 4.022         | 6.4          | 3.1-6.4                |
| MW018   | 2006         | 199251.86            | 7537465.65            | 6.403         | 8.5          | 5.5-8.5                |
| MW021   | 2006         | 199143.14            | 7537433.45            | 6.745         | 8.6          | 5.6-8.6                |
| MW102   | 2018         | 200487.728           | 7538870.392           | 4.6266        | 8.5          | 2.5-8.5                |
| MW103   | 2018         | 199762.727           | 7540965.102           | 2.2785        | 5.8          | 1.0-5.8                |
| MW104   | 2018         | 199946.08            | 7540599.855           | 2.7256        | 6.5          | 1.0-6.5                |
| MW105   | 2018         | 199491.679           | 7540303.158           | 3.7272        | 8.0          | 2.0-8.0                |
| MW112   | 2018         | 199473.4723          | 7537651.252           | 5.1191        | 8.0          | 3.0-8.0                |
| MW113   | 2018         | 199156.14            | 7537686.096           | 7.3165        | 10.0         | 4.0-10.0               |
| MW114   | 2018         | 199037.9871          | 7537512.217           | 7.7467        | 10.0         | 4.0-10.0               |
| MW115   | 2018         | 199604.327           | 7537522.607           | 4.9133        | 8.0          | 3.0-8.0                |
| MW122   | 2018         | 200580.746           | 7537635.452           | 3.9702        | 7.7          | 1.7-7.7                |
| MW124   | 2018         | 200525.625           | 7539636.566           | 2.9183        | 6.0          | 1.0-6.0                |
| MW126   | 2018         | 200301.728           | 7536952.205           | 4.5088        | 8.0          | 2.0-8.0                |
| MW127   | 2018         | 200158.599           | 7536314.042           | 5.6238        | 8.5          | 2.5-8.5                |
| MW134   | 2018         | 200439.185           | 7540598.585           | 2.5155        | 5.7          | 1.0-5.7                |
| MW135   | 2018         | 200867.402           | 7540438.161           | 2.7781        | 3.0          | 2.5-3.0                |
|         |              |                      |                       | 2.7828        | 5.0          | 4.5-5.0                |
|         |              |                      |                       | 2.7858        | 7.0          | 6.5-7.0                |
|         |              |                      |                       | 2.7884        | 9.5          | 9.0-9.5                |
| MW137   | 2018         | 201611.362           | 7539047.314           | 2.1687        | 1.3          | 0.8-1.3                |
|         |              |                      |                       | 2.1691        | 3.0          | 2.5-3.0                |
|         |              |                      |                       | 2.2017        | 5.0          | 4.5-5.0                |
|         |              |                      |                       | 2.2034        | 7.0          | 6.5-7.0                |
| MW138   | 2018         | 200820.406           | 7538649.357           | 3.3074        | 3.5          | 3.0-3.5                |
|         |              |                      |                       | 3.3166        | 5.5          | 5.0-5.5                |
|         |              |                      |                       | 3.3205        | 7.5          | 7.0-7.5                |
|         |              |                      |                       | 3.3224        | 9.5          | 9.0-9.5                |
| MW139   | 2018         | 201088.954           | 7536832.655           | 4.1386        | 7.0          | 2.0-7.0                |
| MW140   | 2018         | 202004.879           | 7537028.632           | 2.4916        | 2.0          | 1.5-2.0                |
|         |              |                      |                       | 2.5035        | 4.0          | 3.5-4.0                |
|         |              |                      |                       | 2.5081        | 6.5          | 6.0-6.5                |
|         |              |                      |                       | 2.5345        | 9.0          | 8.5-9.0                |
| MW141   | 2018         | 202555.223           | 7537320.681           | 2.7999        | 2.0          | 1.5-2.0                |
|         |              |                      |                       | 2.8073        | 3.5          | 3.0-3.5                |
|         |              |                      |                       | 2.8141        | 5.5          | 5.0-5.5                |
|         |              |                      |                       | 2.8224        | 7.5          | 7.0-7.5                |
| MW143   | 2018         | 200819.408           | 7539420.558           | 2.8174        | 3.5          | 3.0-3.5                |
|         |              |                      |                       | 2.8204        | 5.5          | 5.0-5.5                |

| Well ID | Date drilled | Easting <sup>1</sup> | Northing <sup>1</sup> | RL TOC (mAHD) | Depth (mbgl) | Screen interval (mbgl) |
|---------|--------------|----------------------|-----------------------|---------------|--------------|------------------------|
| MW144   | 2018         | 200691.327           | 7540195.613           | 2.8221        | 7.5          | 7.0-7.5                |
|         |              |                      |                       | 2.8273        | 9.5          | 9.0-9.5                |
|         |              |                      |                       | 3.0481        | 3.5          | 3.0-3.5                |
|         |              |                      |                       | 3.052         | 5.5          | 5.0-5.5                |
|         |              |                      |                       | 3.0545        | 7.5          | 7.0-7.5                |
|         |              |                      |                       | 3.0573        | 9.5          | 9.0-9.5                |
| MW145   | 2018         | 201084.426           | 7538337.599           | 3.1416        | 3.5          | 3.0-3.5                |
|         |              |                      |                       | 3.1481        | 5.5          | 5.0-5.5                |
|         |              |                      |                       | 3.1506        | 7.5          | 7.0-7.5                |
| MW146   | 2018         | 201126.901           | 7537691.759           | 3.1519        | 9.5          | 9.0-9.5                |
|         |              |                      |                       | 2.7937        | 3.5          | 3.0-3.5                |
|         |              |                      |                       | 2.8009        | 5.5          | 5.0-5.5                |
|         |              |                      |                       | 2.802         | 7.5          | 7.0-7.5                |
| MW147   | 2018         | 201259.369           | 7537322.231           | 2.8184        | 9.5          | 9.0-9.5                |
|         |              |                      |                       | 2.9123        | 3.5          | 3.0-3.5                |
|         |              |                      |                       | 2.9152        | 5.5          | 5.0-5.5                |
|         |              |                      |                       | 2.9183        | 7.5          | 7.0-7.5                |
| MW148D  | 2018         | 199536.808           | 7540521.489           | 2.9209        | 9.5          | 9.0-9.5                |
| MW148S  | 2018         | 199537.603           | 7540521.649           | 3.5778        | 20.0         | 14.0-20.0              |
| MW151   | 2018         | 199442.761           | 7540459.319           | 3.6851        | 8.0          | 2.0-8.0                |
| MW159   | 2018         | 199164.27            | 7540373.912           | 4.0631        | 8.0          | 2.0-8.0                |
| MW162   | 2018         | 199230.504           | 7537650.674           | 4.1895        | 9.0          | 3.0-9.0                |
| MW163   | 2018         | 199232.4874          | 7537569.5756          | 6.856         | 20.0         | 17.0-20.0              |
| MW164   | 2018         | 199251.946           | 7537546.874           | 6.7808        | 20.0         | 17.0-20.0              |
| MW165   | 2018         | 199312.5481          | 7537531.6778          | 6.7893        | 20.0         | 17.0-20.0              |
| MW166   | 2018         | 199363.212           | 7537610.565           | 6.1043        | 9.0          | 3.0-9.0                |
| MW167   | 2018         | 199368.445           | 7537673.832           | 5.7441        | 8.5          | 2.5-8.5                |
| MW168   | 2018         | 199390.678           | 7537754.41            | 6.2094        | 8.5          | 2.5-8.5                |
| MW170   | 2018         | 199828.672           | 7536509.856           | 6.1713        | 8.5          | 2.5-8.5                |
| MW172   | 2018         | 199755.067           | 7536989.143           | 5.639         | 8.5          | 2.5-8.5                |
| MW175   | 2018         | 201458.887           | 7540121.278           | 5.6193        | 8.5          | 2.5-8.5                |
|         |              |                      |                       | 4.7916        | 4.5          | 4.0-4.5                |
|         |              |                      |                       | 4.7982        | 6.0          | 5.5-6.0                |
|         |              |                      |                       | 4.7995        | 7.5          | 7.0-7.5                |
| MW176   | 2018         | 201711.745           | 7539606.488           | 4.8316        | 9.5          | 9.0-9.5                |
|         |              |                      |                       | 2.1274        | 2.0          | 1.5-2.0                |
|         |              |                      |                       | 2.1279        | 4.0          | 3.5-4.0                |
|         |              |                      |                       | 2.1594        | 6.5          | 6.0-6.5                |
| MW177   | 2018         | 202130.765           | 7539004.262           | 2.1712        | 9.0          | 8.5-9.0                |
|         |              |                      |                       | 2.2299        | 2.0          | 1.5-2.0                |



| Well ID | Date drilled | Easting <sup>1</sup> | Northing <sup>1</sup> | RL TOC (mAHD) | Depth (mbgl) | Screen interval (mbgl) |
|---------|--------------|----------------------|-----------------------|---------------|--------------|------------------------|
|         |              |                      |                       | 2.2517        | 4.0          | 3.5-4.0                |
|         |              |                      |                       | 2.2531        | 6.5          | 6.0-6.5                |
|         |              |                      |                       | 2.2718        | 9.0          | 8.5-9.0                |
|         |              |                      |                       | 2.1612        | 2.5          | 2.0-2.5                |
| MW178   | 2018         | 201387.629           | 7539566.48            | 2.1614        | 4.5          | 4.0-4.5                |
|         |              |                      |                       | 2.1726        | 7.5          | 7.0-7.5                |
|         |              |                      |                       | 2.1762        | 9.5          | 9.0-9.5                |
|         |              |                      |                       | 2.222         | 1.5          | 1.0-1.5                |
| MW179   | 2018         | 201939.471           | 7538448.239           | 2.2371        | 3.7          | 3.2-3.7                |
|         |              |                      |                       | 2.2653        | 6.4          | 5.9-6.4                |
|         |              |                      |                       | 2.2689        | 9            | 8.5-9.0                |
|         |              |                      |                       | 1.9179        | 1.5          | 1.0-1.5                |
| MW180   | 2018         | 201567.932           | 7537913.284           | 1.9226        | 4            | 3.5-4.0                |
|         |              |                      |                       | 1.9368        | 6.5          | 6.0-6.5                |
|         |              |                      |                       | 1.9458        | 9            | 8.5-9.0                |
|         |              |                      |                       | 2.2333        | 2            | 1.5-2.0                |
| MW181   | 2018         | 201688.497           | 7537372.233           | 2.2773        | 4            | 3.5-4.0                |
|         |              |                      |                       | 2.2789        | 6            | 5.5-6.0                |
|         |              |                      |                       | 2.3122        | 7.5          | 7.0-7.5                |
|         |              |                      |                       | 6.3409        |              |                        |
| MW211*  |              | 199199.771           | 7537549.138           | 6.3409        |              |                        |
| MW233   | 2015         | 199198.57            | 7537590.67            | 6.262         | 7            | 4-7                    |
| MW238   | 2006         | 199446.65            | 7540509.92            | 3.98          | 6            | 3.0 – 6.0              |

**Note:** \* No bore log available

### 6.3.2 Monitoring Frequency

All groundwater monitoring locations listed in Table 6-4 will be sampled every six months. The main sampling events will be undertaken in November and June to record the concentration and extent of PFAS and determine any seasonal fluctuations or trends. This monitoring frequency aligns with the climate of the Management Area, which features the highest volume of rainfall typically between January and July and lower rainfall between September and December.

Groundwater sampling, particularly those near WAPET Creek and Exmouth Gulf, must consider tidal periods to ensure spurious elevation data is not used to assess groundwater flow. Given the remoteness of the site, one-off opportunistic sampling is not considered feasible. Seepage sampling will occur at low, outgoing tides which is considered the optimal condition for groundwater discharge.

### 6.3.3 Groundwater Sampling Methodology

Groundwater sampling methodology are detailed in the following sections.

#### 6.3.3.1 Groundwater Monitoring Wells

Groundwater monitoring will be undertaken by no purge HydraSleeve® method for the single-level wells, while the multilevel wells will be sampled with a peristaltic pump and seepage water sampling will be conducted through methodology consistent with the 2018 DSI, as detailed in Table 6-6.

**Table 6-6 Groundwater Monitoring Wells – Sampling Method**

| Activity                                                                       | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Well Gauging                                                                   | Standing Water Level (SWL) will be gauged using an interface probe. All wells will be measured against a specified mark at the top of the well casing.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Groundwater Field Parameters                                                   | <p>For the single level wells, the field parameters will be recorded via a down-hole water quality meter (positioned within the mid screen interval) prior to deployment of HydraSleeves® or pre-sample collection.</p> <p>For the multilevel wells, the field parameters will be recorded with a flow through cell during purging.</p> <p>The following field parameters will be recorded using a water quality meter:</p> <ul style="list-style-type: none"> <li>pH.</li> <li>electrical conductivity (EC).</li> <li>oxidation reduction potential (ORP).</li> <li>Dissolved oxygen (DO).</li> <li>Temperature.</li> </ul> <p>Once field parameters have stabilised (as indicated by at least three consecutive measurements falling within +/- 10% of each other) measurement will be recorded on field data records.</p> <p>All field instruments (e.g. water quality meter) will be calibrated by the equipment supplier and daily readings of reference solutions (bump tests) completed to optimise the accuracy of the measurements taken.</p> |
| Peristaltic pumping (multilevel well sample collection)                        | <p>The shallowest (non-dry) wells will be sampled at each location using Teflon-free dedicated and disposable high-density polyethylene (HDPE) tubing coupled to a peristaltic pump system. The groundwater will be purged at a low flow rate of 0.2L/min.</p> <p>Near-continuous monitoring of SWL and field parameters will be undertaken during purging and post sample collection to ensure limited drawdown effects. The groundwater will be sampled when the field parameters have stabilised, or before drawdown reaches a maximum of 30 cm.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Deployment and Retrieval of HydraSleeves (single level well sample collection) | <p>HydraSleeve will be deployed with top weight sample collection to begin at the lowest point.</p> <p>HydraSleeve sampling devices will be left in wells for a minimum of 4 hours to allow restabilisation of the well following the slight disturbance caused by sampler deployment.</p> <p>Samples will be collected via continuous pull method at a rate allowing the water to pass through the check valve into the sample sleeve.</p> <p>Samples will be discharged immediately (minimise changes in chemistry) via discharge tube.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Alternative sampling methodology (hand bailing)                                | <p>Disposable HDPE hand bailers, attached to a polypropylene string, will be used in the event that the water column isn't sufficient to fill the hydrasleeve. Purging of the well (i.e. removal of 3x well volumes) will be undertaken prior to sampling to ensure that a sample representative of the aquifer is taken.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Seepage Water Sampling                                                         | <p>Sampling will be carried out in a two-hour period; one hour each side of the low tide. Sampling protocol will involve a shallow excavation in the beach sand; just above where inundation by wave action is occurring. In-situ water parameters will be measured from water seeping into the excavation using a calibrated water quality meter. Water seeping in to the excavation will be purged prior to measuring water quality parameters (using a dedicated syringe or jug). Once</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

| Activity                                                        | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                 | more water seeps in to the excavation, sampling containers will be lowered into the exposed seepage water and filled.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Field Records                                                   | <p>Field records will include the following information:</p> <ul style="list-style-type: none"> <li>Sampling time, date and name of the sampler.</li> <li>Weather conditions.</li> <li>Sample Collection method.</li> <li>Sampling equipment decontamination procedures where non-disposable sampling equipment is utilised.</li> <li>Calibration and daily bump test records.</li> </ul> <p>All sample documentation including field notebooks, reporting records, COC and equipment calibration certificates and procedures will be retained within project files.</p>                                                                                                                                                                                         |
| Decontamination procedure                                       | <p>Dedicated HydraSleeves will be used at each groundwater bore thus removing the need for decontamination.</p> <p>All re-usable sampling equipment will be thoroughly washed using PFAS-free detergent then double rinsed with clean water before the sample collection.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Sample identification, preservation transport and holding times | <p>Each sample will be labelled with the sample location, date, project identification number and sampler's initials.</p> <p>Samples will be collected directly in appropriately preserved laboratory supplied bottles (Teflon-free) and packed in chilled containers for delivery to the laboratory under Chain of Custody (CoC) documentation.</p> <p>Sample containers, preservation procedures, sample storage requirements and holding times will be undertaken in accordance with those recommended by Standards Australia (AS/NZS 5667.1:1998 and AS 4482.1 as appropriate).</p> <ul style="list-style-type: none"> <li>All holding times will comply with the requirements set out in "Australian Standard AS/NZS 5667.1:1998 and AS 4482.1".</li> </ul> |
| Laboratory Testing                                              | <ul style="list-style-type: none"> <li>Full PFAS analytical suite (see Appendix B).</li> <li>Major anions and cations (include calcium, magnesium, sodium, potassium, chloride, sulfate, alkalinity and ionic balance)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Laboratory Testing – Quality Control                            | <ul style="list-style-type: none"> <li>Groundwater QC samples will be collected at the following frequencies as detailed in the OMP (DoD, 2019):</li> <li>Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch is less than 10 samples.</li> <li>Field triplicate (inter-laboratory) samples at 1 per 10 water samples should be sent to a secondary laboratory.</li> <li>Rinsate blank sample at 1 per day [collected off re-used sampling equipment (e.g. interface probe)].</li> <li>Field blank samples at 1 per day.</li> </ul>                                                                                                                                                                                 |
| Laboratory Accreditation and Limits of Reporting                | <p>All groundwater analysis will be undertaken by laboratories accredited by the NATA.</p> <ul style="list-style-type: none"> <li>Primary analysis will be undertaken by ALS Global Laboratories (Perth)</li> <li>Secondary analysis will be undertaken by Eurofins (Perth).</li> </ul> <p>Laboratory LORs will be suitable to meet the relevant adopted assessment levels (0.01 µg/L).</p>                                                                                                                                                                                                                                                                                                                                                                      |

## 6.4 Surface Water and Sediment Monitoring

### 6.4.1 Monitoring Locations

The surface water and sediment locations within the Monitoring Areas described in section 4.1, sampled as part of the DSI (GHD, 2018) are summarised in Table 6-7.



**Table 6-7 Summary of Surface Water and Sediment Monitoring Locations (GHD, 2018)**

| Management Area | Location                                 | Soil Monitoring Location (Sediment/Shallow Soil)                                                        | Surface Water Monitoring locations                            |
|-----------------|------------------------------------------|---------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|
| 1a              | Maintenance Area (Source Area)           | SS240, SS241, SS120, SS121, SS122, SS124, SS125, SS126, SS239, SS238, SS119, SS123                      | SW120, SW121, SW122, SW119, SW123                             |
| 2a & 2b         | Former and Current Fuel Farm             | SD219, SS109, SS110, SS111, SS112, SS113, SS114, SS115, SS228, SS229, SS231, SS232, SS233, SS234, SS235 | SW114, SW219                                                  |
| 1d              | Southern Drainage Channel (Pathway)      | SD199, SS296, SS201, SD200, SS297, SD202, SS298, SS299, SD203, SS300, SS301, SD204, SS302, SD205        | SW302, SW200, SW202, SW204, SW297, SW298, SW299, SW300, SW301 |
| 1e              | Central Drainage Channel (Pathway)       | SS195, SS291, SS196, SS292, SS197, SS198, SS293, SS294, SS295                                           | SW195, SW291, SW293, SW294, SW295                             |
| 2c              | Northern Drainage Channel (Pathway)      | SS189, SS286, SS190, SS194, SS288, SS191, SS289, SS193, SS290, SS192, SS287                             | SW286, SW287, SW288, SW289, SW290, SW304, SW303               |
| 1g              | Northern reach of WAPET Creek (Receptor) | SD208, SD209, SD210, SD211                                                                              | SW208, SW209, SW210, SW211, SW305, SW306,                     |

The surface water locations as part of the OMP monitoring are presented in Table 6-8 along with the rationale for the selection, and are highlighted on Figure 4, Appendix A. The location shown on Figure 4 are for guidance and actual locations will depend on conditions at the time of sampling. Priority will be given to areas where surface water has pooled and to low lying areas where sediment can accumulate.

**Table 6-8 OMP Surface Water and Sediment Monitoring Locations**

| Area                                   | Surface water Sampling Location ID                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Sediment Sampling Location ID                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Rationale                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Drainage channels (source and pathway) | <b>Bi-annual and first flush events:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>Bi-annual and first flush events:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <p>The monitoring will assess the PFAS extent and changes in the Central Drainage Channel leading to WAPET Creek. It will also confirm the low risk posed by sediment and surface water in other drainage channels.</p> <p>Monitoring of these locations will provide an indication of any change in the nature or magnitude of PFAS in surface waters and sediments, and will help in determining changes attributable to seasonal fluctuations.</p> <p>Priority will be given to areas where surface water has pooled and to low lying areas where sediment can accumulate. This includes surface water pooling on Base at the flood gate release point, which if present during wet season monitoring will be sampled.</p> |
|                                        | 0960_SW219, 0960_SS234,<br>0960_SS235, 0960_SW114,<br>0960_SS113, 0960_SS231,<br>0960_SW157, 0960_SW265,<br>0960_SW189, 0960_SW190,<br>0960_SW288, 0960_SW193,<br>0960_SW192, 0960_SW198,<br>0960_SW293, 0960_SS292,<br>0960_SW291, 0960_SS227,<br>0960_SS108, 0960_SW170,<br>0960_SS168, 0960_SS279,<br>0960_SS166, 0960_SS243,<br>0960_SS174, 0960_SW121,<br>0960_SW122, 0960_SS124,<br>0960_SS277, 0960_SS125,<br>0960_SS278, 0960_SS176,<br>0960_SW123, 0960_SW199,<br>0960_SW200, 0960_SW298 | 0960_SD219, 0960_SS234,<br>0960_SS235, 0960_SS114,<br>0960_SS113, 0960_SS231,<br>0960_SS157, 0960_SS265,<br>0960_SS189, 0960_SS190,<br>0960_SS288, 0960_SS193,<br>0960_SS192, 0960_SS198,<br>0960_SS293, 0960_SS292,<br>0960_SS291, 0960_SS227,<br>0960_SS108, 0960_SS170,<br>0960_SS168, 0960_SS279,<br>0960_SS166, 0960_SS243,<br>0960_SS174, 0960_SS121,<br>0960_SS122, 0960_SS124,<br>0960_SS277, 0960_SS125,<br>0960_SS278, 0960_SS176,<br>0960_SS123, 0960_SD199,<br>0960_SD200, 0960_SS298 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| WAPET CREEK (Receptor)                 | <b>Bi-annual and first flush events:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>Bi-annual and first flush events:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <p>WAPET Creek is the most important receptor with respect to identified risk. Monitoring of these locations will provide an indication of any change in the nature or magnitude of PFAS in surface waters and sediments, and will help in determining changes attributable to seasonal fluctuations</p>                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                        | 0960_SW211, 0960_SW300,<br>0960_SW210, 0960_SW001,<br>0960_SW302, 0960_SW303,<br>0960_SW209, 0960_SW304,<br>0960_SW305, 0960_SW207,<br>0960_SW208, 0960_SW205,<br>0960_SW301                                                                                                                                                                                                                                                                                                                      | 0960_SD211, 0960_SD300,<br>0960_SD210, 0960_SD301,<br>0960_SD302, 0960_SD303,<br>0960_SD209, 0960_SD304,<br>0960_SD305, 0960_SD207,<br>0960_SD208, 0960_SD205,<br>0960_SS301                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

## 6.4.2 Surface Water and Sediment Monitoring Frequency

The surface water and sediment monitoring locations listed in Section 6.4.1 will be sampled three times per year, as follows:

- > November and June to record the concentration and extent of PFAS and determine any seasonal fluctuations or trends. This monitoring frequency aligns with the climate of the Management Area, which features the highest volume of rainfall typically between January and July and lower rainfall between September and December. This sampling should be conducted in conjunction with the groundwater monitoring described in Section 6.3.
- > An additional monitoring event will be conducted immediately (or as close as possible) following the first heavy rainfall event of the wet season in January or February. This would serve to assess the potential increase in PFAS surface water concentrations following 'first flush' rainfall and subsequent timeframe for attenuation to 'long-term average' concentrations.

## 6.4.3 Surface Water Sampling Methodology

The methodology for the surface water monitoring is detailed in Table 6-9.

**Table 6-9 Surface Water Monitoring**

| Item                                                              | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Field parameters                                                  | Surface water physiochemical parameters (i.e. pH, electrical conductivity (EC), oxidation reduction potential (ORP), dissolved oxygen (DO), and temperature) will be recorded at the time of sampling using a pre-calibrated water quality meter.<br>Field observations such as odours or sheen presence must also be recorded on field sampling sheets.                                                                                                                                                                                                                                                                                                                                                                                   |
| Sampling Method                                                   | Surface water samples will be collected directly into sample containers using a 'Grab' (manual) sample method via a long-handled sampling device.<br>Where depth permits, the sample container should be positioned at least 10 cm below the surface water level and above the sediment bed and oriented with the capped opening facing downwards to avoid the collection of surface films.<br>Samples will be decanted into the laboratory supplied sample containers.<br>Samples will be collected in accordance with Australian/New Zealand Standards (AS/NZS 5667.1:1998) 'Water quality – Sampling – Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples'.                  |
| Sample Collection                                                 | Water samples were placed directly into appropriately labelled, laboratory supplied sample bottles and packed in chilled containers for delivery to the laboratory under Chain of Custody documentation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Decontamination                                                   | All re-usable sampling equipment will be thoroughly washed using PFAS-free detergent, then double rinsed with clean water before the sample collection.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Sample identification, preservation, transport and holding times. | Each sample will be labelled with the sample location, date, project identification number and sampler's initials.<br>Samples will be contained in appropriately preserved laboratory supplied bottles (Teflon-free) and packed in chilled containers for delivery to the laboratory under Chain of Custody (CoC) documentation.<br>Sample containers, preservation procedures, sample storage requirements and holding times will be undertaken in accordance with those recommended by Standards Australia (AS/NZS 5667.1:1998 and AS 4482.1 as appropriate). <ul style="list-style-type: none"> <li>▪ All holding times will comply with the requirements set out in "Australian Standard AS/NZS 5567.1:1998 and AS 4482.1".</li> </ul> |
| Field Records                                                     | Field records will include the following information: <ul style="list-style-type: none"> <li>▪ Sampling time, date and name of the sampler.</li> <li>▪ Weather conditions.</li> <li>▪ Sample Collection method.</li> <li>▪ Sampling equipment decontamination procedures where non-disposable sampling equipment is utilised.</li> <li>▪ Calibration and daily bump test records.</li> </ul>                                                                                                                                                                                                                                                                                                                                               |



| Item                                             | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                  | All sample documentation including field notebooks, reporting records, COC and equipment calibration certificates and procedures will be retained within project files.                                                                                                                                                                                                                                                                                                                                                    |
| Laboratory Testing                               | <p>Surface water samples will be analysed for the following:</p> <ul style="list-style-type: none"> <li>Full PFAS analytical suite (see Appendix B).</li> <li>Major anions and cations (include calcium, magnesium, sodium, potassium, chloride sulfate, alkalinity and ionic balance)</li> <li>DOC, TSS, TDS and pH.</li> </ul>                                                                                                                                                                                           |
| Laboratory Testing – Quality Control             | <p>Surface water QC samples will be collected at the following frequencies as detailed in the SAQP:</p> <ul style="list-style-type: none"> <li>Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch is less than 10 samples.</li> <li>Field triplicate (inter-laboratory) samples at 1 per 10 water samples should be sent to a secondary laboratory.</li> <li>Rinsate blank sample at 1 per day [collected off re-used sampling equipment (e.g. interface probe)].</li> </ul> |
| Laboratory Accreditation and Limits of Reporting | <p>All surface water analysis will be undertaken by laboratories accredited by the NATA.</p> <ul style="list-style-type: none"> <li>Primary analysis will be undertaken by ALS Global Laboratories (Perth)</li> <li>Secondary analysis will be undertaken by Eurofins (Perth).</li> </ul> <p>Laboratory LORs will be suitable to meet the relevant adopted assessment levels (0.01 µg/L).</p>                                                                                                                              |

#### 6.4.4 Sediment Sampling Methodology

The methodology for sediment sampling is detailed in Table 6-10.

**Table 6-10 Sediment Investigation Methodology**

| Item                                 | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sample Collection                    | <p>Sediment samples will be collected at the sediment/water interface (0-0.1 mbgl) using hand tools (e.g. trowel, hand auger, PVC pipe etc.) with samples placed directly into appropriately labelled, laboratory supplied sample containers and packed in chilled containers for delivery to the laboratory under Chain of Custody documentation.</p> <p>At each sampling location, the sediment sample will be visually assessed and observations (including physical description) recorded on field data sheets.</p>                                           |
| Field Records                        | <p>Field records will include the following information:</p> <ul style="list-style-type: none"> <li>Sampling time, date and name of the sampler.</li> <li>Sample description and condition.</li> <li>Weather conditions.</li> <li>Sample Collection method.</li> <li>Sampling equipment decontamination procedures where non-disposable sampling equipment is utilised.</li> </ul> <p>All sample documentation including field notebooks, reporting records, COC and equipment calibration certificates and procedures will be retained within project files.</p> |
| Decontamination                      | <p>All re-usable sampling equipment will be thoroughly washed using PFAS-free detergent, then double rinsed with clean water before the sample collection.</p>                                                                                                                                                                                                                                                                                                                                                                                                    |
| Laboratory Testing                   | <p>Sediment samples will be analysed for the following:</p> <ul style="list-style-type: none"> <li>Full PFAS analytical suite (see Appendix B).</li> <li>Total organic carbon (TOC), EC, cation exchange capacity (CEC) and pH</li> </ul>                                                                                                                                                                                                                                                                                                                         |
| Laboratory Testing – Quality Control | <p>Sediment QC samples will be collected at the following frequencies as detailed in the SAQP:</p> <ul style="list-style-type: none"> <li>Field duplicate (intra-laboratory) samples greater than 1 per 20 sediment samples or 1 per batch if the batch is less than 20 samples.</li> </ul>                                                                                                                                                                                                                                                                       |

| Item                                             | Details                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                  | <ul style="list-style-type: none"> <li>Field triplicate (inter-laboratory) samples greater than 1 per 20 sediment samples should be sent to a secondary laboratory.</li> </ul>                                                                                                                                                                                                                  |
| Laboratory Accreditation and Limits of Reporting | <p>All surface water analysis will be undertaken by laboratories accredited by the NATA.</p> <ul style="list-style-type: none"> <li>Primary analysis will be undertaken by ALS Global Laboratories (Perth)</li> <li>Secondary analysis will be undertaken by Eurofins (Perth).</li> </ul> <p>Laboratory LORs will be suitable to meet the relevant adopted assessment levels (0.005 mg/kg).</p> |

## 7 Assessment Criteria

### 7.1 Groundwater and Surface Water

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

**Table 7-1 Criteria for Groundwater, Seepage Water and Surface Water**

| Receptor            | Adopted Assessment Criteria                                                                                                                                                         |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Ecological</b>   | <p><b>99% species protection level for Fresh Water and interim Marine Water:</b></p> <ul style="list-style-type: none"> <li>PFOS – 0.00023* µg/L</li> <li>PFOA – 19 µg/L</li> </ul> |
| <b>Human Health</b> | <p><b>Recreational Use:</b></p> <ul style="list-style-type: none"> <li>PFOS + PFHxS – 2.0 µg/L</li> <li>PFOA – 10 µg/L</li> </ul>                                                   |

\*The criterion of 0.00023 µg/L is lower than the laboratory level of reporting (LOR) and is somewhat impractical. However, the PFAS NEMP 2020 allows for the adoption of the laboratory LOR as a screening level rather than a quantified measurement. At a minimum, the LOR to be adopted is to be consistent with the LORs in the DSI (GHD, 2018).

### 7.2 Sediment

It is noted that there are currently no Australian regulatory endorsed assessment levels for risk posed to ecology or human health by PFAS in sediment. Most of the time these will be dry and sediment that has accumulated in the base of unsealed drainage lines can be assumed to be associated with exposure pathways similar to those of in-situ soils. Sediment results will therefore be assessed with reference to the soil assessment criteria detailed in the PFAS NEMP 2.0 (HEPA, 2020). Criteria for sediment samples are presented in Table 7-2.

**Table 7-2 Criteria for Sediment**

| Receptor            | Adopted Assessment Criteria                                                                                                                                                                                                                                                                 |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Ecosystems</b>   | <p><b>Ecological direct exposure (interim guidelines)</b></p> <ul style="list-style-type: none"> <li>PFOS – 1 mg/kg</li> <li>PFOA – 10 mg/kg</li> </ul> <p><b>Ecological indirect exposure (interim guidelines)</b></p> <ul style="list-style-type: none"> <li>PFOS – 0.01 mg/kg</li> </ul> |
| <b>Human Health</b> | <p><b>Commercial / industrial (on-base activities)</b></p> <ul style="list-style-type: none"> <li>PFOS + PFHxS – 20 mg/kg</li> <li>PFOA – 50 mg/kg</li> </ul>                                                                                                                               |

## 8 Reporting

### 8.1 Factual Reporting

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

- > Introduction
- > Scope of work completed.
- > Description of sampling methodologies used.
- > Field observations (e.g. condition of monitoring wells, description of purged water) and water quality parameter measurements.
- > 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
- > Evaluation of the applicability of adopted assessment levels.
- > Review of the suitability of the data for assessment purposes (QA/QC evaluation).
- > Summary tables presenting gauged groundwater and surface water levels.
- > Presentation of inferred groundwater contours and inferred groundwater flow direction in a figure.
- > Summary tables of analytical results in comparison to adopted assessment levels.
- > Graphs showing historical concentrations of PFOS, PFOA and PFOS plus PFHxS.
- > Laboratory reports, Chain of Custody (CoC) documentation, field sampling records, data validation and QA/QC details, equipment calibration certificates and other relevant documentation.

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

### 8.2 Interpretive Reporting

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

- > The factual information described in Section 8.1.
- > Evidence of compliance with the requirements of the SAQP and meeting stated objectives of the OMP.
- > Relevant figures depicting sampling locations and site-specific hydrogeological features.
- > Laboratory results and analysis including comparison with relevant screening criteria as identified in each OMP.
- > Assessment and commentary on appropriate Quality Assurance/ Quality Control (QA/QC) procedures.
- > A discussion of analytical results in relation to the following:
  - Trends in PFAS concentrations, including an assessment of temporal changes and/or changes to the extent of PFAS impacts. Trends should be assessed using an appropriate statistical analysis approach (e.g. using Mann-Kendall or similar analysis), with a specified level of confidence based upon the number of monitoring rounds completed.
  - Consideration, based on data trends, as to whether any of the existing remediation / management measures should be re-assessed, with a view to potential modification, supplementation or cessation.
  - Assessment against the management response triggers and contingencies detailed in the OMP.
  - Assessment of whether changes to the CSM and/or risk assessment are required.
  - Whether recalibration or changes to the groundwater model are required to provide a better understanding of the potential future extent of PFAS impact in groundwater.



- 
- > Based on the data obtained, an assessment of the OMP sampling requirements with a view to establishing whether:
    - The number of locations monitored could be reduced, such as where PFAS concentrations are stable and are considered to present a low risk to receptors.
    - Additional monitoring locations are required, including the installation of new monitoring wells or sampling of additional existing wells (and/or private bores) to provide better understanding of the nature, extent or magnitude of PFAS impacts in a particular portion of the Management Area.
    - The frequency of monitoring should increase or decrease to provide better understanding of PFAS concentration fluctuations and potential risks to receptors.
    - Monitoring of additional media should be included in the OMP. *For example, if monitoring of surface water demonstrates a trend of increasing PFAS concentrations, or if concentrations significantly greater than those recorded in previous investigations are recorded, then the requirement to conduct monitoring of aquatic biota should be considered (DoD, 2019).*
  - > An overview of remedial works or construction and maintenance activities undertaken in the management area during the reporting period, which may impact the CSM.
  - > A statement as to whether the risk profile has changed overall, or for any specific location at the Site, and a recommendation as to whether this should trigger an OMP and/or PMAP review, or other action.

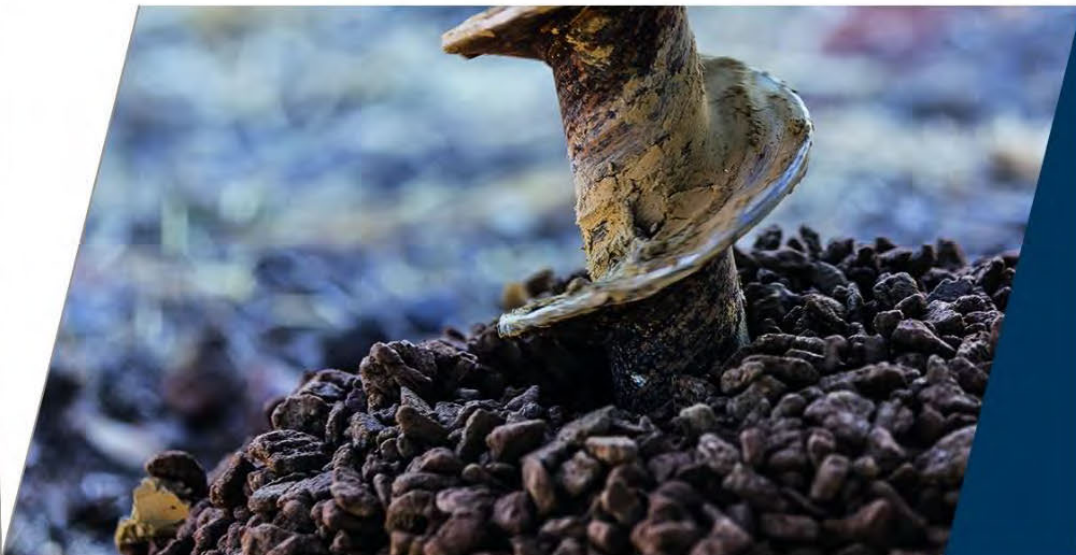
## 9 References

### General References

1. Australian Standard AS 4482-2005 Guide to the investigation and sampling of sites with potentially contaminated soils, Part 1 – Non-volatile and semi-volatile compounds.
2. Australian Water Quality Guidelines for Fresh and Marine Water Quality (ANZECC and ARMCANZ, 2000).
3. *Contaminated Sites Act 2003*, Western Australia.
4. Department of Defence, Department of Energy, 2018, Quality System Manual Schedule B15.
5. Department of the Environment and Energy (2017) in the National Greenhouse and Energy Reporting Scheme Measurement Technical Guidelines for the Estimation of Emissions by Facilities in Australia.
6. Department of Water and Environmental Regulation (DWER), 2021, *Assessment and Management of Contaminated Sites*.
7. Environmental Protection Agency (United States EPA), November 2002, Reference: EPA/240/R-02/004, 'Guidance on Environmental Data Verification and Data Validation'.
8. The Heads of EPAs Australia and New Zealand (HEPA; 2020) PFAS National Environmental Management Plan (NEMP) 2.0, January 2020.
9. National Environment Protection Council (NEPC), 1999, National Environmental Protection (Assessment of Site Contamination) Measure (as amended), registered May 2013.
10. National Health and Medical Research Council (NHMRC) (2011 – updated 2018) National Water Quality Management Strategy Australian Drinking Water Guidelines 6, August 2018
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### Site Specific References

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## APPENDIX

# A

## Figures



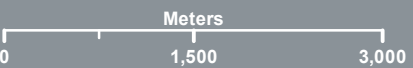


**Legend**

 Management Area

 RAAF Learmonth

FIGURE 1  
1:60,000 Scale at A3



## Site Location

SAMPLING AND ANALYSIS QUALITY PLAN  
RAAF BASE LEARMONTH  
DEPARTMENT OF DEFENCE



Map Produced by Cardno WA  
Date: 2021-05-13 | Project: DEF19009  
Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere  
Map: DEF19009\_WA\_0960-GS-001\_RegionalLocation 02.mxd  
Aerial Imagery Supplied by Google Earth

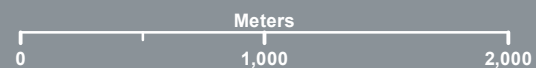




**Legend**

- Management Area
- Site Boundary
- Key PFAS Source Areas (GHD, 2019)

FIGURE 2  
1:31,000 Scale at A3



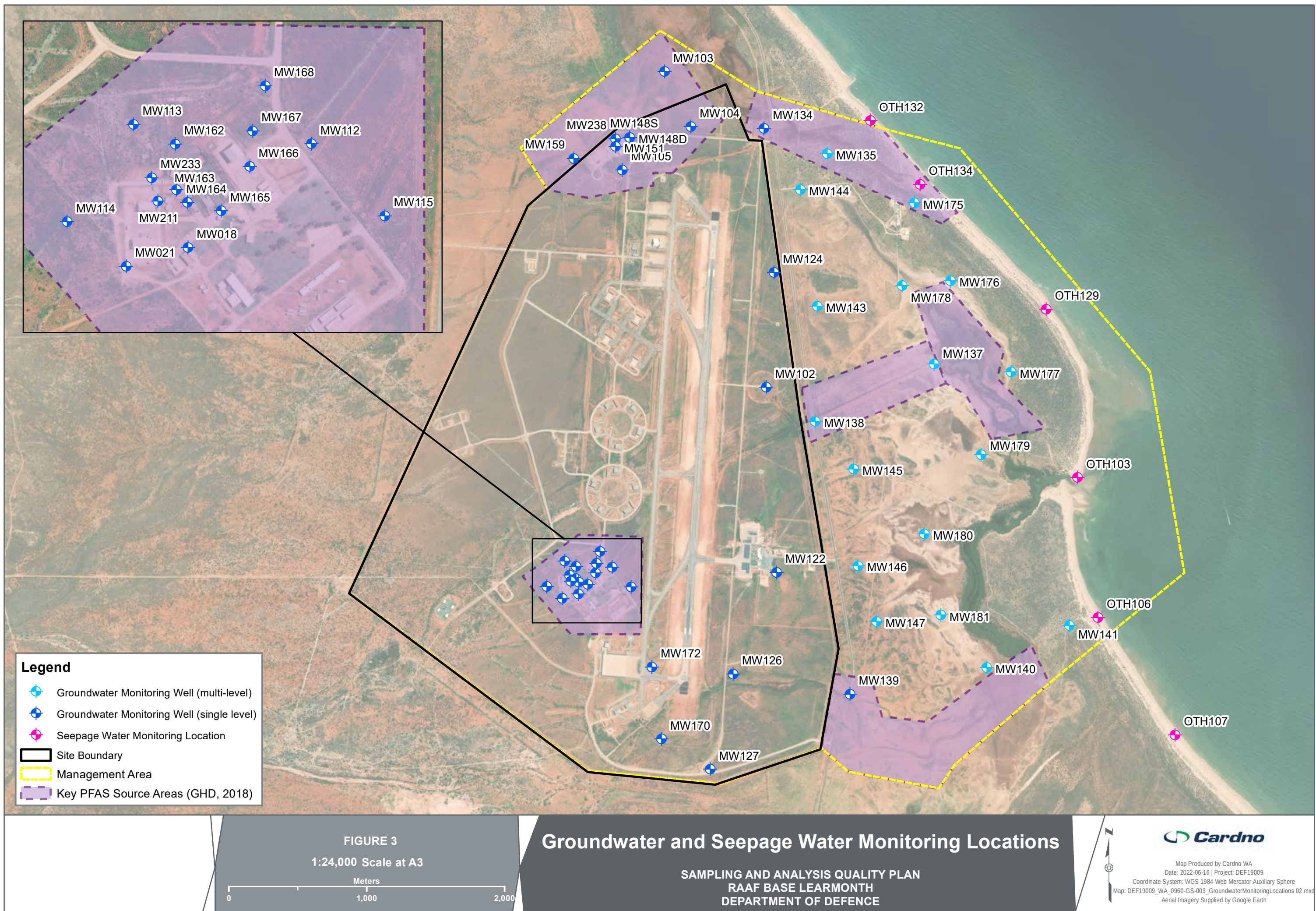
## Management Areas

SAMPLING AND ANALYSIS QUALITY PLAN  
RAAF BASE LEARMONTH  
DEPARTMENT OF DEFENCE



Map Produced by Cardno WA  
Date: 2021-06-14 | Project: DEF19009  
Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere  
Map: DEF19009\_WA\_0960-GS-002\_ManagementAreas 02.mxd  
Aerial Imagery Supplied by Google Earth







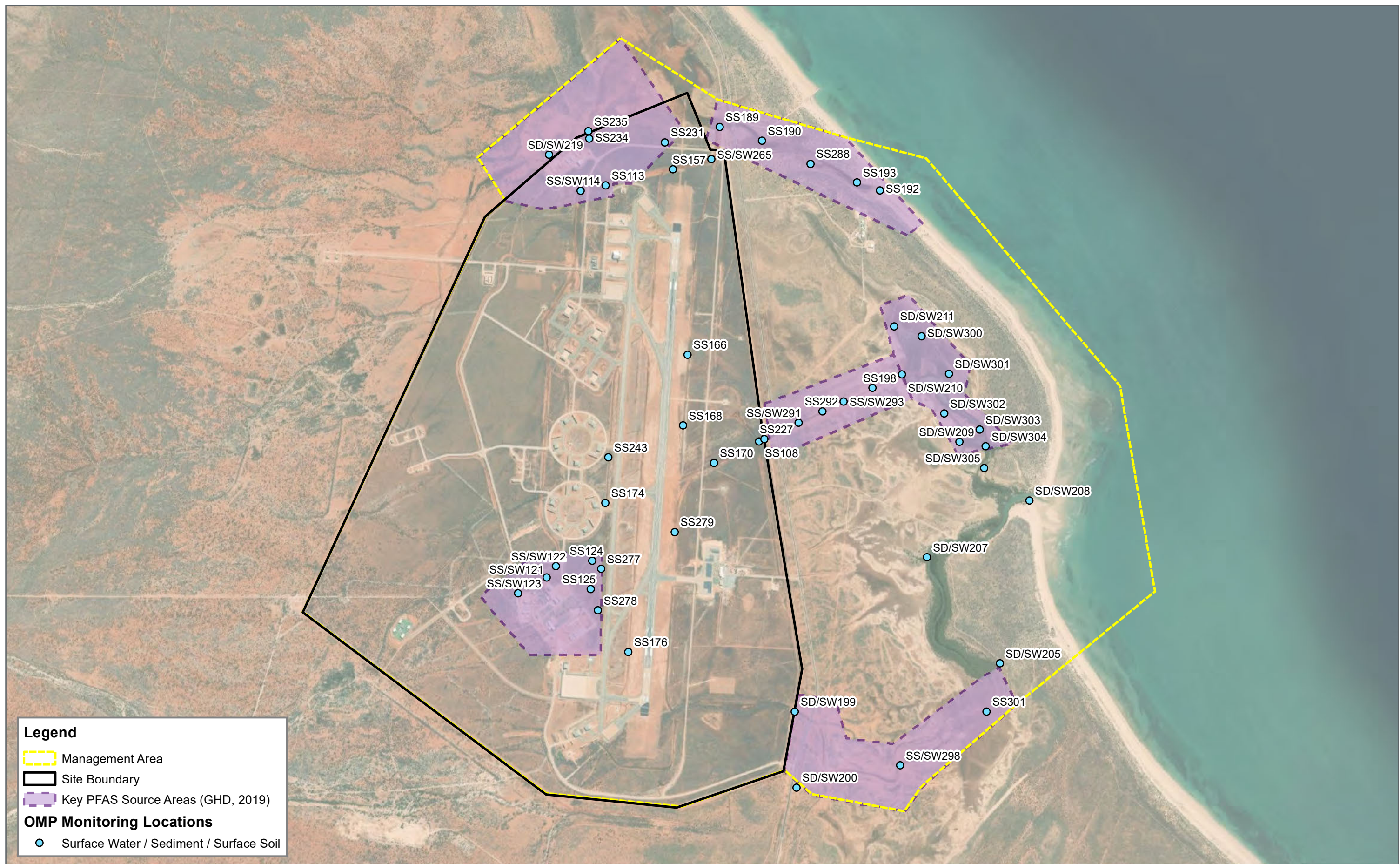
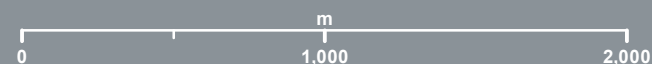


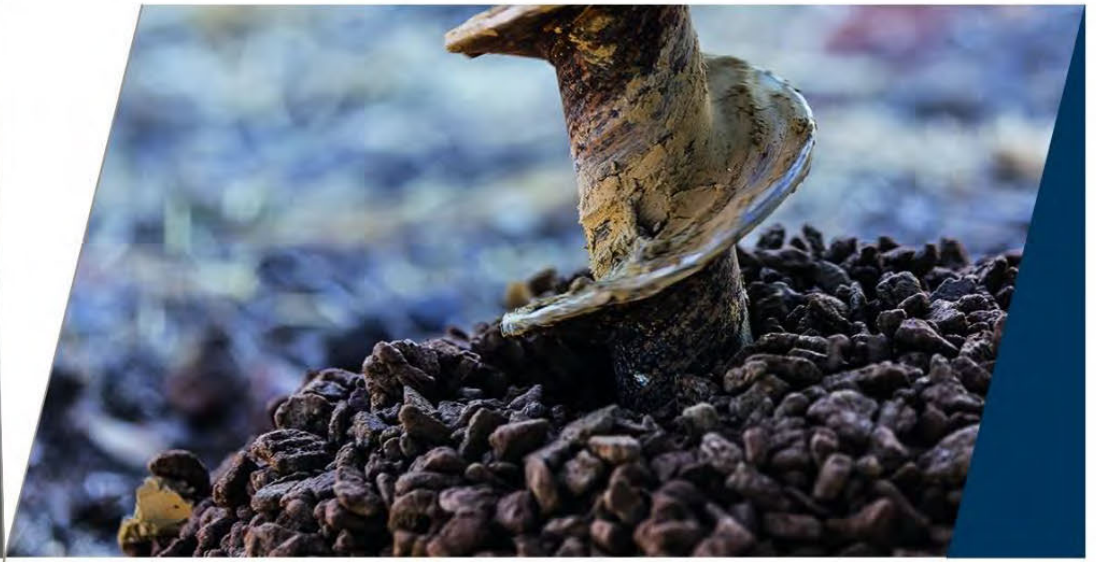
FIGURE 4  
1:25,000 Scale at A3



## Surface water and sediment monitoring locations

SAMPLING AND ANALYSIS QUALITY PLAN  
RAAF BASE LEARMONTH  
DEPARTMENT OF DEFENCE





## APPENDIX

# B

## Full PFAS Analytical Suite

## Full PFAS Analytical Suite

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





### About Cardno

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



APPENDIX

C

FACTUAL REPORTS



now



# PFAS OMP Biannual Monitoring Event Factual Report

November 2021

RAAF Learmonth

DEF19009



Prepared for  
Department of Defence

12 April 2022



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

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## Chemical Names

|       |                                            |
|-------|--------------------------------------------|
| DOC   | Dissolved Organic Carbon                   |
| DO    | Dissolved Oxygen                           |
| PFAS  | Per- and Poly-fluoroalkyl Substances       |
| PFHxS | Per-fluoro-hexane Sulphonate               |
| PFOA  | Per-fluoro-octanoic Acid                   |
| PFOS  | Per-fluoro-octane Sulfonate                |
| TDS   | Total Dissolved Solids (salinity of water) |
| TOC   | Total Organic Carbon                       |
| TSS   | Total Suspended Solids                     |

## Technical Terms

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

## Units

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

## Site Specific

|      |                           |
|------|---------------------------|
| OMP  | Ongoing Monitoring Plan   |
| FTG  | Fire Training Ground      |
| RAAF | Royal Australian Airforce |

# 1 Introduction

---

## 1.1 Background

Cardno was engaged by the Australian Department of Defence (“the Client”) to carry out the Per- and Poly-Fluoroalkyl Substances (PFAS) Ongoing Monitoring Plan (OMP) biannual sampling event at the Royal Australian Airforce (RAAF) Learmonth (“the Site”). The Site is located approximately 30 km south of Exmouth, WA (Figure 1, Appendix A).

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

- > Cardno, 14 June 2021, Reference: DEF19009, ‘*PFAS Ongoing Monitoring Plan Sampling and Analysis Quality Plan (SAQP) RAAF Base Learmonth*’.

The SAQP was reviewed prior to the monitoring event where it was determined that no updates were required.

For the purposes of this report:

- > “the Site” was defined as RAAF Base Learmonth.
- > “the Management Area” was defined as comprising the site, plus the land east of the Base, including the salt pan, drainage channels, Wapet Creek and extends to Exmouth Gulf (Figure 2, Appendix A).

## 1.2 Purpose & Objectives

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

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

The objectives of the report are:

- > To provide a succinct summary of the November 2021 sampling event and provision of analytical results with supporting tables and figures.
- > To provide confirmation of the current understanding of risk.
- > To provide supporting data for the assessment of management actions, where relevant.

## 1.3 Relevant Guidelines

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

- > National Environment Protection Council (NEPC), 1999, National Environmental Protection (Assessment of Site Contamination) Measure (as amended 2013) (ASC NEPM).
- > Heads of Environmental Protection Authority’s Australia and New Zealand (HEPA), January 2020, PFAS National Environmental Management Plan (NEMP) 2.0.
- > Australian Standard AS 4482-2005 Guide to the investigation and sampling of sites with potentially contaminated soils, Part 1 - Non-volatile and semi-volatile compounds.
- > Standards Australia 1998. AS/NZ 5667:1998 Water quality – sampling.
- > Australian and New Zealand Guidelines, 2018. Australian and New Zealand Guidelines for Fresh and Marine Water Quality.



- > Department of Environment and Regulation (DER), 2014, Assessment and Management of Contaminated Sites<sup>1</sup>.
- > Department of Defence, Department of Energy, 2018, Quality System Manual Schedule B15.
- > U.S. Environmental Protection Agency (EPA), 2000, 'Guidance for the Data Quality Objectives Process (EPA QA/G-4)'.
- > USEPA, 2002, 'Guidance on Environmental Data Verification and Data Validation (EPA QA/G-8)'.
- > National Health and Medical Research Council (NHMRC), August 2019, Guidance on Per and Polyfluoroalkyl Substances (PFAS) in Recreational Water.

## 2 Scope of Work

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

### 2.1 Groundwater Monitoring

Sampling of selected groundwater bores was performed in accordance with the SAQP, applying methods set out in Section 3 of this report. The groundwater bores monitored as part of the OMP are presented in Table 2-1, and are shown on Figure 4, Appendix A.

Table 2-1 Groundwater Monitoring Locations

| Monitoring Area                  | Location ID                                                                                                                                                                                                                                                             |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Source Area 1 – Maintenance Area | 0960_MW114, 0960_MW021, 0960_MW113, 0960_MW211, 0960_MW162, 0960_MW163, 0960_MW018, 0960_MW164, 0960_MW165, 0960_MW166, 0960_MW167, 0960_MW168, 0960_MW112, 0960_MW115., 0960_MW233                                                                                     |
| Source Area 2 – Fuel Farm        | 0960_MW016, 0960_MW105, 0960_MW148D, 0960_MW148S, 0960_MW151, 0960_MW159.                                                                                                                                                                                               |
| Pathway                          | 0960_MW122, 0960_MW146, 0960_MW147, 0960_MW180, 0960_MW181, 0960_MW172, 0960_MW170, 0960_MW127, 0960_MW126, 0960_MW139, 0960_MW140, 0960_MW102, 0960_MW138, 0960_MW145, 0960_MW103, 0960_MW104, 0960_MW134, 0960_MW135, 0960_MW175, 0960_MW124, 0960_MW144, 0960_MW143. |
| Receptor                         | 0960_MW137, 0960_MW176, 0960_MW177, 0960_MW178, 0960_MW179, 0960_MW141.                                                                                                                                                                                                 |

### 2.2 Seepage Water Monitoring

Sampling of selected seepage water monitoring locations was performed in accordance with the SAQP, applying methods set out in section 3 of this report. The seepage water locations monitored as part of the OMP are presented in Table 2-2 and are shown on Figure 4, Appendix A.

Table 2-2 Seepage Water Monitoring Locations

| Monitoring Area | Location ID                                                                   |
|-----------------|-------------------------------------------------------------------------------|
| Seepage         | 0960_OTH132, 0960_OTH134, 0960_OTH129, 0960_OTH103, 0960_OTH106, 0960_OTH107. |

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

## 2.3 Surface water Monitoring

Sampling of selected surface water monitoring locations was performed in accordance with the SAQP, applying methods set out in Section 3 of this report. The surface water locations monitored as part of the OMP are presented in Table 2-3 and are shown on Figure 5, Appendix A.

Table 2-3 Surface water Monitoring Locations

| Monitoring Area   | Location ID                                                                                                                                                                                                                                                 |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Drainage channels | SW219, SS234, SS235, SW114, SS113, SS231, SS157, SW265, SW189, SS190, SW288, SW193, SS192, SS198, SW293, SS292, SW291, SS227, SS108, SS170, SS168, SS279, SS166, SS243, SS174, SW121, SW122, SS124, SS277, SS125, SS278, SS176, SW123, SW199, SW200, SW298. |
| WAPET Creek       | SW211, SW300, SW210, SW001, SW302, SW303, SW209, SW304, SW305, SW207, SW208, SW205, SW301.                                                                                                                                                                  |

## 2.4 Sediment Monitoring

Sampling of selected sediment (or shallow soil if dry) monitoring locations was performed in accordance with the SAQP, applying methods set out in Section 3 of this report. The sediment locations monitored as part of the OMP are presented in Table 2-4 and are shown on Figure 6, Appendix A.

Table 2-4 Sediment Monitoring Locations

| Monitoring Area   | Location ID                                                                                                                                                                                                                                                 |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Drainage channels | SD219, SS234, SS235, SS114, SS113, SS231, SS157, SS265, SS189, SS190, SS288, SS193, SS192, SS198, SS293, SS292, SS291, SS227, SS108, SS170, SS168, SS279, SS166, SS243, SS174, SS121, SS122, SS124, SS277, SS125, SS278, SS176, SS123, SD199, SD200, SS298. |
| WAPET Creek       | SD211, SD300, SD210, SD301, SD302, SD303, SD209, SD304, SD305, SD207, SD208, SD205, SS301.                                                                                                                                                                  |

**Note:** 'SS' prefix indicates a shallow soil (dry) location, 'SD' prefix a sediment (wet) location

## 2.5 Data Management

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

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

### 2.5.1 Defence ESdat database

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

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

## 2.6 Deviations from the OMP SAQP

Deviations from the SAQP (Cardno, 2021) for the November 2021 monitoring event are presented in Table 2-5.

Table 2-5 Summary of deviations from the OMP SAQP

| Location                                                                                                                                                                                                                                                           | Deviation                       | Comments                                                                                                                                                                                                                                                           |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SW219, SS234, SS235, SW114, SS113, SS231, SS157, SW265, SW189, SS190, SW288, SW193, SS192, SS198, SW293, SS292, SW291, SS227, SS108, SS170, SS168, SS279, SS166, SS243, SS174, SW121, SW122, SS124, SS277, SS125, SS278, SS176, SW123, SW199, SW200, SW298, SW210. | Not sampled                     | These surface water monitoring locations were found dry                                                                                                                                                                                                            |
| MW016                                                                                                                                                                                                                                                              | Not sampled                     | MW016 was found filled with soil due to no gatic lid covering the well. MW238 was sampled instead as this well is also positioned down-gradient of the Fuel Farm (source area 2) and historical data is available as this location was sampled as part of the DSI. |
| SW205                                                                                                                                                                                                                                                              | Non-PFAS analytes not analysed. | Insufficient volume of water to collect all bottles. PFAS samples only. No field data was collected at this location as a result of the limited water volume.                                                                                                      |

## 3 Methodology

### 3.1 Groundwater Sampling Methodology

Groundwater monitoring was undertaken applying the methods detailed in Table 3-1.

Table 3-1 Groundwater Sampling Method

| Activity                                                                       | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Well Gauging                                                                   | Standing Water Level (SWL) were gauged using an interface probe. All wells were measured against a specified mark at the top of the well casing.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Groundwater Field Parameters                                                   | <p>Groundwater field parameters were recorded via a down-hole water quality meter (positioned within the mid screen interval) prior to deployment of HydraSleeves® or pre-sample collection. The following field parameters were recorded using a water quality meter:</p> <ul style="list-style-type: none"> <li>pH.</li> <li>electrical conductivity (EC).</li> <li>oxidation reduction potential (ORP).</li> <li>Dissolved oxygen (DO).</li> <li>Temperature.</li> </ul> <p>Once field parameters have stabilised (as indicated by at least three consecutive measurements falling within +/- 10% of each other) measurement were recorded on field data records.</p> <p>All field instruments (e.g. water quality meter) were calibrated by the equipment supplier and reading of reference solutions (bump tests) undertaken daily in the field to optimise the accuracy of the measurements taken. Calibration certificates and bump tests records are provided in Appendix D.</p> |
| Deployment and Retrieval of HydraSleeves (single level well sample collection) | <p>HydraSleeve were deployed with top weight sample collection to begin at the lowest point. HydraSleeve sampling devices were left in wells for a minimum of 24 hours to allow restabilisation of the well following the slight disturbance caused by sampler deployment.</p> <p>Samples were collected via continuous pull method at a rate allowing the water to pass through the check valve into the sample sleeve.</p> <p>Samples were discharged immediately (minimise changes in chemistry) via discharge tube.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                              |



| Activity                                                        | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                 | Following sampling, hydrasleeves were deployed in preparation for the next OMP monitoring event using the same string for consistency between event (same depth of sampling i.e. within screen).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Peristaltic pump (multi-level wells sample collection)          | <p>The shallowest (non-dry) wells were sampled at each multi-level well location, using Teflon-free dedicated and disposable high-density polyethylene (HDPE) tubing coupled to a peristaltic pump system. The groundwater was purged at a low flow rate of 0.2 mL/min.</p> <p>SWL and field parameters were measured during purging and post sample collection to ensure limited drawdown effects. The groundwater was sampled when the field parameters had stabilised.</p>                                                                                                                                                                                                                                                                                           |
| Decontamination procedure                                       | <p>Dedicated HydraSleeves/tubing were used at each groundwater bore thus removing the need for decontamination.</p> <p>All re-usable sampling equipment was thoroughly washed using PFAS &amp; phosphate-free detergent, then double rinsed with clean water before the sample collection.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Sample identification, preservation transport and holding times | <p>Each sample was labelled with the sample location, date, project identification number and sampler's initials.</p> <p>Samples were collected directly into appropriately preserved laboratory supplied bottles (Teflon-free) and packed in chilled containers for delivery to the laboratory under Chain of Custody (CoC) documentation.</p> <p>Sample containers, preservation procedures, sample storage requirements and holding times were undertaken in accordance with those recommended by Standards Australia (AS/NZS 5667.1:1998 and AS 4482.1 as appropriate).</p>                                                                                                                                                                                         |
| Laboratory Testing                                              | <p>Groundwater samples were submitted for the following analysis:</p> <ul style="list-style-type: none"> <li>Full PFAS analytical suite (refer to the SAQP for full list of analytes).</li> <li>Major anions and cations (include calcium, magnesium, sodium, potassium, chloride, sulfate, alkalinity and ionic balance).</li> <li>Dissolved organic carbon (DOC), total suspended solids (TSS), total dissolved solids (TDS) and pH.</li> </ul> <p>The primary laboratory was ALS Global Laboratories (Perth), and the secondary laboratory (quality control) was Eurofins (Perth). Both laboratories are NATA-accredited for the parameters tested. Copies of the NATA stamped laboratory reports and Chain of Custody documentation are included in Appendix D.</p> |
| Laboratory Testing – Quality Control                            | <p>Groundwater QC samples were collected at the following frequencies as detailed in the SAQP (Cardno, 2021):</p> <ul style="list-style-type: none"> <li>Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch is less than 10 samples.</li> <li>Field triplicate (inter-laboratory) samples at 1 per 10 water samples and sent to a secondary laboratory.</li> <li>Rinsate blank sample at 1 per day [collected off re-used sampling equipment (e.g. interface probe)].</li> <li>Field blank samples at 1 per day.</li> </ul>                                                                                                                                                                                               |

## 3.2 Seepage Water Sampling Methodology

Seepage water monitoring procedure is detailed in Table 3-2.

Table 3-2 Seepage water Sampling method

| Activity         | Details                                                                                                                                                                                                                                                                           |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Field parameters | <p>The following field parameters were recorded using a water quality meter:</p> <ul style="list-style-type: none"> <li>pH.</li> <li>electrical conductivity (EC).</li> <li>oxidation reduction potential (ORP).</li> <li>Dissolved oxygen (DO).</li> <li>Temperature.</li> </ul> |

| Activity                                                        | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                 | Field observations such as water flow, odours or sheen presence were also recorded on field sampling sheets.                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Sampling Method                                                 | Sampling was carried out in a two-hour period; one hour each side of the low tide. Sampling protocol involved a shallow excavation in the beach sand; just above where inundation by wave action is occurring.<br>Sampling containers were lowered into the exposed seepage water and filled.                                                                                                                                                                                                                                                                        |
| Decontamination procedure                                       | All re-usable sampling equipment was thoroughly washed using PFAS & phosphate-free detergent, then double rinsed with clean water before the sample collection.                                                                                                                                                                                                                                                                                                                                                                                                      |
| Sample identification, preservation transport and holding times | Each sample was labelled with the sample location, date, project identification number and sampler's initials.<br>Samples were collected directly into appropriately preserved laboratory supplied bottles (Teflon-free) and packed in chilled containers for delivery to the laboratory under CoC documentation.<br>Sample containers, preservation procedures, sample storage requirements and holding times were undertaken in accordance with those recommended by Standards Australia (AS/NZS 5667.1:1998 and AS 4482.1 as appropriate).                        |
| Laboratory Testing                                              | Seepage water samples were submitted for the following analysis: <ul style="list-style-type: none"> <li>Full PFAS analytical suite (refer to the SAQP for full list of analytes).</li> <li>Major anions and cations (include calcium, magnesium, sodium, potassium, chloride, sulfate, alkalinity and ionic balance).</li> </ul>                                                                                                                                                                                                                                     |
| Laboratory Testing – Quality Control                            | Seepage water QC samples were collected at the following frequencies as detailed in the SAQP (Cardno, 2021): <ul style="list-style-type: none"> <li>Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch is less than 10 samples.</li> <li>Field triplicate (inter-laboratory) samples at 1 per 10 water samples and sent to a secondary laboratory.</li> <li>Rinsate blank sample at 1 per day [collected off re-used sampling equipment (e.g. interface probe)].</li> <li>Field blank samples at 1 per day.</li> </ul> |

### 3.3 Surface Water Sampling Methodology

Surface water monitoring procedure is detailed in Table 3-3.

Table 3-3 Surface water Sampling Method

| Activity                  | Details                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Field parameters          | The following field parameters were recorded using a water quality meter: <ul style="list-style-type: none"> <li>pH.</li> <li>electrical conductivity (EC).</li> <li>oxidation reduction potential (ORP).</li> <li>Dissolved oxygen (DO).</li> <li>Temperature.</li> </ul> Field observations such as water flow, odours or sheen presence were also recorded on field sampling sheets. |
| Sampling Method           | Surface water samples were collected directly into sample containers using a 'Grab' (manual) sample method via a long handled sampling device.<br>Where depth permits, the sample container was positioned at least 10 cm below the surface water level and above the sediment bed and oriented with the capped opening facing downwards to avoid the collection of surface films.      |
| Decontamination procedure | All re-usable sampling equipment was thoroughly washed using PFAS & phosphate-free detergent, then double rinsed with clean water before the sample collection.                                                                                                                                                                                                                         |

| Activity                                                        | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sample identification, preservation transport and holding times | <p>Each sample was labelled with the sample location, date, project identification number and sampler's initials.</p> <p>Samples were collected directly into appropriately preserved laboratory supplied bottles (Teflon-free) and packed in chilled containers for delivery to the laboratory under CoC documentation.</p> <p>Sample containers, preservation procedures, sample storage requirements and holding times were undertaken in accordance with those recommended by Standards Australia (AS/NZS 5667.1:1998 and AS 4482.1 as appropriate).</p>                |
| Laboratory Testing                                              | <p>Surface water samples were submitted for the following analysis:</p> <ul style="list-style-type: none"> <li>Full PFAS analytical suite (refer to the SAQP for full list of analytes).</li> <li>Major anions and cations (include calcium, magnesium, sodium, potassium, chloride, sulfate, alkalinity and ionic balance).</li> </ul>                                                                                                                                                                                                                                     |
| Laboratory Testing – Quality Control                            | <p>Surface water QC samples were collected at the following frequencies as detailed in the SAQP (Cardno, 2021):</p> <ul style="list-style-type: none"> <li>Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch is less than 10 samples.</li> <li>Field triplicate (inter-laboratory) samples at 1 per 10 water samples and sent to a secondary laboratory.</li> <li>Rinsate blank sample at 1 per day [collected off re-used sampling equipment (e.g. interface probe)].</li> <li>Field blank samples at 1 per day.</li> </ul> |

### 3.4 Sediment Sampling Methodology

Sediment sampling methodology is detailed in Table 3-4.

Table 3-4 Sediment Sampling Method

| Activity                             | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sample Collection                    | <p>Sediment samples were collected at the sediment/water interface using hand tools (e.g. trowel, hand auger, PVC pipe etc.) with samples placed directly into appropriately labelled, laboratory supplied sample containers and packed in chilled containers for delivery to the laboratory under CoC documentation.</p> <p>At each sampling location, the sediment sample was visually assessed and observations (including physical description) recorded on field data sheets.</p>                                                                                                  |
| Field Records                        | <p>The following information was recorded on the field data sheets:</p> <ul style="list-style-type: none"> <li>Sampling time, date and name of the sampler.</li> <li>Weather conditions.</li> <li>Sample Collection method.</li> <li>Sampling equipment decontamination procedures where non-disposable sampling equipment is utilised.</li> </ul>                                                                                                                                                                                                                                      |
| Decontamination                      | <p>All re-usable sampling equipment was thoroughly washed using PFAS &amp; phosphate-free detergent, then double rinsed with clean water before the sample collection.</p>                                                                                                                                                                                                                                                                                                                                                                                                              |
| Laboratory Testing                   | <p>Sediment samples were submitted for the following analysis:</p> <ul style="list-style-type: none"> <li>Full PFAS analytical suite (refer to the SAQP for full list of analytes).</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                          |
| Laboratory Testing – Quality Control | <p>Sediment QC samples were collected at the following frequencies as detailed in the SAQP (Cardno, 2021):</p> <ul style="list-style-type: none"> <li>Field duplicate (intra-laboratory) samples greater than 1 per 20 sediment samples or 1 per batch if the batch is less than 20 samples.</li> <li>Field triplicate (inter-laboratory) samples greater than 1 per 20 sediment samples and sent to a secondary laboratory.</li> <li>Rinsate blank sample at 1 per day [collected off re-used sampling equipment (e.g. trowel)].</li> <li>Field blank samples at 1 per day.</li> </ul> |



### 3.5 Quality Control / Quality Assurance

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

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

A detailed review of these aspects has been undertaken, the results of which are presented in Appendix E.

The QA/QC review concluded that there are no significant systematic errors in the data collection process and therefore, the dataset used for the assessment is considered valid and complete.

### 3.6 Assessment Criteria

#### 3.6.1 Groundwater, Seepage water and surface water

The adopted assessment criteria for groundwater are detailed in Table 3-5.

Table 3-5 Criteria for groundwater, seepage water and surface water

| Exposure Scenario                   | Adopted Assessment Criteria |      | Guidance              |
|-------------------------------------|-----------------------------|------|-----------------------|
|                                     | PFHxS / PFOS<br>µg/L        | PFOA |                       |
| Human Health – Recreational Water   | 2 <sup>1</sup>              | 10   | NHMRC 2019, HEPA 2020 |
| Ecological – 99% species protection | 0.00023 <sup>2</sup>        | 19   | HEPA 2020             |

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

#### 3.6.2 Sediment

The adopted assessment criteria for sediment are detailed in Table 3-6.

Table 3-6 Criteria for Sediment

| Exposure Scenario                                           | Adopted Assessment Criteria |      | Guidance  |
|-------------------------------------------------------------|-----------------------------|------|-----------|
|                                                             | PFHxS / PFOS<br>mg/kg       | PFOA |           |
| Human Health - Commercial / industrial (on-base activities) | 20 <sup>1</sup>             | 50   | HEPA 2020 |
| Ecological – Direct exposure (interim guidelines)           | 1 <sup>2</sup>              | 10   | HEPA 2020 |
| Ecological - indirect exposure (interim guidelines)         | 0.01 <sup>2</sup>           | -    | HEPA 2020 |

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

## 4 Field Observations and Results

### 4.1 General Site Observations

The Site experienced above average rainfall for the month of November 2021, however, the northern and southern off-site drainage channels were dry. None of the groundwater monitoring wells were found dry during the November 2021 monitoring event, conducted 24-25 November 2021.

### 4.2 Groundwater

#### 4.2.1 Summary of Field Observations

##### 4.2.1.1 Physicochemical parameters

Stabilised physicochemical parameters, water colour and turbidity observations recorded during the groundwater sampling program are presented in field sampling records, included in Appendix D. Groundwater was fresh to hyper saline (TDS ranging from 1,111.5 mg/L to 67,080 mg/L), slightly acidic to slightly alkaline (pH ranging 6.84 to 8.43). Groundwater temperature was on average 29.1°C, DO readings mostly indicate aerobic groundwater condition (DO ranging from 0.67 mg/L to 38.4 mg/L). Field parameters were generally consistent with the previous monitoring event.

##### 4.2.1.2 Groundwater Elevation and Migration

Well gauging was undertaken over two days and several tide cycles which has been considered when interpreting inferred groundwater contours and flow direction.

Groundwater elevation ranged from -0.06 mAHD (MW103) to 1.2 mAHD (MW144). Depth to groundwater was observed to range approximately between 1 meter below ground level (mbgl) and 6 mbgl.

Groundwater flow beneath the Base was interpreted to be generally easterly, towards the Exmouth Gulf, consistent with the previous monitoring events. Groundwater is inferred to flow towards an area of groundwater depression that lies between the Base and the coast. Groundwater elevation in wells closer to the shore might be influenced by tidal effects.

Groundwater elevation contours and flow direction are shown in Figure 3, Appendix A. Gauging records are presented in Appendix D.

#### 4.2.2 Groundwater Laboratory Results

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

Table 4-1 Summary of Groundwater Results Exceeding Adopted Criteria

| Analytes              | Locations Exceeding Criteria                                                                                                                                              | Lowest Criteria (µg/L) | Max Conc. (µg/L) | No. Analytical Results <sup>1</sup> | No. Results Above Criteria |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|------------------|-------------------------------------|----------------------------|
| PFOA                  | -                                                                                                                                                                         | 10 <sup>2</sup>        | 4.42 (MW238)     | 49                                  | 0                          |
| PFOS                  | MW238, MW018, MW021, MW103, MW105, MW112, MW115, MW135, MW138, MW148D, MW148S, MW151, MW162, MW163, MW164, MW165, MW166, MW167, MW168, MW172, MW176, MW177, MW211, MW233. | 0.01 <sup>3</sup>      | 42.9 (MW238)     | 49                                  | 24                         |
| Sum of PFHxS and PFOS | MW018, MW148D, MW148S, MW151, MW162, MW163, MW164,                                                                                                                        | 2 <sup>2</sup>         | 87.7 (MW238)     | 49                                  | 12                         |

| Analytes | Locations Exceeding Criteria      | Lowest Criteria (µg/L) | Max Conc. (µg/L) | No. Analytical Results <sup>1</sup> | No. Results Above Criteria |
|----------|-----------------------------------|------------------------|------------------|-------------------------------------|----------------------------|
|          | MW167, MW172, MW211, MW233, MW238 |                        |                  |                                     |                            |

**Notes:**

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

Findings are summarised as follows:

- > There was no first time detection of PFOA or the sum of PFOS and PFHxS for any of the groundwater monitoring locations.
- > No new exceedance of a guideline value was reported for any of the groundwater monitoring locations.

## 4.3 Seepage Water

### 4.3.1 Summary of Field Observations

Stabilised physiochemical parameters, water colour and turbidity observations recorded during the groundwater sampling program are presented in field sampling record sheets, included in Appendix D. Seepage water temperature was on average 29.7°C, DO readings indicate aerobic conditions, pH was near neutral to slightly alkaline and TDS indicates saline water. Field parameters were generally consistent with the previous monitoring event.

### 4.3.2 Laboratory Results

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

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

| Analytes              | Locations Exceeding Criteria | Lowest Criteria (µg/L) | Max Conc. (µg/L) | No. Analytical Results <sup>1</sup> | No. Results Above Criteria |
|-----------------------|------------------------------|------------------------|------------------|-------------------------------------|----------------------------|
| PFOA                  | -                            | 10 <sup>2</sup>        | <0.01            | 6                                   | 0                          |
| PFOS                  | -                            | 0.01 <sup>3</sup>      | <0.01            | 6                                   | 0                          |
| Sum of PFHxS and PFOS | -                            | 2 <sup>2</sup>         | <0.01            | 6                                   | 0                          |

**Notes:**

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

Findings are summarised as follows:

- > All seepage water samples analysed reported PFAS concentrations below the laboratory LOR.
- > There was no first time detect of PFOA or Sum of PFOS and PFHxS or new exceedance of guideline values at the seepage water monitoring locations during the November 2021 monitoring event.



## **4.4 Surface water**

### **4.4.1 Summary of Field Observations**

Stabilised physiochemical parameters, water colour and turbidity observations recorded during the groundwater sampling program are presented in field sampling record sheets, included in Appendix D. Field parameters were generally consistent with the previous monitoring events. pH was near neutral, water condition was aerobic and hyper saline (TDS ranging from 37,505 to 81,620 mg/L).

### **4.4.2 Laboratory Results**

The results of laboratory analysis have been compared against adopted assessment criteria. Tabulated analytical results including non-PFAS analytes are provided within Appendix B. A summary of results exceeding the adopted criteria is presented in Table 4-3. Laboratory results have also been compared to available historical data in order to identify monitoring wells where a first-time detection of Sum of PFOS and PFHxS or PFOA; or a new exceedance of guideline values were reported. Figure 5 in Appendix A presents the surface water monitoring locations. The laboratory reports are provided in Appendix C.

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

| Analytes              | Locations Exceeding Criteria | Lowest Criteria (µg/L) | Max Conc. (µg/L) | No. Analytical Results <sup>1</sup> | No. Results Above Criteria |
|-----------------------|------------------------------|------------------------|------------------|-------------------------------------|----------------------------|
| PFOA                  | -                            | 10 <sup>2</sup>        | <0.01            | 12                                  | 0                          |
| PFOS                  | -                            | 0.01 <sup>3</sup>      | <0.01            | 12                                  | 0                          |
| Sum of PFHxS and PFOS | -                            | 2 <sup>2</sup>         | <0.01            | 12                                  | 0                          |

**Notes:**

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

Findings are summarised as follows:

- > None of the surface water samples reported PFAS concentrations above the laboratory LOR.
- > No first time detect of PFOA or Sum of PFOS and PFHxS or new exceedance of a guideline value were reported for the surface water monitoring locations during the November 2021 monitoring event.

## 4.5 Sediment

### 4.5.1 Summary of Field Observations

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

### 4.5.2 Laboratory Results

The results of laboratory analysis have been compared against adopted assessment criteria. Tabulated analytical results including non-PFAS analytes are provided within Appendix B. Soil criteria are adopted in the absence of criteria for sediment for consistency with the SAQP (Cardno, June 2021), DSI (GHD, 2018) and ERA (GHD, 2019). A summary of results exceeding the adopted criteria is presented in Table 4-4. Laboratory results have also been compared to available historical data in order to identify monitoring wells where a first-time detection of Sum of PFOS and PFHxS or PFOA; or a new exceedance of guideline values were reported. Figure 6 in Appendix A presents the sediment monitoring locations.

Table 4-4 Summary of Sediment Results Exceeding Adopted Criteria

| Analytes              | Locations Exceeding Criteria                                                              | Lowest Criteria (mg/kg) | Max Conc. (mg/kg) | No. Analytical Results <sup>1</sup> | No. Results Above Criteria |
|-----------------------|-------------------------------------------------------------------------------------------|-------------------------|-------------------|-------------------------------------|----------------------------|
| PFOA                  | -                                                                                         | 10 <sup>2</sup>         | 0.0008 (SS234)    | 49                                  | 0                          |
| PFOS                  | SS121, SS122, SS123, SS124, SS174, SS189, SS190, SS227, SS231, SS234, SS235, SS265, SS277 | 0.01 <sup>3</sup>       | 0.245 (SS174)     | 49                                  | 13                         |
| Sum of PFHxS and PFOS | -                                                                                         | 20 <sup>4</sup>         | 0.245 (SS174)     | 49                                  | 0                          |

**Notes:**

1. Non-inclusive of quality control samples
2. Ecosystems – all land uses – Direct exposure (HEPA, 2020)
3. Ecosystems – all land uses – Indirect exposure (HEPA, 2020)
4. Human health – Commercial/Industrial (HEPA, 2020)

Findings are summarised as follows:

- > None of the sediment samples reported a new exceedance of guideline values.

- > No first time detection of PFOA or the sum of PFOS and PFHxS were reported at any of the sediment monitoring locations during November 2021.

## 4.6 Changes to the Monitoring Network Condition

It is noted that bore MW016 is filled with soil and can no longer be sampled for groundwater. As noted above, MW238 was sampled in place of MW016 as it is also located down-gradient of the source area 2 (Fuel Farm). No other changes to the monitoring network condition were noted during this sampling event.

## 5 Summary and Conclusions

Cardno undertook the November 2021 groundwater, seepage water, surface water and sediment monitoring event at RAAF Base Learmonth as part of the PFAS OMP. Groundwater sampling and testing was undertaken at 49 monitoring bores, 12 surface water locations, six (6) seepage water locations and 49 sediment monitoring locations. 37 surface water monitoring locations could not be sampled as these were found dry.

Groundwater levels were gauged in all wells before sampling. Groundwater is inferred to flow towards an area of groundwater depression that lies between the Base and the coast.

The groundwater laboratory results reported the following:

- > Of the 49 samples that were tested, PFOS (24 samples) and Sum of PFHxS and PFOS (12 samples) reported concentrations that exceeded the HEPA (2020) ecological guideline value for 99% protection species and HEPA (2020) guideline value for recreational use respectively.
- > There was no first time detection of PFOA or the sum of PFOS and PFHxS for any of the groundwater monitoring locations.
- > No new exceedance of a guideline value was reported for any of the groundwater monitoring locations.

The seepage water laboratory results reported the following:

- > All seepage water samples analysed reported PFAS concentrations below the laboratory LOR.
- > There was no first time detect of PFOA or Sum of PFOS and PFHxS or new exceedance of guideline values at the seepage water monitoring locations during the November 2021 monitoring event.

The surface water laboratory results reported the following:

- > All 12 surface water samples that were tested, reported concentrations below LOR for all criteria.
- > No first time detect of PFOA or Sum of PFOS and PFHxS or new exceedance of a guideline value were reported for the surface water monitoring locations during the November 2021 monitoring event.

The sediment laboratory results reported the following:

- > Of the 49 sediment samples that were tested, PFOS (13 samples) reported concentrations that exceeded the HEPA (2020) ecological indirect exposure criteria.
- > No first time detection of PFOA or the sum of PFOS and PFHxS or new exceedances of guidelines were reported at any of the sediment monitoring locations during November 2021.

PFAS concentrations were generally within the historical range for all media sampled.

It is recommended that bore MW238 continue to be monitored in place of MW016.

The next OMP sampling event for RAAF Base Learmonth will be the 2022 first flush monitoring event.



## 6 References

### General References

1. Australian Standard AS 4482-2005 Guide to the investigation and sampling of sites with potentially contaminated soils, Part 1 – Non-volatile and semi-volatile compounds.
2. Australian Standard AS 4482-1999 Guide to the investigation and sampling of sites with potentially contaminated soils, Part 2 – Volatile substances.
3. Australian Water Quality Guidelines for Fresh and Marine Water Quality (ANZECC and ARMCANZ, 2000).
4. *Contaminated Sites Act 2003*, Western Australia.
5. Department of Defence, May 2021, PFAS OMP Factual Report Guidance Version 0.2.
6. Department of Defence, July 2018 amended August 2019, *Contamination Management Manual*, Annex L *Guidance on Data Management*.
7. Department of the Environment and Energy (2017) in the National Greenhouse and Energy Reporting Scheme Measurement Technical Guidelines for the Estimation of Emissions by Facilities in Australia.
8. Department of Environment Regulation (DER), 2014, *Assessment and Management of Contaminated Sites*.
9. Department of Water and Environment Regulation (DWER), 2018, Perth Groundwater Atlas, (<https://maps.water.wa.gov.au/#/webmap/gwm>).
10. Environmental Protection Agency (United States EPA), November 2002, Reference: EPA/240/R-02/004, 'Guidance on Environmental Data Verification and Data Validation'.
11. The Heads of EPAs Australia and New Zealand (HEPA; 2020) PFAS National Environmental Management Plan (NEMP) 2.0, January 2020.
12. National Environment Protection Council (NEPC), 1999, National Environmental Protection (Assessment of Site Contamination) Measure (as amended), registered May 2013.
13. National Health and Medical Research Council (NHMRC) (2011, as updated 2018) National Water Quality Management Strategy Australian Drinking Water Guidelines 6, August 2018
14. NHMRC, August 2019, Guidance on Per and Polyfluoroalkyl Substances (PFAS) in Recreational Water.
15. Standards Australia/Standards New Zealand (1998) AS5667.1:1998 'Water Quality – Sampling, Part 1: Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples'.
16. U.S. Environmental Protection Agency (EPA), 2000, 'Guidance for the Data Quality Objectives Process (EPA QA/G-4)'.
17. USEPA, 2002, 'Guidance on Environmental Data Verification and Data Validation (EPA QA/G-8)'.

### Site Specific References

18. Cardno, July 2021, PFAS OMP 2020 Annual Interpretive Report, RAAF Base Learmonth
19. Cardno, June 2021, Reference: DEF19009, 'PFAS Ongoing Monitoring Plan Sampling and Analysis Quality Plan (SAQP) RAAF Base Learmonth'.
20. Cardno, May 2021, PFAS OMP First Flush Sampling Event Factual Report RAAF Base Learmonth
21. Cardno, February 2021, OMP Biannual Monitoring Event Factual Report RAAF Base Learmonth
22. Cardno, July 2020, PFAS OMP First Flush Sampling Event Factual Report RAAF Base Learmonth
23. Cardno, April 2020, PFAS OMP Biannual Monitoring Event Factual Report RAAF Base Learmonth
24. Department of Defence, May 2019, RAAF Base Learmonth PFAS Ongoing Monitoring Plan.
25. GHD, December 2018, RAAF Base Learmonth – PFAS Investigations – Preliminary and Detailed Site Investigation Report.
26. GHD, April 2019, RAAF Base Learmonth – PFAS Investigations – Ecological Risk Assessment Preliminary (ERA).

APPENDIX

A

FIGURES



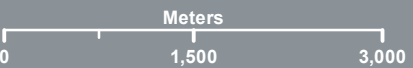


**Legend**

 Management Area

 RAAF Learmonth

FIGURE 1  
1:60,000 Scale at A3



## Site Location

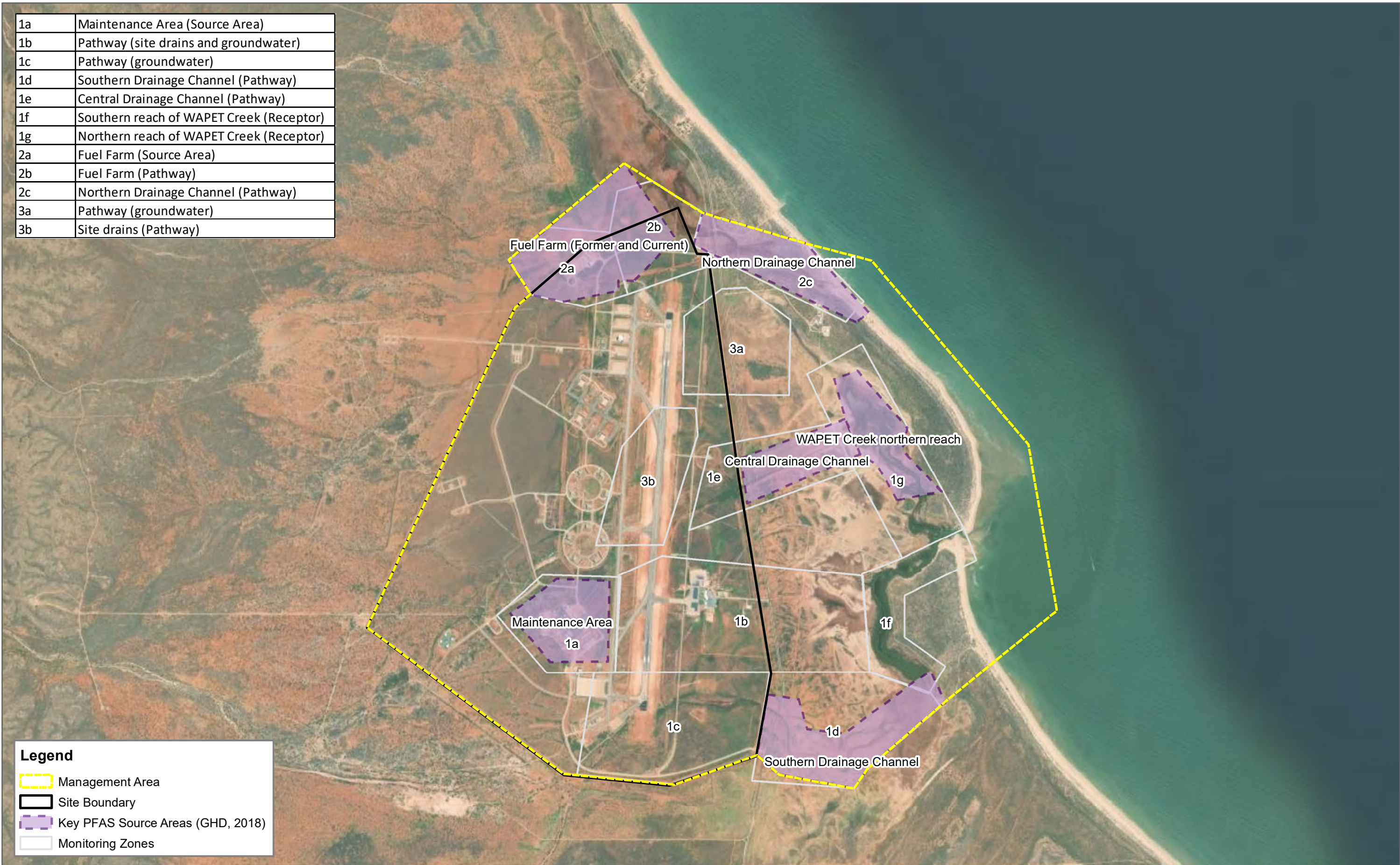
BIANNUAL INTERPRETIVE REPORT  
RAAF BASE LEARMONTH  
DEPARTMENT OF DEFENCE



Map Produced by Cardno WA  
Date: 2021-12-22 | Project: DEF19009  
Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere  
Map: DEF19009\_WA\_0960-GS-001\_RegionalLocation 02.mxd  
Aerial Imagery Supplied by Google Earth



|    |                                          |
|----|------------------------------------------|
| 1a | Maintenance Area (Source Area)           |
| 1b | Pathway (site drains and groundwater)    |
| 1c | Pathway (groundwater)                    |
| 1d | Southern Drainage Channel (Pathway)      |
| 1e | Central Drainage Channel (Pathway)       |
| 1f | Southern reach of WAPET Creek (Receptor) |
| 1g | Northern reach of WAPET Creek (Receptor) |
| 2a | Fuel Farm (Source Area)                  |
| 2b | Fuel Farm (Pathway)                      |
| 2c | Northern Drainage Channel (Pathway)      |
| 3a | Pathway (groundwater)                    |
| 3b | Site drains (Pathway)                    |





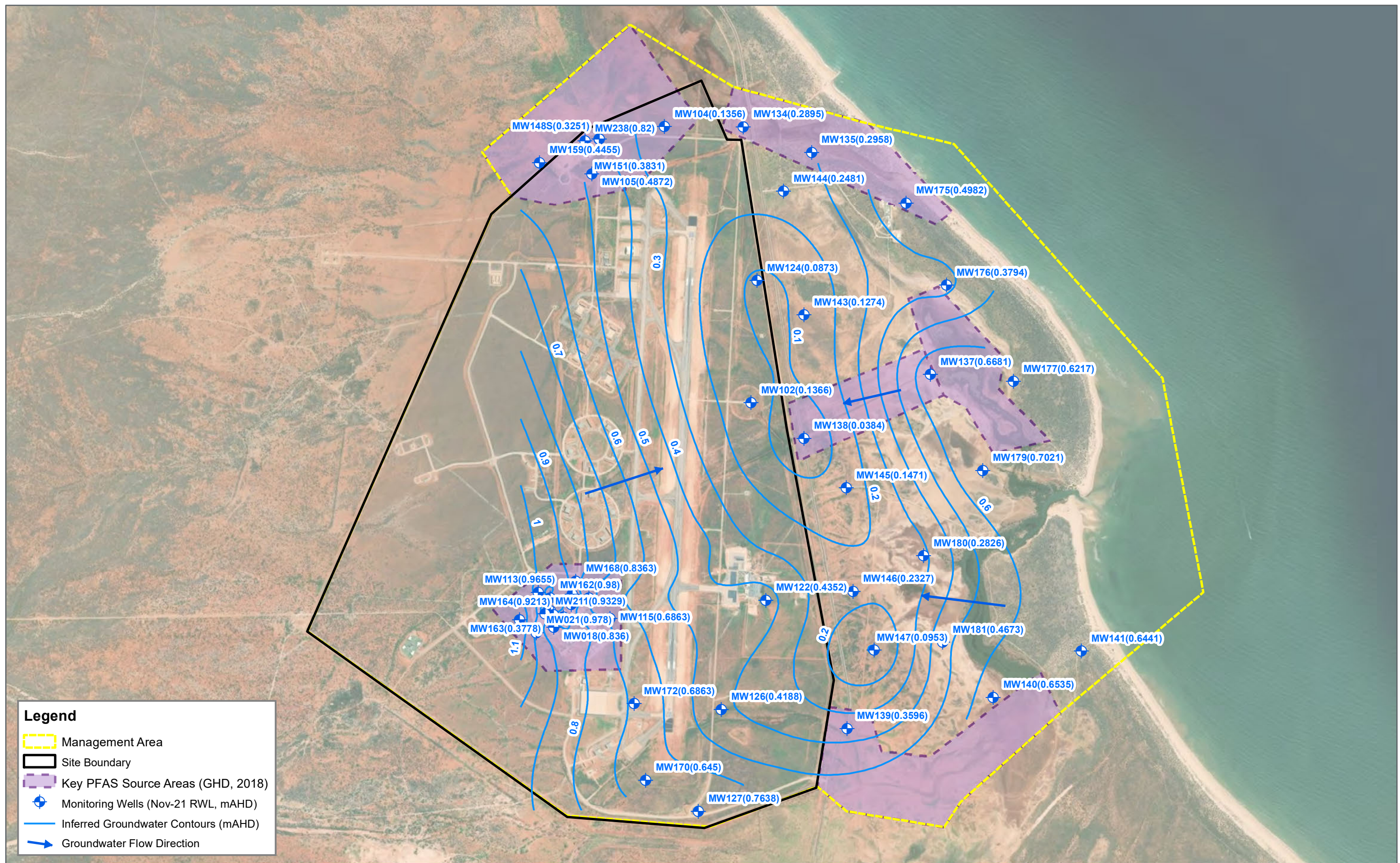


FIGURE 3  
1:22,000 Scale at A3

Meters  
0 750 1,500

## Inferred Groundwater Contours

BIANNUAL SAMPLING EVENT  
RAAF BASE LEARMONTH  
DEPARTMENT OF DEFENCE



Map Produced by Cardno WA  
Date: 2022-03-28 | Project: DEF19009  
Coordinate System: GDA 1994 MGA Zone 50  
Map: DEF19009\_WA\_0960-GS-003\_GroundwaterElevationContours 01.mxd  
Aerial Imagery Supplied by Google Earth



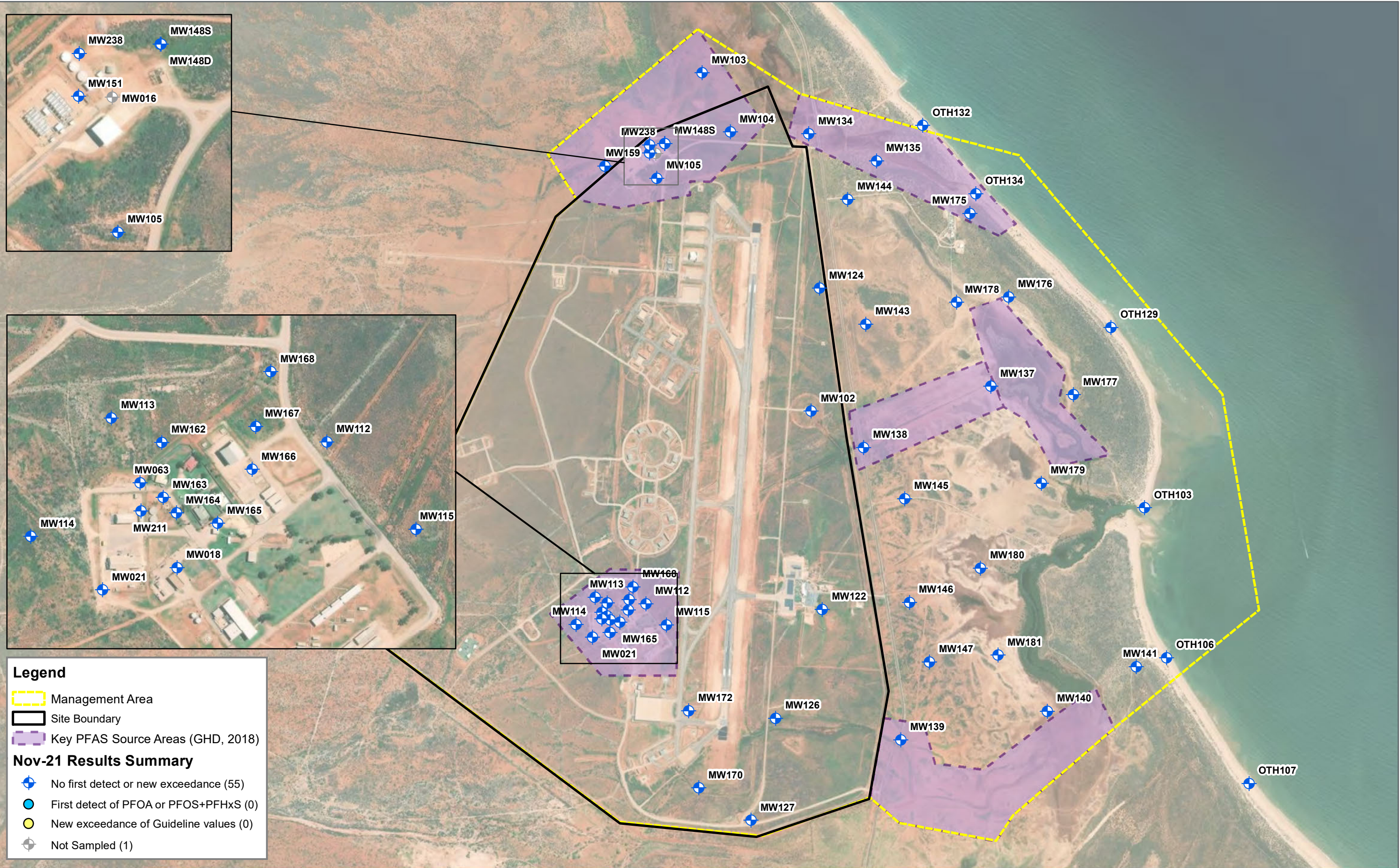
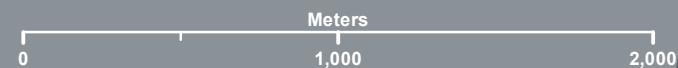


FIGURE 4  
1:24,000 Scale at A3



## Groundwater & Seepage water Monitoring Locations and Results

BIANNUAL SAMPLING EVENT  
RAAF BASE LEARMONTH  
DEPARTMENT OF DEFENCE



**Cardno**

Map Produced by Cardno WA  
Date: 2022-01-14 | Project: DEF19009  
Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere  
Map: DEF19009\_WA\_0960-GS-004\_GWResults\_Nov21 01.mxd  
Aerial Imagery Supplied by Google Earth











APPENDIX

# B

DATA ASSESSMENT TABLES



|                                   |  | PFAS - Perfluoroalkyl Sulfonic Acids |                                        |                                       |                                        |                                      |                                      | PFAS - Perfluoroalkyl Carboxylic Acids |                                 |                                |                                 |                               |                               |                               |                                   |                                  | PFAS - (n:2) Fluorotelomer Sulfonic Acids |                                      |                                           |                                           | PFAS - Perfluoroalkyl Sulfonamides        |                                             |                                    |                                               |                                                          |                                                      |                                              |                                                         |                                                     |
|-----------------------------------|--|--------------------------------------|----------------------------------------|---------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|----------------------------------------|---------------------------------|--------------------------------|---------------------------------|-------------------------------|-------------------------------|-------------------------------|-----------------------------------|----------------------------------|-------------------------------------------|--------------------------------------|-------------------------------------------|-------------------------------------------|-------------------------------------------|---------------------------------------------|------------------------------------|-----------------------------------------------|----------------------------------------------------------|------------------------------------------------------|----------------------------------------------|---------------------------------------------------------|-----------------------------------------------------|
|                                   |  | Perfluorobutane sulfonic acid (PFBS) | Perfluoropentane sulfonic acid (PFPeS) | Perfluorohexane sulfonic acid (PFHxS) | Perfluoroheptane sulfonic acid (PFHpS) | Perfluorooctane sulfonic acid (PFOS) | Perfluorodecane sulfonic acid (PFDS) | Perfluorobutanoic acid (PFBA)          | Perfluoropentanoic acid (PFPeA) | Perfluorohexanoic acid (PFHxA) | Perfluoroheptanoic acid (PFHpA) | Perfluorooctanoic acid (PFOA) | Perfluorononanoic acid (PFNA) | Perfluorodecanoic acid (PFDA) | Perfluoroundecanoic acid (PFUnDA) | Perfluorododecanoic acid (PFDoA) | Perfluorotridecanoic acid (PFTriDA)       | Perfluorotetradecanoic acid (PFTeDA) | 4:2 Fluorotelomer sulfonic acid (4:2 FTS) | 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | 10:2 Fluorotelomer sulfonic acid (10:2 FTS) | Perfluorooctane sulfonamide (FOSA) | N-Methyl perfluorooctane sulfonamide (MeFOSA) | N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOAA) | N-methyl perfluorooctane sulfonamidoethanol (MeFOSE) | N-Ethyl perfluorooctane sulfonamide (EtFOSA) | N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOAA) | N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE) |
|                                   |  | 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 - Limit of Reporting          |  | 0.02                                 | 0.02                                   | 0.01                                  | 0.02                                   |                                      | 0.02                                 | 0.1                                    | 0.02                            | 0.02                           | 0.02                            | 0.01                          | 0.02                          | 0.02                          | 0.02                              | 0.02                             | 0.02                                      | 0.05                                 | 0.05                                      | 0.05                                      | 0.05                                      | 0.05                                        | 0.02                               | 0.05                                          | 0.02                                                     | 0.05                                                 | 0.05                                         | 0.02                                                    | 0.05                                                |
| PFAS NEMP 2020 Interim Marine 99% |  |                                      |                                        |                                       |                                        | 0.00023*                             |                                      |                                        |                                 |                                |                                 | 19                            |                               |                               |                                   |                                  |                                           |                                      |                                           |                                           |                                           |                                             |                                    |                                               |                                                          |                                                      |                                              |                                                         |                                                     |
| PFAS NEMP 2020 Recreational Water |  |                                      |                                        |                                       |                                        |                                      |                                      |                                        |                                 |                                |                                 | 10                            |                               |                               |                                   |                                  |                                           |                                      |                                           |                                           |                                           |                                             |                                    |                                               |                                                          |                                                      |                                              |                                                         |                                                     |

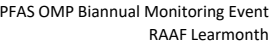
| Location Code | Date       | Field ID                | Lab Report Number | 0.20  | 0.20  | 1.58  | 0.05  | 0.88  | <0.02 | 0.1  | 0.15  | 0.54  | 0.04  | 0.07  | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 |
|---------------|------------|-------------------------|-------------------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| MW018         | 25/11/2021 | 0960_MW018_211125       | EP2114474         | 0.17  | 0.14  | 1.04  | <0.02 | 0.42  | <0.02 | <0.1 | 0.05  | 0.25  | 0.03  | 0.02  | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 |
| MW021         | 25/11/2021 | 0960_MW021_211125       | EP2114471         | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.01 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 |
| MW103         | 25/11/2021 | 0960_MW103_211125       | EP2114474         | 0.31  | 0.11  | 0.45  | <0.02 | 0.01  | <0.02 | <0.1 | 0.02  | 0.11  | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 |
| MW104         | 25/11/2021 | 0060_MW104_211125       | EP2114474         | 0.06  | <0.02 | 0.05  | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 |
| MW105         | 24/11/2021 | 0960_MW105_211124       | EP2114392         | 0.18  | 0.18  | 0.95  | <0.02 | 0.04  | <0.02 | <0.1 | 0.03  | 0.20  | <0.02 | 0.01  | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 |
| MW112         | 25/11/2021 | 0960_MW112_211125       | EP2114471         | 0.04  | 0.04  | 0.56  | <0.02 | 0.93  | <0.02 | <0.1 | <0.02 | 0.11  | <0.02 | 0.02  | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 |
| MW113         | 24/11/2021 | 0960_MW113_211124       | EP2114395         | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 |
| MW114         | 24/11/2021 | 0960_MW114_211124       | EP2114395         | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 |
| MW115         | 25/11/2021 | 0960_MW115_211125       | EP2114477         | 0.19  | 0.20  | 1.40  | 0.03  | 0.29  | <0.02 | <0.1 | 0.06  | 0.39  | 0.02  | 0.03  | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 |
| MW122         | 25/11/2021 | 0960_MW122_211125       | EP2114474         | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 |
| MW124         | 25/11/2021 | 0960_MW124_211125       | EP2114474         | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 |
| MW126         | 25/11/2021 | 0060_MW126_211125       | EP2114471         | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 |
| MW127         | 25/11/2021 | 0960_MW127_211125       | EP2114471         | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 |
| MW134         | 25/11/2021 | 0960_MW134_211125       | EP2114477         | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 |
| MW135         | 24/11/2021 | 0960_MW135_6.4-7_211124 | EP2114392         | 0.02  | <0.02 | 0.11  | <0.02 | 0.09  | <0.02 | <0.1 | 0.02  | 0.12  | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 |
| MW137         | 24/11/2021 | 0960_MW137_2.5-3_211124 | EP2114394         | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 |
| MW138         | 24/11/2021 | 0960_MW138_3-3.5_211124 | EP2114394         | <0.02 | <0.02 | <0.01 | <0.02 | 0.03  | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 |
| MW139         | 25/11/2021 | 0960_MW139_211125       | EP2114474         | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 |
| MW140         | 25/11/2021 | 0960_MW140_3.5-4_211125 | EP2114471         | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 |
| MW141         | 25/11/2021 | 0960_MW141_5-5.5_211125 | EP2114471         | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 |
| MW143         | 25/11/2021 | 0960_MW143_3-3.5_211125 | EP2114471         | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 |
| MW144         | 24/11/2021 | 0960_MW144_3-3.5_211124 | EP2114392         | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 |
| MW145         | 24/11/2021 | 0960_MW145_5-5.5_211124 | EP2114394         | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 |
| MW146         | 24/11/2021 | 0960_MW146_3-3.5_211124 | EP2114394         | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 |
| MW147         | 25/11/2021 | 0960_MW147_211125       | EP2114474         | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 |
| MW148D        | 24/11/2021 | 0960_MW148D_211124      | EP2114392         | 1.49  | 0.99  | 4.07  | 0.28  | 2.56  | <0.02 | 0.2  | 0.34  | 1.95  | 0.17  | 0.25  | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 |
| MW148S        | 24/11/2021 | 0960_MW148S_211124      | EP2114392         | 15.2  | 11.1  | 45.2  | 3.32  | 33.1  | <0.02 | 2.4  | 3.54  | 18.3  | 1.90  | 2.73  | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 |
| MW151         | 24/11/2021 | 0960_MW151_211124       | EP2114392         | 3.72  | 4.14  | 35.3  | 3.41  | 29.4  | <0.02 | 1.0  | 2.02  | 12.8  | 0.92  | 2.45  | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 |
| MW159         | 25/11/2021 | 0960_MW159_211125       | EP2114477         | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 |
| MW162         | 24/11/2021 | 0960_MW162_211124       | EP2114395         | 0.66  | 0.55  | 3.79  | 0.04  | 0.29  | <0.02 | 0.1  | 0.28  | 1.46  | 0.10  | 0.09  | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 |
| MW163         | 24/11/2021 | 0960_MW163_211124       | EP2114395</       |       |       |       |       |       |       |      |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |



Table B1 - Water samples Analytical Results

|                                   | PFAS                  |             | Inorganics                      |                                   |                                 |                             |              |               |          |               | Metals                                     |                    |                      |                      |                   |
|-----------------------------------|-----------------------|-------------|---------------------------------|-----------------------------------|---------------------------------|-----------------------------|--------------|---------------|----------|---------------|--------------------------------------------|--------------------|----------------------|----------------------|-------------------|
|                                   | Sum of PFHxS and PFOS | Sum of PFAS | Carbonate Alkalinity (as CaCO3) | Alkalinity (Bicarbonate as CaCO3) | Alkalinity (Hydroxide) as CaCO3 | Alkalinity (total) as CaCO3 | Anions Total | Cations Total | Chloride | Ionic Balance | Sulphate as SO4 - Turbidimetric (filtered) | Calcium (filtered) | Magnesium (filtered) | Potassium (filtered) | Sodium (filtered) |
|                                   | µg/L                  | µg/L        | mg/L                            | mg/L                              | mg/L                            | mg/L                        | meq/L        | meq/L         | mg/L     | %             | mg/L                                       | mg/L               | mg/L                 | mg/L                 | mg/L              |
| LOR - Limit of Reporting          | 0.01                  | 0.01        | 1                               | 1                                 | 1                               | 1                           | 0.01         | 0.01          | 1        | 0.01          | 1                                          | 1                  | 1                    | 1                    | 1                 |
| PFAS NEMP 2020 Interim Marine 99% |                       |             |                                 |                                   |                                 |                             |              |               |          |               |                                            |                    |                      |                      |                   |
| PFAS NEMP 2020 Recreational Water | 2                     |             |                                 |                                   |                                 |                             |              |               |          |               |                                            |                    |                      |                      |                   |

| Location Code | Date       | Field ID                  | Lab Report Number |       |       |    |     |    |     |       |       |        |      |       |       |       |       |
|---------------|------------|---------------------------|-------------------|-------|-------|----|-----|----|-----|-------|-------|--------|------|-------|-------|-------|-------|
| MW018         | 25/11/2021 | 0960_MW018_211125         | EP2114474         | 2.46  | 3.81  | <1 | 938 | <1 | 938 | 33.3  | 28.0  | 361    | 8.76 | 211   | 5     | 8     | 20    |
| MW021         | 24/11/2021 | 0960_MW021_211124         | EP2114395         | 1.46  | 2.12  | <1 | 999 | <1 | 999 | 41.1  | 34.2  | 659    | 9.16 | 121   | 4     |       | 753   |
| MW102         | 25/11/2021 | 0960_MW102_211125         | EP2114471         | <0.01 | <0.01 | <1 | 115 | <1 | 115 | 1,110 | 1,140 | 36,200 | 1.10 | 4,200 | 1,330 | 2,230 | 614   |
| MW103         | 25/11/2021 | 0960_MW103_211125         | EP2114474         | 0.46  | 1.01  | <1 | 156 | <1 | 156 | 857   | 973   | 28,300 | 6.36 | 2,660 | 1,410 | 2,130 | 728   |
| MW104         | 25/11/2021 | 0060_MW104_211125         | EP2114474         | 0.05  | 0.11  | <1 | 219 | <1 | 219 | 927   | 1,040 | 29,700 | 5.82 | 4,060 | 782   | 2,230 | 886   |
| MW105         | 24/11/2021 | 0960_MW105_211124         | EP2114392         | 0.99  | 1.59  | <1 | 358 | <1 | 358 | 441   | 508   | 14,300 | 7.03 | 1,470 | 604   | 1,190 | 427   |
| MW112         | 25/11/2021 | 0960_MW112_211125         | EP2114471         | 1.49  | 1.70  | <1 | 717 | <1 | 717 | 126   | 118   | 3,080  | 3.38 | 1,200 | 114   | 156   | 94    |
| MW113         | 24/11/2021 | 0960_MW113_211124         | EP2114395         | <0.01 | <0.01 | <1 | 386 | <1 | 386 | 100   | 101   | 3,070  | 0.61 | 272   | 210   | 178   | 66    |
| MW114         | 24/11/2021 | 0960_MW114_211124         | EP2114395         | <0.01 | <0.01 | <1 | 469 | <1 | 469 | 85.6  | 86.4  | 2,500  | 0.48 | 275   | 116   | 112   | 55    |
| MW115         | 25/11/2021 | 0960_MW115_211125         | EP2114477         | 1.69  | 2.61  | <1 | 339 | <1 | 339 | 374   | 376   | 11,900 | 0.23 | 1,520 | 544   | 780   | 255   |
| MW122         | 25/11/2021 | 0960_MW122_211125         | EP2114474         | <0.01 | <0.01 | <1 | 384 | <1 | 384 | 410   | 426   | 12,800 | 1.91 | 2,000 | 294   | 762   | 396   |
| MW124         | 25/11/2021 | 0960_MW124_211125         | EP2114474         | <0.01 | <0.01 | <1 | 153 | <1 | 153 | 984   | 1,130 | 31,400 | 6.93 | 4,600 | 926   | 2,320 | 946   |
| MW126         | 25/11/2021 | 0060_MW126_211125         | EP2114471         | <0.01 | <0.01 | <1 | 150 | <1 | 150 | 630   | 699   | 20,800 | 5.21 | 1,930 | 1,060 | 1,510 | 510   |
| MW127         | 25/11/2021 | 0960_MW127_211125         | EP2114471         | <0.01 | <0.01 | <1 | 145 | <1 | 145 | 775   | 870   | 25,500 | 5.81 | 2,520 | 1,060 | 1,740 | 511   |
| MW134         | 25/11/2021 | 0960_MW134_211125         | EP2114477         | <0.01 | <0.01 | <1 | 182 | <1 | 182 | 670   | 725   | 21,200 | 3.88 | 3,310 | 572   | 1,430 | 679   |
| MW135         | 24/11/2021 | 0960_MW135_6.4-7_211124   | EP2114392         | 0.20  | 0.36  | <1 | 247 | <1 | 247 | 350   | 363   | 11,100 | 1.76 | 1,550 | 376   | 828   | 315   |
| MW137         | 24/11/2021 | 0960_MW137_2.5-3_211124   | EP2114394         | <0.01 | <0.01 | <1 | 200 | <1 | 200 | 865   | 986   | 27,500 | 6.54 | 4,090 | 666   | 2,150 | 908   |
| MW138         | 24/11/2021 | 0960_MW138_3-3.5_211124   | EP2114394         | 0.03  | 0.03  | <1 | 165 | <1 | 165 | 926   | 1,130 | 29,400 | 9.81 | 4,510 | 974   | 2,270 | 890   |
| MW139         | 25/11/2021 | 0960_MW139_211125         | EP2114474         | <0.01 | <0.01 | <1 | 192 | <1 | 192 | 672   | 698   | 21,100 | 1.89 | 3,530 | 693   | 1,530 | 627   |
| MW140         | 25/11/2021 | 0960_MW140_3.5-4_211125   | EP2114471         | <0.01 | <0.01 | <1 | 198 | <1 | 198 | 1,240 | 1,260 | 39,900 | 0.52 | 5,520 | 806   | 2,710 | 1,120 |
| MW141         | 25/11/2021 | 0960_MW141_5-5.5_211125   | EP2114471         | <0.01 | <0.01 | <1 | 241 | <1 | 241 | 399   | 446   | 12,600 | 5.52 | 1,880 | 434   | 1,010 | 384   |
| MW143         | 25/11/2021 | 0960_MW143_3-3.5_211125   | EP2114471         | <0.01 | <0.01 | <1 | 148 | <1 | 148 | 1,000 | 1,190 | 31,900 | 8.35 | 4,870 | 1,040 | 2,510 | 936   |
| MW144         | 24/11/2021 | 0960_MW144_3-3.5_211124   | EP2114392         | <0.01 | <0.01 | <1 | 184 | <1 | 184 | 383   | 410   | 11,200 | 3.41 | 3,030 | 767   | 887   | 393   |
| MW145         | 24/11/2021 | 0960_MW145_5-5.5_211124   | EP2114394         | <0.01 | <0.01 | <1 | 123 | <1 | 123 | 1,140 | 1,310 | 36,400 | 7.00 | 5,390 | 1,080 | 2,780 | 1,180 |
| MW146         | 24/11/2021 | 0960_MW146_3-3.5_211124   | EP2114394         | <0.01 | <0.01 | <1 | 128 | <1 | 128 | 1,110 | 1,330 | 35,100 | 8.83 | 5,800 | 1,060 | 2,810 | 1,060 |
| MW147         | 25/11/2021 | 0960_MW147_211125         | EP2114474         | <0.01 | <0.01 | <1 | 159 | <1 | 159 | 1,220 | 1,400 | 38,700 | 7.14 | 5,810 | 1,090 | 2,930 | 1,110 |
| MW148D        | 24/11/2021 | 0960_MW148D_211124        | EP2114392         | 6.63  | 12.3  | <1 | 196 | <1 | 196 | 879   | 1,000 | 28,400 | 6.63 | 3,550 | 944   | 1,920 | 781   |
| MW148S        | 24/11/2021 | 0960_MW148S_211124        | EP2114392         | 78.3  | 137   | <1 | 385 | <1 | 385 | 475   | 537   | 15,100 | 6.13 | 2,000 | 596   | 1,070 | 384   |
| MW151         | 24/11/2021 | 0960_MW151_211124         | EP2114392         | 64.7  | 95.2  | <1 | 708 | <1 | 708 | 158   | 153   | 4,610  | 1.42 | 657   | 161   | 279   | 145   |
| MW159         | 25/11/2021 | 0960_MW159_211125         | EP2114477         | <0.01 | <0.01 | <1 | 482 | <1 | 482 | 314   | 304   | 9,910  | 1.62 | 1,180 | 416   | 607   | 233   |
| MW162         | 24/11/2021 | 0960_MW162_211124         | EP2114395         | 4.08  | 7.36  | <1 | 496 | <1 | 496 | 126   | 126   | 3,830  | 0.14 | 411   | 184   | 222   | 118   |
| MW163         | 24/11/2021 | 0960_MW163_211124         | EP2114395         | 10.3  | 15.7  | <1 | 439 | <1 | 439 | 121   | 119   | 3,570  | 1.04 | 574   | 156   | 188   | 101   |
| MW164         | 25/11/2021 | 0960_MW164_211125         | EP2114474         | 4.33  | 6.35  | <1 | 624 | <1 | 624 | 131   | 130   | 3,620  | 0.29 | 785   | 154   | 179   | 97    |
| MW165         | 24/11/2021 | 0960_MW165_211124         | EP2114395         | 0.01  | 0.01  | <1 | 867 | <1 | 867 | 29.3  | 24.5  | 384    | 8.82 | 54    | 2     | 4     | 19    |
| MW166         | 24/11/2021 | 0960_MW166_211124         | EP2114395         | 0.95  | 1.95  | <1 | 964 | <1 | 964 | 32.2  | 27.2  | 378    | 8.51 | 110   | 4     | 6     | 23    |
| MW167         | 24/11/2021 | 0960_MW167_211124         | EP2114395         | 2.58  | 3.59  | <1 | 889 | <1 | 889 | 53.8  | 49.9  | 1,050  | 3.70 | 306   | 20    | 27    | 40    |
| MW168         | 24/11/2021 | 0960_MW168_211124         | EP2114395         | 1.34  | 2.22  | <1 | 579 | <1 | 579 | 128   | 128   | 3,620  | 0.28 | 703   | 179   | 201   | 98    |
| MW170         | 25/11/2021 | 0960_MW170_211125         | EP2114477         | 0.52  | 0.74  | <1 | 208 | <1 | 208 | 459   | 460   | 15,000 | 0.12 | 1,510 | 684   | 891   | 173   |
| MW172         | 25/11/2021 | 0960_MW172_211125         | EP2114477         | 7.60  | 13.6  | <1 | 287 | <1 | 287 | 398   | 394   | 12,000 | 0.56 | 2,610 | 468   | 646   | 206   |
| MW175         | 24/11/2021 | 0960_MW175_5.5-6.0_211124 | EP2114392         | <0.01 | <0.01 | <1 | 429 | <1 | 429 | 43.0  | 40.0  | 1,140  | 3.60 | 108   | 70    | 180   | 35    |
| MW176         | 24/11/2021 | 0960_MW176_6-6.5_211124   | EP2114392         | 0.01  | 0.26  | <1 | 140 | <1 | 140 | 740   | 811   | 23,600 | 4.55 | 3,460 | 691   | 1,740 | 787   |
| MW177         | 24/11/2021 | 0960_MW177_3.5-4_211124   | EP2114392         | 0.01  | 0.18  | <1 | 136 | <1 | 136 | 1,080 | 1,220 | 34,600 | 6.22 | 4,900 | 838   | 2,640 | 995   |
| MW178         | 24/11/2021 | 0960_MW178_9-9.5_211124   | EP2114392         | <0.01 | 0.33  | <1 | 128 | <1 | 128 | 1,050 | 1,240 | 33,500 | 8.04 | 5,080 | 1,140 | 2,620 | 996   |
| MW179         | 24/11/2021 | 0960_MW179_3.2-3.7_211124 | EP2114394         | <0.01 | <0.01 | <1 | 176 | <1 | 176 | 877   | 1,020 | 28,000 | 7.75 | 4,000 | 662   | 2,240 | 922   |
| MW180         | 24/11/2021 | 0960_MW180_3.5-4_211124   | EP2114394         | <0.01 | <0.01 | <1 | 219 | <1 | 219 | 994   | 1,190 | 31,600 | 9.06 | 4,730 | 784   | 2,560 | 967   |
| MW181         | 25/11/2021 | 0960_MW181_3.5-4_211125   | EP2114471         | <0.01 | <0.01 | <1 | 204 | <1 | 204 | 1,330 | 1,360 | 42,500 | 1.00 | 6,310 | 1,040 | 2,960 | 1,190 |
| MW211         | 25/11/2021 | 0960_MW211_211125         | EP2114474         | 4.13  | 5.14  | 32 | 730 | <1 | 763 | 21.5  | 19.2  | 158    | 5.60 | 86    | 2     | 4     | 15    |
| MW233         | 24/11/2021 | 0960_MW233_211124         | EP2114395         | 4.19  | 5.14  | 10 | 585 | <1 | 595 | 18.4  | 15.2  | 207    | 9.61 | 32    | 3     | 2     | 11    |
| MW238         | 24/11/2021 | 0960_MW012_211124         | EP2114392         | 87.7  | 185   | <1 | 763 | <1 | 763 | 71.3  | 62.2  | 1,370  | 6.84 | 837   | 20    | 43    | 60    |
| OTH103        | 24/11/2021 | 0960_OTH103_211124        | EP2114392         | <0.01 | <0.01 | 4  | 121 | <1 | 125 | 589   | 656   | 18,900 | 5.41 | 2,560 | 468   | 1,480 | 596   |
| OTH106        | 25/11/2021 | 0960_OTH106_211125        | EP2114471         | <0.01 | <0.01 | <1 | 117 | <1 | 117 | 599   | 694   | 19,200 | 7.35 | 2,640 | 470   | 1,560 | 615   |
| OTH107        | 25/11/2021 | 0960_OTH107_211125        | EP2114471         | <0.01 | <0.01 | <1 | 120 | <1 | 120 | 605   | 666   | 19,400 | 4.80 | 2,650 | 456   | 1,500 | 588   |
| OTH129        | 24/11/2021 | 0960_OTH129_211124        | EP2114392         | <0.01 | <0.01 | <1 | 124 | <1 | 124 | 621   | 689   | 19,900 | 5.18 | 2,740 | 485   | 1,540 | 620   |
| OTH132        | 24/11/2021 | 0060_OTH132_211124        | EP2114392         | <0.01 | <0.01 | <1 | 134 | <1 | 134 | 610   | 672   | 19,600 | 4.85 | 2,630 | 479   | 1,510 | 606   |
| OTH134        | 24/11/2021 | 0960_OTH134_211124        | EP2114392         | <0.01 | <0.01 | <1 | 193 | <1 | 193 | 638   | 662   | 20,400 | 1.79 | 2,840 | 492   | 1,480 | 594   |
| SW001         | 24/11/2021 | 0960_SW001_211124         | EP2114398         | <0.01 | <0.01 | <1 | 188 | <1 | 188 | 853   | 999   | 27,200 | 7.91 | 3,930 | 676   | 2,200 | 917   |
| SW205         | 25/11/2021 | 0960_SW205_211125         | EP2114473         | <0.01 | <0.01 | <1 |     |    |     |       |       |        |      |       |       |       |       |
| SW207         | 24/11/2021 | 0960_SW207_211124         | EP2114399         | <0.01 | <0.01 | <1 | 170 | <1 | 170 | 671   | 757   | 21,400 | 6.02 | 3,060 | 542   | 1,680 | 672   |
| SW208         | 25/11/2021 | 0960_SW208_211125         | EP2114473         | <0.01 | <0.01 | <1 | 138 | <1 | 138 | 607   | 704   | 19,400 | 7.45 | 2,720 | 487   | 1,570 | 618   |
| SW209         | 24/11/2021 | 0960_SW209_211124         | EP21>             |       |       |    |     |    |     |       |       |        |      |       |       |       |       |

[illegible]

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





Table B2: Sediment Analytical Results

|                                               | PFAS - Perfluoroalkyl Sulfonamides                     |                                                                    |                                                               |                                                    |                                                                   |                                                              | PFAS                     |                              |             |
|-----------------------------------------------|--------------------------------------------------------|--------------------------------------------------------------------|---------------------------------------------------------------|----------------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------------|--------------------------|------------------------------|-------------|
|                                               | N-Methyl<br>perfluorooctane<br>sulfonamide<br>(MeFOSA) | N-Methyl<br>perfluorooctane<br>sulfonamidoacetic<br>acid (MeFOSAA) | N-methyl<br>perfluorooctane<br>sulfonamidoethanol<br>(MeFOSE) | N-Ethyl<br>perfluorooctane<br>sulfonamide (EtFOSA) | N-Ethyl<br>perfluorooctane<br>sulfonamidoacetic<br>acid (EtFOSAA) | N-Ethyl<br>perfluorooctane<br>sulfonamidoethanol<br>(EtFOSE) | Sum of PFHxS and<br>PFOS | Sum of PFAS (WA DER<br>List) | Sum of PFAS |
|                                               | mg/kg                                                  | mg/kg                                                              | mg/kg                                                         | mg/kg                                              | mg/kg                                                             | mg/kg                                                        | mg/kg                    | mg/kg                        | mg/kg       |
| EQL                                           | 0.0005                                                 | 0.0002                                                             | 0.0005                                                        | 0.0005                                             | 0.0002                                                            | 0.0005                                                       | 0.0002                   | 0.0002                       | 0.0002      |
| PFAS NEMP 2020 Ecological direct exposure     |                                                        |                                                                    |                                                               |                                                    |                                                                   |                                                              |                          |                              |             |
| PFAS NEMP 2020 Ecological indirect exposure   |                                                        |                                                                    |                                                               |                                                    |                                                                   |                                                              |                          |                              |             |
| PFAS NEMP 2020 Industrial/ commercial (HIL D) |                                                        |                                                                    |                                                               |                                                    |                                                                   |                                                              | 20                       |                              |             |

| Site ID | Location | Cr Date    | Field ID          | Lab Report Numl |         |         |         |         |         |         |         |         |         |
|---------|----------|------------|-------------------|-----------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0960    | SD199    | 25/11/2021 | 0960_SD199_211125 | EP2114475       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.0003  | 0.0003  | 0.0003  |
| 0960    | SD205    | 25/11/2021 | 0960_SD205_211125 | EP2114472       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | <0.0002 | <0.0002 | <0.0002 |
| 0960    | SD207    | 24/11/2021 | 0960_SD207_211124 | EP2114396       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | <0.0002 | <0.0002 | <0.0002 |
| 0960    | SD208    | 25/11/2021 | 0960_SD208_211125 | EP2114472       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | <0.0002 | <0.0002 | <0.0002 |
| 0960    | SD209    | 24/11/2021 | 0060_SD209_211124 | EP2114396       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | <0.0002 | <0.0002 | <0.0002 |
| 0960    | SD210    | 24/11/2021 | 0960_SD210_211124 | EP2114396       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.0008  | 0.0008  | 0.0008  |
| 0960    | SD211    | 24/11/2021 | 0960_SD211_211124 | EP2114393       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.0007  | 0.0007  | 0.0007  |
| 0960    | SD219    | 25/11/2021 | 0960_SD219_211125 | EP2114475       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.0009  | 0.0009  | 0.0009  |
| 0960    | SD300    | 24/11/2021 | 0960_SD300_211124 | EP2114393       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.0004  | 0.0004  | 0.0004  |
| 0960    | SD301    | 24/11/2021 | 0960_SD301_211124 | EP2114393       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.0002  | 0.0002  | 0.0002  |
| 0960    | SD302    | 24/11/2021 | 0960_SD302_211124 | EP2114396       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | <0.0002 | <0.0002 | <0.0002 |
| 0960    | SD303    | 24/11/2021 | 0960_SD303_211124 | EP2114396       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.0003  | 0.0003  | 0.0003  |
| 0960    | SD304    | 24/11/2021 | 0960_SD304_211124 | EP2114393       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | <0.0002 | <0.0002 | <0.0002 |
| 0960    | SD305    | 24/11/2021 | 0060_SD305_211124 | EP2114393       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | <0.0002 | <0.0002 | <0.0002 |
| 0960    | SS108    | 25/11/2021 | 0960_SS108_211125 | EP2114475       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.0042  | 0.0042  | 0.0049  |
| 0960    | SS113    | 25/11/2021 | 0960_SS113_211125 | EP2114475       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.0064  | 0.0064  | 0.0070  |
| 0960    | SS114    | 24/11/2021 | 0960_QC117_211124 | EP2114393       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.0050  | 0.0050  | 0.0056  |
| 0960    | SS114    | 24/11/2021 | 0960_SS114_211124 | EP2114393       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.0053  | 0.0053  | 0.0060  |
| 0960    | SS121    | 24/11/2021 | 0960_SS121_211124 | EP2114397       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.0275  | 0.0275  | 0.0323  |
| 0960    | SS122    | 24/11/2021 | 0960_SS122_211124 | EP2114397       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.0154  | 0.0154  | 0.0156  |
| 0960    | SS123    | 24/11/2021 | 0960_QC122_211124 | EP2114397       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.0352  | 0.0352  | 0.0362  |
| 0960    | SS123    | 24/11/2021 | 0960_SS123_211124 | EP2114397       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.0326  | 0.0326  | 0.0338  |
| 0960    | SS124    | 25/11/2021 | 0960_SS124_211125 | EP2114476       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.241   | 0.242   | 0.262   |
| 0960    | SS125    | 25/11/2021 | 0960_SS125_211125 | EP2114476       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.0020  | 0.0020  | 0.0020  |
| 0960    | SS157    | 25/11/2021 | 0960_SS157_211125 | EP2114476       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.0011  | 0.0011  | 0.0011  |
| 0960    | SS166    | 25/11/2021 | 0960_SS166_211125 | EP2114476       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.0006  | 0.0006  | 0.0006  |
| 0960    | SS168    | 25/11/2021 | 0960_SS168_211125 | EP2114476       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.0004  | 0.0004  | 0.0004  |
| 0960    | SS170    | 25/11/2021 | 0060_SS170_211125 | EP2114475       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.0055  | 0.0055  | 0.0058  |
| 0960    | SS174    | 25/11/2021 | 0960_SS174_211125 | EP2114476       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.245   | 0.245   | 0.249   |
| 0960    | SS176    | 25/11/2021 | 0960_SS176_211125 | EP2114476       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.0036  | 0.0036  | 0.0036  |
| 0960    | SS189    | 25/11/2021 | 0960_SS189_211125 | EP2114476       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.0102  | 0.0102  | 0.0105  |
| 0960    | SS190    | 24/11/2021 | 0960_QC119_211124 | EP2114393       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.0146  | 0.0146  | 0.0152  |
| 0960    | SS190    | 24/11/2021 | 0960_SS190_211124 | EP2114393       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.0113  | 0.0113  | 0.0113  |
| 0960    | SS192    | 24/11/2021 | 0960_SS192_211124 | EP2114393       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | <0.0002 | <0.0002 | <0.0002 |
| 0960    | SS193    | 24/11/2021 | 0960_SS193_211124 | EP2114393       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.0002  | 0.0002  | 0.0002  |
| 0960    | SS198    | 24/11/2021 | 0960_QC125_211124 | EP2114396       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.0029  | 0.0029  | 0.0029  |
| 0960    | SS198    | 24/11/2021 | 0960_SS198_211124 | EP2114396       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.0035  | 0.0035  | 0.0035  |
| 0960    | SS227    | 24/11/2021 | 0960_QC121_211124 | EP2114396       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.0199  | 0.0199  | 0.0199  |
| 0960    | SS227    | 24/11/2021 | 0960_SS227_211124 | EP2114396       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.0238  | 0.0238  | 0.0238  |
| 0960    | SS231    | 25/11/2021 | 0960_SS231_211125 | EP2114475       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.0341  | 0.0341  | 0.0343  |
| 0960    | SS234    | 24/11/2021 | 0960_SS234_211124 | EP2114393       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.0453  | 0.0473  | 0.0491  |
| 0960    | SS235    | 25/11/2021 | 0960_SS235_211125 | EP2114475       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.0159  | 0.0159  | 0.0159  |
| 0960    | SS243    | 25/11/2021 | 0960_SS243_211125 | EP2114476       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.0075  | 0.0075  | 0.0075  |
| 0960    | SS265    | 25/11/2021 | 0960_SS265_211125 | EP2114475       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.0165  | 0.0165  | 0.0173  |
| 0960    | SS277    | 25/11/2021 | 0960_SS277_211125 | EP2114476       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.0703  | 0.0703  | 0.0714  |
| 0960    | SS278    | 25/11/2021 | 0960_SS278_211125 | EP2114476       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.0030  | 0.0030  | 0.0034  |
| 0960    | SS279    | 25/11/2021 | 0960_SS279_211125 | EP2114476       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.0038  | 0.0038  | 0.0038  |
| 0960    | SS288    | 24/11/2021 | 0960_SS288_211124 | EP2114393       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.0007  | 0.0007  | 0.0007  |
| 0960    | SS291    | 24/11/2021 | 0960_SS291_211124 | EP2114396       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.0022  | 0.0022  | 0.0022  |
| 0960    | SS292    | 24/11/2021 | 0960_SS292_211124 | EP2114396       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.0020  | 0.0020  | 0.0020  |
| 0960    | SS293    | 24/11/2021 | 0960_SS293_211124 | EP2114396       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | 0.0017  | 0.0017  | 0.0017  |
| 0960    | SS298    | 25/11/2021 | 0960_SS298_211125 | EP2114472       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | <0.0002 | <0.0002 | <0.0002 |
| 0960    | SS301    | 25/11/2021 | 0960_SS301_211125 | EP2114472       | <0.0005 | <0.0002 | <0.0005 | <0.0005 | <0.0002 | <0.0005 | <0.0002 | <0.0002 | <0.0002 |

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

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



Table B3: Rinstates and Field Blanks Analytical Results

|                                   | PFAS - Perfluoroalkyl Sulfonic Acids |                                        |                                       |                                        |                                      |                                      | PFAS - Perfluoroalkyl Carboxylic Acids |                                 |                                 |                                 |                               |                               |                               |                                   |                                   |                                    |
|-----------------------------------|--------------------------------------|----------------------------------------|---------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|----------------------------------------|---------------------------------|---------------------------------|---------------------------------|-------------------------------|-------------------------------|-------------------------------|-----------------------------------|-----------------------------------|------------------------------------|
|                                   | Perfluorobutane sulfonic acid (PFBS) | Perfluoropentane sulfonic acid (PFPeS) | Perfluorohexane sulfonic acid (PFHxS) | Perfluoroheptane sulfonic acid (PFHpS) | Perfluorooctane sulfonic acid (PFOS) | Perfluorodecane sulfonic acid (PFDS) | Perfluorobutanoic acid (PFBA)          | Perfluoropentanoic acid (PFPeA) | Perfluoroheptanoic acid (PFHpA) | Perfluoroheptanoic acid (PFHpA) | Perfluorooctanoic acid (PFOA) | Perfluorononanoic acid (PFNA) | Perfluorodecanoic acid (PFDA) | Perfluoroundecanoic acid (PFUnDA) | Perfluorododecanoic acid (PFDoDA) | Perfluorotridecanoic acid (PFTrDA) |
|                                   | µg/L                                 | µg/L                                   | µg/L                                  | µg/L                                   | µg/L                                 | µg/L                                 | µg/L                                   | µg/L                            | µg/L                            | µg/L                            | µg/L                          | µg/L                          | µg/L                          | µg/L                              | µg/L                              | µg/L                               |
| LOR - Limit of Reporting          | 0.02                                 | 0.02                                   | 0.01                                  | 0.02                                   | 0.01                                 | 0.02                                 | 0.1                                    | 0.02                            | 0.02                            | 0.02                            | 0.01                          | 0.02                          | 0.02                          | 0.02                              | 0.02                              | 0.02                               |
| PFAS NEMP 2020 Drinking Water     |                                      |                                        |                                       |                                        |                                      |                                      |                                        |                                 |                                 |                                 | 0.56                          |                               |                               |                                   |                                   |                                    |
| PFAS NEMP 2020 Interim Marine 99% |                                      |                                        |                                       |                                        | 0.00023                              |                                      |                                        |                                 |                                 |                                 | 19                            |                               |                               |                                   |                                   |                                    |
| PFAS NEMP 2020 Recreational Water |                                      |                                        |                                       |                                        |                                      |                                      |                                        |                                 |                                 |                                 | 10                            |                               |                               |                                   |                                   |                                    |

| Date       | Field ID          | Sample Type | Lab Report Number |       |       |       |       |       |       |      |       |       |       |       |       |       |       |       |       |
|------------|-------------------|-------------|-------------------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 24/11/2021 | 0960_QC301_211124 | Rinsate     | EP2114392         | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| 24/11/2021 | 0960_QC302_211124 | Rinsate     | EP2114392         | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| 24/11/2021 | 0960_QC303_211124 | Rinsate     | EP2114392         | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| 24/11/2021 | 0960_QC401_211124 | Blank       | EP2114392         | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| 24/11/2021 | 0960_QC402_211124 | Blank       | EP2114392         | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| 24/11/2021 | 0960_QC403_211124 | Blank       | EP2114392         | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| 25/11/2021 | 0960_QC301_211125 | Rinsate     | EP2114471         | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| 25/11/2021 | 0960_QC302_211125 | Rinsate     | EP2114471         | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| 25/11/2021 | 0960_QC303_211125 | Rinsate     | EP2114471         | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| 25/11/2021 | 0960_QC401_211125 | Blank       | EP2114471         | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| 25/11/2021 | 0960_QC402_211125 | Blank       | EP2114471         | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| 25/11/2021 | 0960_QC403_211125 | Blank       | EP2114471         | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |

Environmental Standards

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



Table B3: Rinstates and Field Blanks Analytical Results

|                                   | Perfluorobutane sulfonic acid (PFBS)      | Perfluorotetradecanoic acid (PFTeDA)      | PFAS - (n:2) Fluorotelomer Sulfonic Acids |                                             |                                    |                                               | PFAS - Perfluoroalkyl Sulfonamides                        |                                                      |                                              |                                                          |                                                     |                       |                           | PFAS        |      |      |
|-----------------------------------|-------------------------------------------|-------------------------------------------|-------------------------------------------|---------------------------------------------|------------------------------------|-----------------------------------------------|-----------------------------------------------------------|------------------------------------------------------|----------------------------------------------|----------------------------------------------------------|-----------------------------------------------------|-----------------------|---------------------------|-------------|------|------|
|                                   | 4:2 Fluorotelomer sulfonic acid (4:2 FTS) | 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | 10:2 Fluorotelomer sulfonic acid (10:2 FTS) | Perfluorooctane sulfonamide (FOSA) | N-Methyl perfluorooctane sulfonamide (MeFOSA) | N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | N-methyl perfluorooctane sulfonamidoethanol (MeFOSE) | N-Ethyl perfluorooctane sulfonamide (EtFOSA) | N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA) | N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE) | Sum of PFHxS and PFOS | Sum of PFAS (WA DER List) | Sum of PFAS |      |      |
|                                   | µg/L                                      | µg/L                                      | µg/L                                      | µg/L                                        | µg/L                               | µg/L                                          | µg/L                                                      | µg/L                                                 | µg/L                                         | µg/L                                                     | µg/L                                                | µg/L                  | µg/L                      | µg/L        | µg/L | µg/L |
| LOR - Limit of Reporting          | 0.02                                      | 0.05                                      | 0.05                                      | 0.05                                        | 0.05                               | 0.05                                          | 0.02                                                      | 0.05                                                 | 0.02                                         | 0.05                                                     | 0.05                                                | 0.02                  | 0.05                      | 0.01        | 0.01 | 0.01 |
| PFAS NEMP 2020 Drinking Water     |                                           |                                           |                                           |                                             |                                    |                                               |                                                           |                                                      |                                              |                                                          |                                                     |                       |                           | 0.07        |      |      |
| PFAS NEMP 2020 Interim Marine 99% |                                           |                                           |                                           |                                             |                                    |                                               |                                                           |                                                      |                                              |                                                          |                                                     |                       |                           |             |      |      |
| PFAS NEMP 2020 Recreational Water |                                           |                                           |                                           |                                             |                                    |                                               |                                                           |                                                      |                                              |                                                          |                                                     |                       |                           | 2           |      |      |

| Date       | Field ID          | Sample Type | Lab Report Number |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|------------|-------------------|-------------|-------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 24/11/2021 | 0960_QC301_211124 | Rinsate     | EP2114392         | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 | <0.01 | <0.01 | <0.01 |
| 24/11/2021 | 0960_QC302_211124 | Rinsate     | EP2114392         | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 | <0.01 | <0.01 | <0.01 |
| 24/11/2021 | 0960_QC303_211124 | Rinsate     | EP2114392         | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 | <0.01 | <0.01 | <0.01 |
| 24/11/2021 | 0960_QC401_211124 | Blank       | EP2114392         | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 | <0.01 | <0.01 | <0.01 |
| 24/11/2021 | 0960_QC402_211124 | Blank       | EP2114392         | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 | <0.01 | <0.01 | <0.01 |
| 24/11/2021 | 0960_QC403_211124 | Blank       | EP2114392         | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 | <0.01 | <0.01 | <0.01 |
| 25/11/2021 | 0960_QC301_211125 | Rinsate     | EP2114471         | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 | <0.01 | <0.01 | <0.01 |
| 25/11/2021 | 0960_QC302_211125 | Rinsate     | EP2114471         | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 | <0.01 | <0.01 | <0.01 |
| 25/11/2021 | 0960_QC303_211125 | Rinsate     | EP2114471         | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 | <0.01 | <0.01 | <0.01 |
| 25/11/2021 | 0960_QC401_211125 | Blank       | EP2114471         | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 | <0.01 | <0.01 | <0.01 |
| 25/11/2021 | 0960_QC402_211125 | Blank       | EP2114471         | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 | <0.01 | <0.01 | <0.01 |
| 25/11/2021 | 0960_QC403_211125 | Blank       | EP2114471         | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 | <0.01 | <0.01 | <0.01 |

Environmental Standards

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



| Lab Report Number                                         |      |      | Date              | 24/11/2021        | 24/11/2021        |       |        |    | 24/11/2021        | 24/11/2021        |    |       |       | 24/11/2021        | 24/11/2021        |  |  |  |                   |                   |                   |                   |                   |
|-----------------------------------------------------------|------|------|-------------------|-------------------|-------------------|-------|--------|----|-------------------|-------------------|----|-------|-------|-------------------|-------------------|--|--|--|-------------------|-------------------|-------------------|-------------------|-------------------|
|                                                           |      |      | Field ID          | 0960_MW012_211124 | 0960_QC115_211124 |       |        |    | Field ID          | 0960_MW012_211124 |    |       |       | 0960_QC215_211124 | Field ID          |  |  |  | 0960_MW105_211124 | 0960_QC116_211124 | Field ID          | 0960_MW105_211124 | 0960_QC216_211124 |
|                                                           |      |      | Matrix Type       | Water             | Water             |       |        |    | Matrix Type       | Water             |    |       |       | Water             | Matrix Type       |  |  |  | Water             | Water             | Matrix Type       | Water             | Water             |
|                                                           |      |      | Lab Report Number | EP2114392         | EP2114392         |       |        |    | Lab Report Number | EP2114392         |    |       |       | 845088            | Lab Report Number |  |  |  | EP2114392         | 845088            | Lab Report Number | EP2114392         | 845088            |
|                                                           | Unit | EQL  |                   |                   |                   |       |        |    |                   |                   |    |       |       |                   |                   |  |  |  |                   |                   |                   |                   |                   |
| PFAS - Perfluoroalkyl Sulfonic Acids                      |      |      |                   |                   |                   |       |        |    |                   |                   |    |       |       |                   |                   |  |  |  |                   |                   |                   |                   |                   |
| Perfluoropropanesulfonic acid (PFPrS)                     | µg/L | 0.01 |                   |                   |                   |       | 2.2    |    |                   |                   |    |       |       |                   | 0.05              |  |  |  |                   |                   |                   |                   |                   |
| Perfluorobutane sulfonic acid (PFBS)                      | µg/L | 0.01 | 8.41              | 8.71              | 4                 | 8.41  | 5.1    | 49 | 0.18              | 0.29              | 47 | 0.18  | 0.12  | 40                |                   |  |  |  |                   |                   |                   |                   |                   |
| Perfluoropentane sulfonic acid (PFPeS)                    | µg/L | 0.01 | 6.92              | 6.95              | 0                 | 6.92  | 5.4    | 25 | 0.18              | 0.31              | 53 | 0.18  | 0.19  | 5                 |                   |  |  |  |                   |                   |                   |                   |                   |
| Perfluorohexane sulfonic acid (PFHxS)                     | µg/L | 0.01 | 44.8              | 49.3              | 10                | 44.8  | 35     | 25 | 0.95              | 1.70              | 57 | 0.95  | 0.79  | 18                |                   |  |  |  |                   |                   |                   |                   |                   |
| Perfluoroheptane sulfonic acid (PFHpS)                    | µg/L | 0.01 | 4.24              | 4.35              | 3                 | 4.24  | 5.2    | 20 | <0.02             | <0.02             | 0  | <0.02 | 0.01  | 0                 |                   |  |  |  |                   |                   |                   |                   |                   |
| Perfluorooctane sulfonic acid (PFOS)                      | µg/L | 0.01 | 42.9              | 52.8              | 21                | 42.9  | 53     | 21 | 0.04              | 0.06              | 40 | 0.04  | 0.03  | 29                |                   |  |  |  |                   |                   |                   |                   |                   |
| Perfluorononanesulfonic acid (PFNS)                       | µg/L | 0.01 |                   |                   |                   |       | 0.08   |    |                   |                   |    |       | <0.01 |                   |                   |  |  |  |                   |                   |                   |                   |                   |
| Perfluorodecane sulfonic acid (PFDS)                      | µg/L | 0.01 | <0.02             | <0.02             | 0                 | <0.02 | <0.01  | 0  | <0.02             | <0.02             | 0  | <0.02 | <0.01 | 0                 |                   |  |  |  |                   |                   |                   |                   |                   |
| PFAS - Perfluoroalkyl Carboxylic Acids                    |      |      |                   |                   |                   |       |        |    |                   |                   |    |       |       |                   |                   |  |  |  |                   |                   |                   |                   |                   |
| Perfluorobutanoic acid (PFBA)                             | µg/L | 0.05 | 4.7               | 4.8               | 2                 | 4.7   | 4.1    | 14 | <0.1              | <0.1              | 0  | <0.1  | <0.05 | 0                 |                   |  |  |  |                   |                   |                   |                   |                   |
| Perfluoropentanoic acid (PFPeA)                           | µg/L | 0.01 | 13.0              | 13.1              | 1                 | 13.0  | 10     | 26 | 0.03              | 0.05              | 50 | 0.03  | 0.03  | 3                 |                   |  |  |  |                   |                   |                   |                   |                   |
| Perfluorohexanoic acid (PFHxA)                            | µg/L | 0.01 | 51.6              | 56.7              | 9                 | 51.6  | 21     | 84 | 0.20              | 0.33              | 49 | 0.20  | 0.14  | 35                |                   |  |  |  |                   |                   |                   |                   |                   |
| Perfluoroheptanoic acid (PFHpA)                           | µg/L | 0.01 | 3.88              | 4.03              | 4                 | 3.88  | 2.9    | 29 | <0.02             | <0.02             | 0  | <0.02 | 0.01  | 0                 |                   |  |  |  |                   |                   |                   |                   |                   |
| Perfluorooctanoic acid (PFOA)                             | µg/L | 0.01 | 4.42              | 4.65              | 5                 | 4.42  | 4.0    | 10 | 0.01              | 0.02              | 67 | 0.01  | 0.01  | 0                 |                   |  |  |  |                   |                   |                   |                   |                   |
| Perfluorononanoic acid (PFNA)                             | µg/L | 0.01 | 0.04              | 0.04              | 0                 | 0.04  | 0.03   | 29 | <0.02             | <0.02             | 0  | <0.02 | <0.01 | 0                 |                   |  |  |  |                   |                   |                   |                   |                   |
| Perfluorodecanoic acid (PFDA)                             | µg/L | 0.01 | <0.02             | <0.02             | 0                 | <0.02 | <0.01  | 0  | <0.02             | <0.02             | 0  | <0.02 | <0.01 | 0                 |                   |  |  |  |                   |                   |                   |                   |                   |
| Perfluoroundecanoic acid (PFUnDA)                         | µg/L | 0.01 | <0.02             | <0.02             | 0                 | <0.02 | <0.01  | 0  | <0.02             | <0.02             | 0  | <0.02 | <0.01 | 0                 |                   |  |  |  |                   |                   |                   |                   |                   |
| Perfluorododecanoic acid (PFDoDA)                         | µg/L | 0.01 | <0.02             | <0.02             | 0                 | <0.02 | <0.01  | 0  | <0.02             | <0.02             | 0  | <0.02 | <0.01 | 0                 |                   |  |  |  |                   |                   |                   |                   |                   |
| Perfluorotridecanoic acid (PFTrDA)                        | µg/L | 0.01 | <0.02             | <0.02             | 0                 | <0.02 | <0.01  | 0  | <0.02             | <0.02             | 0  | <0.02 | <0.01 | 0                 |                   |  |  |  |                   |                   |                   |                   |                   |
| Perfluorotetradecanoic acid (PFTeDA)                      | µg/L | 0.01 | <0.05             | <0.05             | 0                 | <0.05 | <0.01  | 0  | <0.05             | <0.05             | 0  | <0.05 | <0.01 | 0                 |                   |  |  |  |                   |                   |                   |                   |                   |
| PFAS - (n:2) Fluorotelomer Sulfonic Acids                 |      |      |                   |                   |                   |       |        |    |                   |                   |    |       |       |                   |                   |  |  |  |                   |                   |                   |                   |                   |
| 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | µg/L | 0.01 | <0.05             | <0.05             | 0                 | <0.05 | <0.01  | 0  | <0.05             | <0.05             | 0  | <0.05 | <0.01 | 0                 |                   |  |  |  |                   |                   |                   |                   |                   |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | µg/L | 0.05 | 0.18              | 0.18              | 0                 | 0.18  | 0.10   | 57 | <0.05             | <0.05             | 0  | <0.05 | <0.05 | 0                 |                   |  |  |  |                   |                   |                   |                   |                   |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | µg/L | 0.01 | 0.08              | 0.09              | 12                | 0.08  | 0.05   | 46 | <0.05             | <0.05             | 0  | <0.05 | <0.01 | 0                 |                   |  |  |  |                   |                   |                   |                   |                   |
| 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | µg/L | 0.01 | <0.05             | <0.05             | 0                 | <0.05 | <0.01  | 0  | <0.05             | <0.05             | 0  | <0.05 | <0.01 | 0                 |                   |  |  |  |                   |                   |                   |                   |                   |
| PFAS - Perfluoroalkyl Sulfonamides                        |      |      |                   |                   |                   |       |        |    |                   |                   |    |       |       |                   |                   |  |  |  |                   |                   |                   |                   |                   |
| Perfluorooctane sulfonamide (FOSA)                        | µg/L | 0.02 | 0.06              | 0.07              | 15                | 0.06  | 0.06   | 0  | <0.02             | <0.02             | 0  | <0.02 | <0.05 | 0                 |                   |  |  |  |                   |                   |                   |                   |                   |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)             | µg/L | 0.05 | <0.05             | <0.05             | 0                 | <0.05 | <0.05  | 0  | <0.05             | <0.05             | 0  | <0.05 | <0.05 | 0                 |                   |  |  |  |                   |                   |                   |                   |                   |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | µg/L | 0.02 | <0.02             | <0.02             | 0                 | <0.02 | <0.05  | 0  | <0.02             | <0.02             | 0  | <0.02 | <0.05 | 0                 |                   |  |  |  |                   |                   |                   |                   |                   |
| N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | µg/L | 0.05 | <0.05             | <0.05             | 0                 | <0.05 | <0.05  | 0  | <0.05             | <0.05             | 0  | <0.05 | <0.05 | 0                 |                   |  |  |  |                   |                   |                   |                   |                   |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | µg/L | 0.05 | <0.05             | <0.05             | 0                 | <0.05 | <0.05  | 0  | <0.05             | <0.05             | 0  | <0.05 | <0.05 | 0                 |                   |  |  |  |                   |                   |                   |                   |                   |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | µg/L | 0.02 | <0.02             | <0.02             | 0                 | <0.02 | <0.05  | 0  | <0.02             | <0.02             | 0  | <0.02 | <0.05 | 0                 |                   |  |  |  |                   |                   |                   |                   |                   |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | µg/L | 0.05 | <0.05             | <0.05             | 0                 | <0.05 | <0.05  | 0  | <0.05             | <0.05             | 0  | <0.05 | <0.05 | 0                 |                   |  |  |  |                   |                   |                   |                   |                   |
| PFAS                                                      |      |      |                   |                   |                   |       |        |    |                   |                   |    |       |       |                   |                   |  |  |  |                   |                   |                   |                   |                   |
| Sum of PFHxS and PFOS                                     | µg/L | 0.01 | 87.7              | 102               | 15                | 87.7  | 88     | 0  | 0.99              | 1.76              | 56 | 0.99  | 0.82  | 19                |                   |  |  |  |                   |                   |                   |                   |                   |
| Sum of PFAS (WA DER List)                                 | µg/L | 0.01 | 174               | 194               | 11                | 174   | 135.25 | 25 | 1.41              | 2.45              | 54 | 1.41  | 1.13  | 22                |                   |  |  |  |                   |                   |                   |                   |                   |
| Sum of PFAS                                               | µg/L | 0.01 | 185               | 206               | 11                | 185   | 148.22 | 22 | 1.59              | 2.76              | 54 | 1.59  | 1.38  | 14                |                   |  |  |  |                   |                   |                   |                   |                   |
| Sum of enHealth PFAS (PFHxS + PFOS + PFOA)                | µg/L | 0.01 |                   |                   |                   |       | 92     |    |                   |                   |    |       | 0.83  |                   |                   |  |  |  |                   |                   |                   |                   |                   |
| Sum of PFAS (PFOS + PFOA)                                 | µg/L | 0.01 |                   |                   |                   |       | 57     |    |                   |                   |    |       | 0.04  |                   |                   |  |  |  |                   |                   |                   |                   |                   |

|                                                           |      | 24/11/2021              | 24/11/2021        |     | 24/11/2021              | 24/11/2021        |     | 24/11/2021              | 24/11/2021        |     | 24/11/2021              | 24/11/2021        |
|-----------------------------------------------------------|------|-------------------------|-------------------|-----|-------------------------|-------------------|-----|-------------------------|-------------------|-----|-------------------------|-------------------|
|                                                           |      | 0960_MW145_5-5.5_211124 | 0960_QC118_211124 |     | 0960_MW145_5-5.5_211124 | 0960_QC218_211124 |     | 0960_MW138_3-3.5_211124 | 0960_QC120_211124 |     | 0960_MW138_3-3.5_211124 | 0960_QC220_211124 |
|                                                           |      | Water                   | Water             |     | Water                   | Water             |     | Water                   | Water             |     | Water                   | Water             |
|                                                           |      | EP2114394               | EP2114394         | RPD | EP2114394               | 845088            | RPD | EP2114394               | EP2114394         | RPD | EP2114394               | 845088            |
|                                                           | Unit |                         |                   |     |                         |                   |     |                         |                   |     |                         |                   |
| PFAS - Perfluoroalkyl Sulfonic Acids                      |      |                         |                   |     |                         |                   |     |                         |                   |     |                         |                   |
| Perfluoropropanesulfonic acid (PFPrS)                     | µg/L |                         |                   |     |                         | <0.01             |     |                         |                   |     |                         | <0.01             |
| Perfluorobutane sulfonic acid (PFBS)                      | µg/L | <0.02                   | <0.02             | 0   | <0.02                   | <0.01             | 0   | <0.02                   | <0.02             | 0   | <0.02                   | <0.01             |
| Perfluoropentane sulfonic acid (PFPeS)                    | µg/L | <0.02                   | <0.02             | 0   | <0.02                   | <0.01             | 0   | <0.02                   | <0.02             | 0   | <0.02                   | <0.01             |
| Perfluorohexane sulfonic acid (PFHxS)                     | µg/L | <0.01                   | <0.01             | 0   | <0.01                   | <0.01             | 0   | <0.01                   | <0.01             | 0   | <0.01                   | <0.01             |
| Perfluoroheptane sulfonic acid (PFHpS)                    | µg/L | <0.02                   | <0.02             | 0   | <0.02                   | <0.01             | 0   | <0.02                   | <0.02             | 0   | <0.02                   | <0.01             |
| Perfluorooctane sulfonic acid (PFOS)                      | µg/L | <0.01                   | <0.01             | 0   | <0.01                   | <0.01             | 0   | 0.03                    | <0.01             | 100 | 0.03                    | <0.01             |
| Perfluorononanesulfonic acid (PFNS)                       | µg/L |                         |                   |     |                         | <0.01             |     |                         |                   |     |                         | <0.01             |
| Perfluorodecane sulfonic acid (PFDS)                      | µg/L | <0.02                   | <0.02             | 0   | <0.02                   | <0.01             | 0   | <0.02                   | <0.02             | 0   | <0.02                   | <0.01             |
| PFAS - Perfluoroalkyl Carboxylic Acids                    |      |                         |                   |     |                         |                   |     |                         |                   |     |                         |                   |
| Perfluorobutanoic acid (PFBA)                             | µg/L | <0.1                    | <0.1              | 0   | <0.1                    | <0.05             | 0   | <0.1                    | <0.1              | 0   | <0.1                    | <0.05             |
| Perfluoropentanoic acid (PFPeA)                           | µg/L | <0.02                   | <0.02             | 0   | <0.02                   | <0.01             | 0   | <0.02                   | <0.02             | 0   | <0.02                   | <0.01             |
| Perfluorohexanoic acid (PFHxA)                            | µg/L | <0.02                   | <0.02             | 0   | <0.02                   | <0.01             | 0   | <0.02                   | <0.02             | 0   | <0.02                   | <0.01             |
| Perfluoroheptanoic acid (PFHpA)                           | µg/L | <0.02                   | <0.02             | 0   | <0.02                   | <0.01             | 0   | <0.02                   | <0.02             | 0   | <0.02                   | <0.01             |
| Perfluorooctanoic acid (PFOA)                             | µg/L | <0.01                   | <0.01             | 0   | <0.01                   | <0.01             | 0   | <0.01                   | <0.01             | 0   | <0.01                   | <0.01             |
| Perfluorononanoic acid (PFNA)                             | µg/L | <0.02                   | <0.02             | 0   | <0.02                   | <0.01             | 0   | <0.02                   | <0.02             | 0   | <0.02                   | <0.01             |
| Perfluorodecanoic acid (PFDA)                             | µg/L | <0.02                   | <0.02             | 0   | <0.02                   | <0.01             | 0   | <0.02                   | <0.02             | 0   | <0.02                   | <0.01             |
| Perfluoroundecanoic acid (PFUnDA)                         | µg/L | <0.02                   | <0.02             | 0   | <0.02                   | <0.01             | 0   | <0.02                   | <0.02             | 0   | <0.02                   | <0.01             |
| Perfluorododecanoic acid (PFDoDA)                         | µg/L | <0.02                   | <0.02             | 0   | <0.02                   | <0.01             | 0   | <0.02                   | <0.02             | 0   | <0.02                   | <0.01             |
| Perfluorotridecanoic acid (PFTrDA)                        | µg/L | <0.02                   | <0.02             | 0   | <0.02                   | <0.01             | 0   | <0.02                   | <0.02             | 0   | <0.02                   | <0.01             |
| Perfluorotetradecanoic acid (PFTeDA)                      | µg/L | <0.05                   | <0.05             | 0   | <0.05                   | <0.01             | 0   | <0.05                   | <0.05             | 0   | <0.05                   | <0.01             |
| PFAS - (n:2) Fluorotelomer Sulfonic Acids                 |      |                         |                   |     |                         |                   |     |                         |                   |     |                         |                   |
| 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | µg/L | <0.05                   | <0.05             | 0   | <0.05                   | <0.01             | 0   | <0.05                   | <0.05             | 0   | <0.05                   | <0.01             |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | µg/L | <0.05                   | <0.05             | 0   | <0.05                   | <0.05             | 0   | <0.05                   | <0.05             | 0   | <0.05                   | <0.05             |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | µg/L | <0.05                   | <0.05             | 0   | <0.05                   | <0.01             | 0   | <0.05                   | <0.05             | 0   | <0.05                   | <0.01             |
| 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | µg/L | <0.05                   | <0.05             | 0   | <0.05                   | <0.01             | 0   | <0.05                   | <0.05             | 0   | <0.05                   | <0.01             |
| PFAS - Perfluoroalkyl Sulfonamides                        |      |                         |                   |     |                         |                   |     |                         |                   |     |                         |                   |
| Perfluorooctane sulfonamide (FOSA)                        | µg/L | <0.02                   | <0.02             | 0   | <0.02                   | <0.05             | 0   | <0.02                   | <0.02             | 0   | <0.02                   | <0.05             |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)             | µg/L | <0.05                   | <0.05             | 0   | <0.05                   | <0.05             | 0   | <0.05                   | <0.05             | 0   | <0.05                   | <0.05             |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | µg/L | <0.02                   | <0.02             | 0   | <0.02                   | <0.05             | 0   | <0.02                   | <0.02             | 0   | <0.02                   | <0.05             |
| N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | µg/L | <0.05                   | <0.05             | 0   | <0.05                   | <0.05             | 0   | <0.05                   | <0.05             | 0   | <0.05                   | <0.05             |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | µg/L | <0.05                   | <0.05             | 0   | <0.05                   | <0.05             | 0   | <0.05                   | <0.05             | 0   | <0.05                   | <0.05             |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | µg/L | <0.02                   | <0.02             | 0   | <0.02                   | <0.05             | 0   | <0.02                   | <0.02             | 0   | <0.02                   | <0.05             |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | µg/L | <0.05                   | <0.05             | 0   | <0.05                   | <0.05             | 0   | <0.05                   | <0.05             | 0   | <0.05                   | <0.05             |
| PFAS                                                      |      |                         |                   |     |                         |                   |     |                         |                   |     |                         |                   |
| Sum of PFHxS and PFOS                                     | µg/L | <0.01                   | <0.01             | 0   | <0.01                   | <0.01             | 0   | 0.03                    | <0.01             | 100 | 0.03                    | <0.01             |
| Sum of PFAS (WA DER List)                                 | µg/L | <0.01                   | <0.01             | 0   | <0.01                   | <0.05             | 0   | 0.03                    | <0.01             | 100 | 0.03                    | <0.05             |
| Sum of PFAS                                               | µg/L | <0.01                   | <0.01             | 0   | <0.01                   | <0.1              | 0   | 0.03                    | <0.01             | 100 | 0.03                    | <0.1              |
| Sum of enHealth PFAS (PFHxS + PFOS + PFOA)                | µg/L |                         |                   |     |                         | <0.01             |     |                         |                   |     |                         | <0.01             |
| Sum of PFAS (PFOS + PFOA)                                 | µg/L |                         |                   |     |                         | <0.01             |     |                         |                   |     |                         | <0.01             |

\*RPDs have only been considered where a concentration  
\*\*Elevated RPDs are highlighted as per QAQC Profile sett  
\*\*\*Interlab Duplicates are matched on a per compound b

|                                                           |      | RPD | 24/11/2021        | 24/11/2021        | RPD | 24/11/2021        | 24/11/2021        | RPD | 24/11/2021        | 24/11/2021        | RPD | 24/11/2021        | 24/11/2021        | RPD |
|-----------------------------------------------------------|------|-----|-------------------|-------------------|-----|-------------------|-------------------|-----|-------------------|-------------------|-----|-------------------|-------------------|-----|
|                                                           |      |     | 0960_MW233_211124 | 0960_QC124_211124 |     | 0960_MW233_211124 | 0960_QC224_211124 |     | 0960_SW305_211124 | 0960_QC123_211124 |     | 0960_SW305_211124 | 0960_QC223_211124 |     |
|                                                           |      |     | Water             | Water             |     | Water             | Water             |     | Water             | Water             |     | Water             | Water             |     |
|                                                           | Unit |     | EP2114395         | EP2114395         |     | EP2114395         | 845088            |     | EP2114398         | EP2114398         |     | EP2114398         | 845088            |     |
|                                                           |      |     |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| PFAS - Perfluoroalkyl Sulfonic Acids                      |      |     |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| Perfluoropropanesulfonic acid (PFPrS)                     | µg/L |     |                   |                   |     |                   | 0.01              |     |                   |                   |     |                   | <0.01             |     |
| Perfluorobutane sulfonic acid (PFBS)                      | µg/L | 0   | 0.08              | 0.09              | 12  | 0.08              | 0.06              | 29  | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   |
| Perfluoropentane sulfonic acid (PFPeS)                    | µg/L | 0   | 0.10              | 0.11              | 10  | 0.10              | 0.06              | 50  | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   |
| Perfluorohexane sulfonic acid (PFHxS)                     | µg/L | 0   | 2.08              | 2.19              | 5   | 2.08              | 1.7               | 20  | <0.01             | <0.01             | 0   | <0.01             | <0.01             | 0   |
| Perfluoroheptane sulfonic acid (PFHpS)                    | µg/L | 0   | 0.18              | 0.16              | 12  | 0.18              | 0.19              | 5   | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   |
| Perfluorooctane sulfonic acid (PFOS)                      | µg/L | 100 | 2.11              | 1.91              | 10  | 2.11              | 1.7               | 22  | <0.01             | <0.01             | 0   | <0.01             | <0.01             | 0   |
| Perfluorononanesulfonic acid (PFNS)                       | µg/L |     |                   |                   |     |                   | <0.01             |     |                   |                   |     |                   | <0.01             |     |
| Perfluorodecane sulfonic acid (PFDS)                      | µg/L | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   |
| PFAS - Perfluoroalkyl Carboxylic Acids                    |      |     |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| Perfluorobutanoic acid (PFBA)                             | µg/L | 0   | <0.1              | <0.1              | 0   | <0.1              | 0.07              | 0   | <0.1              | <0.1              | 0   | <0.1              | <0.05             | 0   |
| Perfluoropentanoic acid (PFPeA)                           | µg/L | 0   | 0.05              | 0.05              | 0   | 0.05              | 0.03              | 50  | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   |
| Perfluorohexanoic acid (PFHxA)                            | µg/L | 0   | 0.28              | 0.26              | 7   | 0.28              | 0.21              | 29  | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   |
| Perfluoroheptanoic acid (PFHpA)                           | µg/L | 0   | 0.04              | 0.03              | 29  | 0.04              | 0.03              | 29  | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   |
| Perfluorooctanoic acid (PFOA)                             | µg/L | 0   | 0.22              | 0.21              | 5   | 0.22              | 0.12              | 59  | <0.01             | <0.01             | 0   | <0.01             | <0.01             | 0   |
| Perfluorononanoic acid (PFNA)                             | µg/L | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   |
| Perfluorodecanoic acid (PFDA)                             | µg/L | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   |
| Perfluoroundecanoic acid (PFUnDA)                         | µg/L | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   |
| Perfluorododecanoic acid (PFDoDA)                         | µg/L | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   |
| Perfluorotridecanoic acid (PFTrDA)                        | µg/L | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   |
| Perfluorotetradecanoic acid (PFTeDA)                      | µg/L | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.01             | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.01             | 0   |
| PFAS - (n:2) Fluorotelomer Sulfonic Acids                 |      |     |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | µg/L | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.01             | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.01             | 0   |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | µg/L | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.05             | 0   |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | µg/L | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.01             | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.01             | 0   |
| 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | µg/L | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.01             | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.01             | 0   |
| PFAS - Perfluoroalkyl Sulfonamides                        |      |     |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| Perfluorooctane sulfonamide (FOSA)                        | µg/L | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.05             | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.05             | 0   |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)             | µg/L | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.05             | 0   |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | µg/L | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.05             | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.05             | 0   |
| N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | µg/L | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.05             | 0   |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | µg/L | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.05             | 0   |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | µg/L | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.05             | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.05             | 0   |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | µg/L | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.05             | 0   |
| PFAS                                                      |      |     |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| Sum of PFHxS and PFOS                                     | µg/L | 100 | 4.19              | 4.10              | 2   | 4.19              | 3.4               | 21  | <0.01             | <0.01             | 0   | <0.01             | <0.01             | 0   |
| Sum of PFAS (WA DER List)                                 | µg/L | 0   | 4.86              | 4.74              | 3   | 4.86              | 3.92              | 21  | <0.01             | <0.01             | 0   | <0.01             | <0.05             | 0   |
| Sum of PFAS                                               | µg/L | 0   | 5.14              | 5.01              | 3   | 5.14              | 4.18              | 21  | <0.01             | <0.01             | 0   | <0.01             | <0.1              | 0   |
| Sum of enHealth PFAS (PFHxS + PFOS + PFOA)                | µg/L |     |                   |                   |     |                   | 3.52              |     |                   |                   |     |                   | <0.01             |     |
| Sum of PFAS (PFOS + PFOA)                                 | µg/L |     |                   |                   |     |                   | 1.82              |     |                   |                   |     |                   | <0.01             |     |

\*RPDs have only been considered where a concentration  
\*\*Elevated RPDs are highlighted as per QAQC Profile sett  
\*\*\*Interlab Duplicates are matched on a per compound b



|                                                           | Unit | 24/11/2021        | 24/11/2021        | RPD | 24/11/2021        | 24/11/2021        | RPD | 24/11/2021        | 24/11/2021        | RPD | 24/11/2021        | 24/11/2021        | RPD |
|-----------------------------------------------------------|------|-------------------|-------------------|-----|-------------------|-------------------|-----|-------------------|-------------------|-----|-------------------|-------------------|-----|
|                                                           |      | 0960_SW300_211124 | 0960_QC126_211124 |     | 0960_SW300_211124 | 0960_QC226_211124 |     | 0960_MW168_211124 | 0960_QC127_211124 |     | 0960_MW168_211124 | 0960_QC227_211124 |     |
|                                                           |      | Water             | Water             |     | Water             | Water             |     | Water             | Water             |     | Water             | Water             |     |
|                                                           |      | EP2114398         | EP2114398         |     | EP2114398         | 845088            |     | EP2114395         | EP2114395         |     | EP2114395         | 845088            |     |
| PFAS - Perfluoroalkyl Sulfonic Acids                      |      |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| Perfluoropropanesulfonic acid (PFPrS)                     | µg/L |                   |                   |     |                   | <0.01             |     |                   |                   |     |                   | 0.04              |     |
| Perfluorobutane sulfonic acid (PFBS)                      | µg/L | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   | 0.13              | 0.13              | 0   | 0.13              | 0.11              | 17  |
| Perfluoropentane sulfonic acid (PFPeS)                    | µg/L | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   | 0.13              | 0.12              | 8   | 0.13              | 0.09              | 36  |
| Perfluorohexane sulfonic acid (PFHxS)                     | µg/L | <0.01             | <0.01             | 0   | <0.01             | <0.01             | 0   | 1.22              | 1.18              | 3   | 1.22              | 0.89              | 31  |
| Perfluoroheptane sulfonic acid (PFHpS)                    | µg/L | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   | <0.02             | <0.02             | 0   | <0.02             | 0.01              | 0   |
| Perfluorooctane sulfonic acid (PFOS)                      | µg/L | <0.01             | <0.01             | 0   | <0.01             | <0.01             | 0   | 0.12              | 0.13              | 8   | 0.12              | 0.05              | 82  |
| Perfluorononanesulfonic acid (PFNS)                       | µg/L |                   |                   |     |                   | <0.01             |     |                   |                   |     |                   | <0.01             |     |
| Perfluorodecane sulfonic acid (PFDS)                      | µg/L | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   |
| PFAS - Perfluoroalkyl Carboxylic Acids                    |      |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| Perfluorobutanoic acid (PFBA)                             | µg/L | <0.1              | <0.1              | 0   | <0.1              | <0.05             | 0   | <0.1              | <0.1              | 0   | <0.1              | <0.05             | 0   |
| Perfluoropentanoic acid (PFPeA)                           | µg/L | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   | 0.09              | 0.08              | 12  | 0.09              | 0.06              | 40  |
| Perfluorohexanoic acid (PFHxA)                            | µg/L | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   | 0.45              | 0.42              | 7   | 0.45              | 0.43              | 5   |
| Perfluoroheptanoic acid (PFHpA)                           | µg/L | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   | 0.04              | 0.04              | 0   | 0.04              | 0.03              | 29  |
| Perfluorooctanoic acid (PFOA)                             | µg/L | <0.01             | <0.01             | 0   | <0.01             | <0.01             | 0   | 0.04              | 0.03              | 29  | 0.04              | 0.02              | 67  |
| Perfluorononanoic acid (PFNA)                             | µg/L | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   |
| Perfluorodecanoic acid (PFDA)                             | µg/L | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   |
| Perfluoroundecanoic acid (PFUnDA)                         | µg/L | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   |
| Perfluorododecanoic acid (PFDoDA)                         | µg/L | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   |
| Perfluorotridecanoic acid (PFTrDA)                        | µg/L | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   |
| Perfluorotetradecanoic acid (PFTeDA)                      | µg/L | <0.05             | <0.05             | 0   | <0.05             | <0.01             | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.01             | 0   |
| PFAS - (n:2) Fluorotelomer Sulfonic Acids                 |      |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | µg/L | <0.05             | <0.05             | 0   | <0.05             | <0.01             | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.01             | 0   |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | µg/L | <0.05             | <0.05             | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.05             | 0   |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | µg/L | <0.05             | <0.05             | 0   | <0.05             | <0.01             | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.01             | 0   |
| 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | µg/L | <0.05             | <0.05             | 0   | <0.05             | <0.01             | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.01             | 0   |
| PFAS - Perfluoroalkyl Sulfonamides                        |      |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| Perfluorooctane sulfonamide (FOSA)                        | µg/L | <0.02             | <0.02             | 0   | <0.02             | <0.05             | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.05             | 0   |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)             | µg/L | <0.05             | <0.05             | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.05             | 0   |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | µg/L | <0.02             | <0.02             | 0   | <0.02             | <0.05             | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.05             | 0   |
| N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | µg/L | <0.05             | <0.05             | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.05             | 0   |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | µg/L | <0.05             | <0.05             | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.05             | 0   |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | µg/L | <0.02             | <0.02             | 0   | <0.02             | <0.05             | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.05             | 0   |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | µg/L | <0.05             | <0.05             | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.05             | 0   |
| PFAS                                                      |      |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| Sum of PFHxS and PFOS                                     | µg/L | <0.01             | <0.01             | 0   | <0.01             | <0.01             | 0   | 1.34              | 1.31              | 2   | 1.34              | 0.94              | 35  |
| Sum of PFAS (WA DER List)                                 | µg/L | <0.01             | <0.01             | 0   | <0.01             | <0.05             | 0   | 2.09              | 2.01              | 4   | 2.09              | 1.59              | 27  |
| Sum of PFAS                                               | µg/L | <0.01             | <0.01             | 0   | <0.01             | <0.1              | 0   | 2.22              | 2.13              | 4   | 2.22              | 1.73              | 25  |
| Sum of enHealth PFAS (PFHxS + PFOS + PFOA)                | µg/L |                   |                   |     |                   | <0.01             |     |                   |                   |     |                   | 0.96              |     |
| Sum of PFAS (PFOS + PFOA)                                 | µg/L |                   |                   |     |                   | <0.01             |     |                   |                   |     |                   | 0.07              |     |

\*RPDs have only been considered where a concentration  
 \*\*Elevated RPDs are highlighted as per QAQC Profile sett  
 \*\*\*Interlab Duplicates are matched on a per compound b

|                                                           |      | 24/11/2021        | 24/11/2021        | RPD | 24/11/2021        | 24/11/2021        | RPD |
|-----------------------------------------------------------|------|-------------------|-------------------|-----|-------------------|-------------------|-----|
|                                                           |      | 0960_SW209_211124 | 0960_QC128_211124 |     | 0960_SW209_211124 | 0960_QC228_211124 |     |
|                                                           |      | Water             | Water             |     | Water             | Water             |     |
|                                                           |      | EP2114399         | EP2114399         |     | EP2114399         | 845088            |     |
|                                                           | Unit |                   |                   |     |                   |                   |     |
| PFAS - Perfluoroalkyl Sulfonic Acids                      |      |                   |                   |     |                   |                   |     |
| Perfluoropropanesulfonic acid (PFPrS)                     | µg/L |                   |                   |     |                   | <0.01             |     |
| Perfluorobutane sulfonic acid (PFBS)                      | µg/L | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   |
| Perfluoropentane sulfonic acid (PFPeS)                    | µg/L | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   |
| Perfluorohexane sulfonic acid (PFHxS)                     | µg/L | <0.01             | <0.01             | 0   | <0.01             | <0.01             | 0   |
| Perfluoroheptane sulfonic acid (PFHpS)                    | µg/L | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   |
| Perfluorooctane sulfonic acid (PFOS)                      | µg/L | <0.01             | <0.01             | 0   | <0.01             | <0.01             | 0   |
| Perfluorononanesulfonic acid (PFNS)                       | µg/L |                   |                   |     |                   | <0.01             |     |
| Perfluorodecane sulfonic acid (PFDS)                      | µg/L | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   |
| PFAS - Perfluoroalkyl Carboxylic Acids                    |      |                   |                   |     |                   |                   |     |
| Perfluorobutanoic acid (PFBA)                             | µg/L | <0.1              | <0.1              | 0   | <0.1              | <0.05             | 0   |
| Perfluoropentanoic acid (PFPeA)                           | µg/L | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   |
| Perfluorohexanoic acid (PFHxA)                            | µg/L | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   |
| Perfluoroheptanoic acid (PFHpA)                           | µg/L | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   |
| Perfluorooctanoic acid (PFOA)                             | µg/L | <0.01             | <0.01             | 0   | <0.01             | <0.01             | 0   |
| Perfluorononanoic acid (PFNA)                             | µg/L | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   |
| Perfluorodecanoic acid (PFDA)                             | µg/L | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   |
| Perfluoroundecanoic acid (PFUnDA)                         | µg/L | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   |
| Perfluorododecanoic acid (PFDoDA)                         | µg/L | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   |
| Perfluorotridecanoic acid (PFTTrDA)                       | µg/L | <0.02             | <0.02             | 0   | <0.02             | <0.01             | 0   |
| Perfluorotetradecanoic acid (PFTeDA)                      | µg/L | <0.05             | <0.05             | 0   | <0.05             | <0.01             | 0   |
| PFAS - (n:2) Fluorotelomer Sulfonic Acids                 |      |                   |                   |     |                   |                   |     |
| 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | µg/L | <0.05             | <0.05             | 0   | <0.05             | <0.01             | 0   |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | µg/L | <0.05             | <0.05             | 0   | <0.05             | <0.05             | 0   |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | µg/L | <0.05             | <0.05             | 0   | <0.05             | <0.01             | 0   |
| 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | µg/L | <0.05             | <0.05             | 0   | <0.05             | <0.01             | 0   |
| PFAS - Perfluoroalkyl Sulfonamides                        |      |                   |                   |     |                   |                   |     |
| Perfluorooctane sulfonamide (FOSA)                        | µg/L | <0.02             | <0.02             | 0   | <0.02             | <0.05             | 0   |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)             | µg/L | <0.05             | <0.05             | 0   | <0.05             | <0.05             | 0   |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | µg/L | <0.02             | <0.02             | 0   | <0.02             | <0.05             | 0   |
| N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | µg/L | <0.05             | <0.05             | 0   | <0.05             | <0.05             | 0   |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | µg/L | <0.05             | <0.05             | 0   | <0.05             | <0.05             | 0   |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | µg/L | <0.02             | <0.02             | 0   | <0.02             | <0.05             | 0   |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | µg/L | <0.05             | <0.05             | 0   | <0.05             | <0.05             | 0   |
| PFAS                                                      |      |                   |                   |     |                   |                   |     |
| Sum of PFHxS and PFOS                                     | µg/L | <0.01             | <0.01             | 0   | <0.01             | <0.01             | 0   |
| Sum of PFAS (WA DER List)                                 | µg/L | <0.01             | <0.01             | 0   | <0.01             | <0.05             | 0   |
| Sum of PFAS                                               | µg/L | <0.01             | <0.01             | 0   | <0.01             | <0.1              | 0   |
| Sum of enHealth PFAS (PFHxS + PFOS + PFOA)                | µg/L |                   |                   |     |                   | <0.01             |     |
| Sum of PFAS (PFOS + PFOA)                                 | µg/L |                   |                   |     |                   | <0.01             |     |

\*RPDs have only been considered where a concentration

\*\*Elevated RPDs are highlighted as per QAQC Profile sett

\*\*\*Interlab Duplicates are matched on a per compound b

| Date                                                      |       |        | 24/11/2021        | 24/11/2021        | RPD | 24/11/2021        | 24/11/2021        | RPD | 24/11/2021        | 24/11/2021        | RPD | 24/11/2021        | 24/11/2021        | RPD |
|-----------------------------------------------------------|-------|--------|-------------------|-------------------|-----|-------------------|-------------------|-----|-------------------|-------------------|-----|-------------------|-------------------|-----|
| Field ID                                                  |       |        | 0960_SS114_211124 | 0960_QC117_211124 |     | 0960_SS114_211124 | 0960_QC217_211124 |     | 0960_SS190_211124 | 0960_QC119_211124 |     | 0960_SS190_211124 | 0960_QC219_211124 |     |
| Matrix Type                                               |       |        | Soil              | Soil              |     | Soil              | Soil              |     | Soil              | Soil              |     | Soil              | Soil              |     |
| Lab Report Number                                         |       |        | EP2114393         | EP2114393         |     | EP2114393         | EP2114393         |     | EP2114393         | EP2114393         |     | EP2114393         | 845088            |     |
|                                                           | Unit  | EQL    |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| PFAS - Perfluoroalkyl Sulfonic Acids                      |       |        |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| Perfluoropropanesulfonic acid (PFPrS)                     | mg/kg | 0.005  |                   |                   |     |                   | <0.005            |     |                   |                   |     |                   | <0.005            |     |
| Perfluorobutane sulfonic acid (PFBS)                      | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   |
| Perfluoropentane sulfonic acid (PFPeS)                    | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   |
| Perfluorohexane sulfonic acid (PFHxS)                     | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   | 0.0003            | 0.0003            | 0   | 0.0003            | <0.005            | 0   |
| Perfluoroheptane sulfonic acid (PFHpS)                    | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   |
| Perfluorooctane sulfonic acid (PFOS)                      | mg/kg | 0.0002 | 0.0053            | 0.0050            | 6   | 0.0053            | 0.0050            | 6   | 0.0110            | 0.0143            | 26  | 0.0110            | 0.019             | 53  |
| Perfluorononanesulfonic acid (PFNS)                       | mg/kg | 0.005  |                   |                   |     |                   | <0.005            |     |                   |                   |     |                   | <0.005            |     |
| Perfluorodecane sulfonic acid (PFDS)                      | mg/kg | 0.0002 | 0.0007            | 0.0006            | 15  | 0.0007            | <0.005            | 0   | <0.0002           | 0.0006            | 100 | <0.0002           | <0.005            | 0   |
| PFAS - Perfluoroalkyl Carboxylic Acids                    |       |        |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| Perfluorobutanoic acid (PFBA)                             | mg/kg | 0.001  | <0.001            | <0.001            | 0   | <0.001            | <0.005            | 0   | <0.001            | <0.001            | 0   | <0.001            | <0.005            | 0   |
| Perfluoropentanoic acid (PFPeA)                           | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   |
| Perfluorohexanoic acid (PFHxA)                            | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   |
| Perfluoroheptanoic acid (PFHpA)                           | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   |
| Perfluorooctanoic acid (PFOA)                             | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   |
| Perfluorononanoic acid (PFNA)                             | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   |
| Perfluorodecanoic acid (PFDA)                             | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   |
| Perfluoroundecanoic acid (PFUnDA)                         | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   |
| Perfluorododecanoic acid (PFDoDA)                         | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   |
| Perfluorotridecanoic acid (PFTrDA)                        | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   |
| Perfluorotetradecanoic acid (PFTeDA)                      | mg/kg | 0.0005 | <0.0005           | <0.0005           | 0   | <0.0005           | <0.005            | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.005            | 0   |
| PFAS - (n:2) Fluorotelomer Sulfonic Acids                 |       |        |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | mg/kg | 0.0005 | <0.0005           | <0.0005           | 0   | <0.0005           | <0.005            | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.005            | 0   |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | mg/kg | 0.0005 | <0.0005           | <0.0005           | 0   | <0.0005           | <0.01             | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.01             | 0   |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | mg/kg | 0.0005 | <0.0005           | <0.0005           | 0   | <0.0005           | <0.005            | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.005            | 0   |
| 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | mg/kg | 0.0005 | <0.0005           | <0.0005           | 0   | <0.0005           | <0.005            | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.005            | 0   |
| PFAS - Perfluoroalkyl Sulfonamides                        |       |        |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| Perfluorooctane sulfonamide (FOSA)                        | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)             | mg/kg | 0.0005 | <0.0005           | <0.0005           | 0   | <0.0005           | <0.005            | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.005            | 0   |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.01             | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.01             | 0   |
| N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | mg/kg | 0.0005 | <0.0005           | <0.0005           | 0   | <0.0005           | <0.005            | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.005            | 0   |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | mg/kg | 0.0005 | <0.0005           | <0.0005           | 0   | <0.0005           | <0.005            | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.005            | 0   |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.01             | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.01             | 0   |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | mg/kg | 0.0005 | <0.0005           | <0.0005           | 0   | <0.0005           | <0.005            | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.005            | 0   |
| PFAS                                                      |       |        |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| Sum of PFHxS and PFOS                                     | mg/kg | 0.0002 | 0.0053            | 0.0050            | 6   | 0.0053            | 0.005             | 6   | 0.0113            | 0.0146            | 25  | 0.0113            | 0.019             | 51  |
| Sum of PFAS (WA DER List)                                 | mg/kg | 0.0002 | 0.0053            | 0.0050            | 6   | 0.0053            | <0.01             | 0   | 0.0113            | 0.0146            | 25  | 0.0113            | 0.019             | 51  |
| Sum of PFAS                                               | mg/kg | 0.0002 | 0.0060            | 0.0056            | 7   | 0.0060            | <0.05             | 0   | 0.0113            | 0.0152            | 29  | 0.0113            | <0.05             | 0   |
| Sum of enHealth PFAS (PFHxS + PFOS + PFOA)                | mg/kg | 0.005  |                   |                   |     |                   | 0.005             |     |                   |                   |     |                   | 0.019             |     |
| Sum of PFAS (PFOS + PFOA)                                 | mg/kg | 0.005  |                   |                   |     |                   | 0.005             |     |                   |                   |     |                   | 0.019             |     |

\*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: No Limit (1 - 10 x EQL); 50 (10 - 20 x EQL); 20 ( &gt; 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



|                                                           |       | 24/11/2021        | 24/11/2021        | RPD | 24/11/2021        | 24/11/2021        | RPD | 24/11/2021        | 24/11/2021        | RPD | 24/11/2021        | 24/11/2021        | RPD |
|-----------------------------------------------------------|-------|-------------------|-------------------|-----|-------------------|-------------------|-----|-------------------|-------------------|-----|-------------------|-------------------|-----|
|                                                           |       | 0960_SS227_211124 | 0960_QC121_211124 |     | 0960_SS227_211124 | 0960_QC221_211124 |     | 0960_SS123_211124 | 0960_QC122_211124 |     | 0960_SS123_211124 | 0960_QC222_211124 |     |
|                                                           |       | Soil              | Soil              |     | Soil              | Soil              |     | Soil              | Soil              |     | Soil              | Soil              |     |
|                                                           |       | EP2114396         | EP2114396         |     | EP2114396         | 845088            |     | EP2114397         | EP2114397         |     | EP2114397         | 845088            |     |
|                                                           | Unit  |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| PFAS - Perfluoroalkyl Sulfonic Acids                      |       |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| Perfluoropropanesulfonic acid (PFPrS)                     | mg/kg |                   |                   |     |                   | <0.005            |     |                   |                   |     |                   | <0.005            |     |
| Perfluorobutane sulfonic acid (PFBS)                      | mg/kg | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   |
| Perfluoropentane sulfonic acid (PFPeS)                    | mg/kg | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   |
| Perfluorohexane sulfonic acid (PFHxS)                     | mg/kg | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   | 0.0003            | 0.0005            | 50  | 0.0003            | <0.005            | 0   |
| Perfluoroheptane sulfonic acid (PFHpS)                    | mg/kg | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   |
| Perfluorooctane sulfonic acid (PFOS)                      | mg/kg | 0.0238            | 0.0199            | 18  | 0.0238            | 0.014             | 52  | 0.0323            | 0.0347            | 7   | 0.0323            | 0.035             | 8   |
| Perfluorononanesulfonic acid (PFNS)                       | mg/kg |                   |                   |     |                   | <0.005            |     |                   |                   |     |                   | <0.005            |     |
| Perfluorodecane sulfonic acid (PFDS)                      | mg/kg | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   | 0.0012            | 0.0010            | 18  | 0.0012            | <0.005            | 0   |
| PFAS - Perfluoroalkyl Carboxylic Acids                    |       |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| Perfluorobutanoic acid (PFBA)                             | mg/kg | <0.001            | <0.001            | 0   | <0.001            | <0.005            | 0   | <0.001            | <0.001            | 0   | <0.001            | <0.005            | 0   |
| Perfluoropentanoic acid (PFPeA)                           | mg/kg | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   |
| Perfluorohexanoic acid (PFHxA)                            | mg/kg | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   |
| Perfluoroheptanoic acid (PFHpA)                           | mg/kg | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   |
| Perfluorooctanoic acid (PFOA)                             | mg/kg | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   |
| Perfluorononanoic acid (PFNA)                             | mg/kg | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   |
| Perfluorodecanoic acid (PFDA)                             | mg/kg | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   |
| Perfluoroundecanoic acid (PFUnDA)                         | mg/kg | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   |
| Perfluorododecanoic acid (PFDoDA)                         | mg/kg | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   |
| Perfluorotridecanoic acid (PFTTrDA)                       | mg/kg | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   |
| Perfluorotetradecanoic acid (PFTeDA)                      | mg/kg | <0.0005           | <0.0005           | 0   | <0.0005           | <0.005            | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.005            | 0   |
| PFAS - (n:2) Fluorotelomer Sulfonic Acids                 |       |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | mg/kg | <0.0005           | <0.0005           | 0   | <0.0005           | <0.005            | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.005            | 0   |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | mg/kg | <0.0005           | <0.0005           | 0   | <0.0005           | <0.01             | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.01             | 0   |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | mg/kg | <0.0005           | <0.0005           | 0   | <0.0005           | <0.005            | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.005            | 0   |
| 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | mg/kg | <0.0005           | <0.0005           | 0   | <0.0005           | <0.005            | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.005            | 0   |
| PFAS - Perfluoroalkyl Sulfonamides                        |       |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| Perfluorooctane sulfonamide (FOSA)                        | mg/kg | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)             | mg/kg | <0.0005           | <0.0005           | 0   | <0.0005           | <0.005            | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.005            | 0   |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | mg/kg | <0.0002           | <0.0002           | 0   | <0.0002           | <0.01             | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.01             | 0   |
| N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | mg/kg | <0.0005           | <0.0005           | 0   | <0.0005           | <0.005            | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.005            | 0   |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | mg/kg | <0.0005           | <0.0005           | 0   | <0.0005           | <0.005            | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.005            | 0   |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | mg/kg | <0.0002           | <0.0002           | 0   | <0.0002           | <0.01             | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.01             | 0   |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | mg/kg | <0.0005           | <0.0005           | 0   | <0.0005           | <0.005            | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.005            | 0   |
| PFAS                                                      |       |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| Sum of PFHxS and PFOS                                     | mg/kg | 0.0238            | 0.0199            | 18  | 0.0238            | 0.014             | 52  | 0.0326            | 0.0352            | 8   | 0.0326            | 0.035             | 7   |
| Sum of PFAS (WA DER List)                                 | mg/kg | 0.0238            | 0.0199            | 18  | 0.0238            | 0.014             | 52  | 0.0326            | 0.0352            | 8   | 0.0326            | 0.035             | 7   |
| Sum of PFAS                                               | mg/kg | 0.0238            | 0.0199            | 18  | 0.0238            | <0.05             | 0   | 0.0338            | 0.0362            | 7   | 0.0338            | <0.05             | 0   |
| Sum of enHealth PFAS (PFHxS + PFOS + PFOA)                | mg/kg |                   |                   |     |                   | 0.014             |     |                   |                   |     |                   | 0.035             |     |
| Sum of PFAS (PFOS + PFOA)                                 | mg/kg |                   |                   |     |                   | 0.014             |     |                   |                   |     |                   | 0.035             |     |

\*RPDs have only been considered where a concentration

\*\*Elevated RPDs are highlighted as per QAQC Profile sett

\*\*\*Interlab Duplicates are matched on a per compound l

|                                                           |       | 24/11/2021        | 24/11/2021        | RPD | 24/11/2021        | 24/11/2021        | RPD |
|-----------------------------------------------------------|-------|-------------------|-------------------|-----|-------------------|-------------------|-----|
|                                                           |       | 0960_SS198_211124 | 0960_QC125_211124 |     | 0960_SS198_211124 | 0960_QC225_211124 |     |
|                                                           |       | Soil              | Soil              |     | Soil              | Soil              |     |
|                                                           |       | EP2114396         | EP2114396         |     | EP2114396         | 845088            |     |
|                                                           | Unit  |                   |                   |     |                   |                   |     |
| PFAS - Perfluoroalkyl Sulfonic Acids                      |       |                   |                   |     |                   |                   |     |
| Perfluoropropanesulfonic acid (PFPrS)                     | mg/kg |                   |                   |     |                   | <0.005            |     |
| Perfluorobutane sulfonic acid (PFBS)                      | mg/kg | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   |
| Perfluoropentane sulfonic acid (PFPeS)                    | mg/kg | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   |
| Perfluorohexane sulfonic acid (PFHxS)                     | mg/kg | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   |
| Perfluoroheptane sulfonic acid (PFHpS)                    | mg/kg | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   |
| Perfluorooctane sulfonic acid (PFOS)                      | mg/kg | 0.0035            | 0.0029            | 19  | 0.0035            | 0.0060            | 53  |
| Perfluorononanesulfonic acid (PFNS)                       | mg/kg |                   |                   |     |                   | <0.005            |     |
| Perfluorodecane sulfonic acid (PFDS)                      | mg/kg | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   |
| PFAS - Perfluoroalkyl Carboxylic Acids                    |       |                   |                   |     |                   |                   |     |
| Perfluorobutanoic acid (PFBA)                             | mg/kg | <0.001            | <0.001            | 0   | <0.001            | <0.005            | 0   |
| Perfluoropentanoic acid (PFPeA)                           | mg/kg | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   |
| Perfluorohexanoic acid (PFHxA)                            | mg/kg | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   |
| Perfluoroheptanoic acid (PFHpA)                           | mg/kg | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   |
| Perfluorooctanoic acid (PFOA)                             | mg/kg | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   |
| Perfluorononanoic acid (PFNA)                             | mg/kg | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   |
| Perfluorodecanoic acid (PFDA)                             | mg/kg | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   |
| Perfluoroundecanoic acid (PFUnDA)                         | mg/kg | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   |
| Perfluorododecanoic acid (PFDoDA)                         | mg/kg | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   |
| Perfluorotridecanoic acid (PFTrDA)                        | mg/kg | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   |
| Perfluorotetradecanoic acid (PFTeDA)                      | mg/kg | <0.0005           | <0.0005           | 0   | <0.0005           | <0.005            | 0   |
| PFAS - (n:2) Fluorotelomer Sulfonic Acids                 |       |                   |                   |     |                   |                   |     |
| 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | mg/kg | <0.0005           | <0.0005           | 0   | <0.0005           | <0.005            | 0   |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | mg/kg | <0.0005           | <0.0005           | 0   | <0.0005           | <0.01             | 0   |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | mg/kg | <0.0005           | <0.0005           | 0   | <0.0005           | <0.005            | 0   |
| 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | mg/kg | <0.0005           | <0.0005           | 0   | <0.0005           | <0.005            | 0   |
| PFAS - Perfluoroalkyl Sulfonamides                        |       |                   |                   |     |                   |                   |     |
| Perfluorooctane sulfonamide (FOSA)                        | mg/kg | <0.0002           | <0.0002           | 0   | <0.0002           | <0.005            | 0   |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)             | mg/kg | <0.0005           | <0.0005           | 0   | <0.0005           | <0.005            | 0   |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | mg/kg | <0.0002           | <0.0002           | 0   | <0.0002           | <0.01             | 0   |
| N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | mg/kg | <0.0005           | <0.0005           | 0   | <0.0005           | <0.005            | 0   |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | mg/kg | <0.0005           | <0.0005           | 0   | <0.0005           | <0.005            | 0   |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | mg/kg | <0.0002           | <0.0002           | 0   | <0.0002           | <0.01             | 0   |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | mg/kg | <0.0005           | <0.0005           | 0   | <0.0005           | <0.005            | 0   |
| PFAS                                                      |       |                   |                   |     |                   |                   |     |
| Sum of PFHxS and PFOS                                     | mg/kg | 0.0035            | 0.0029            | 19  | 0.0035            | 0.006             | 53  |
| Sum of PFAS (WA DER List)                                 | mg/kg | 0.0035            | 0.0029            | 19  | 0.0035            | <0.01             | 0   |
| Sum of PFAS                                               | mg/kg | 0.0035            | 0.0029            | 19  | 0.0035            | <0.05             | 0   |
| Sum of enHealth PFAS (PFHxS + PFOS + PFOA)                | mg/kg |                   |                   |     |                   | 0.006             |     |
| Sum of PFAS (PFOS + PFOA)                                 | mg/kg |                   |                   |     |                   | 0.006             |     |

\*RPDs have only been considered where a concentration  
 \*\*Elevated RPDs are highlighted as per QAQC Profile sett  
 \*\*\*Interlab Duplicates are matched on a per compound t

APPENDIX

C

LABORATORY CERTIFICATES





# CHAIN OF CUSTODY

COC# - 30608

ALS Laboratory: EP Perth

CLIENT: CARBSO - CARDNO (WA) PTY LTD

PROJECT: WA 0960 PFASOMP

SITE: MB DEF19009/Learmonth GW

ORDER NO: DEF19009/0960

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:

## SAMPLE DETAILS

## ANALYSIS REQUIRED

| SAMPLE | NAME        | DESCRIPTION | DATE / TIME            | MATRIX | TOTAL BOTTLES        | ON HOLD | Ground Waters Primary WATER | Rinse WATER | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION        |
|--------|-------------|-------------|------------------------|--------|----------------------|---------|-----------------------------|-------------|----------------------|-------------------------------|
| 001    | 0960_MW148D |             | 24/11/2021<br>08:17 AM | Water  | ALS: 5<br>Non ALS: 0 | No      | Partial<br>4/8              |             |                      |                               |
| 002    | 0960_MW148S |             | 24/11/2021<br>08:18 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial<br>4/8              |             |                      | Extra PFAS bottles for lab QC |
| 003    | 0960_MW012  |             | 24/11/2021<br>09:15 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial<br>4/8              |             |                      |                               |
| 004    | 0960_QC115  |             | 24/11/2021<br>09:16 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial<br>1/8              |             |                      |                               |
| 005    | 0960_MW151  |             | 24/11/2021<br>09:17 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial<br>4/8              |             |                      |                               |
| 006    | 0960_MW105  |             | 24/11/2021<br>09:31 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial<br>4/8              |             |                      |                               |
| 007    | 0960_QC116  |             | 24/11/2021<br>09:34 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial<br>4/8              |             |                      |                               |
| 008    | 0060_OTH132 |             | 24/11/2021<br>10:38 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial<br>4/8              |             |                      |                               |
| 009    | 0960_OTH134 |             | 24/11/2021<br>10:59 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial<br>3/8              |             |                      |                               |



# CHAIN OF CUSTODY

COC#: 30608

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: MB\_DEF19009/Learmonth GW

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:

/ ES2019CARBSD0002

## LABORATORY USE ONLY (Circle)

Custody Seal intact?

Yes 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 | Ground Waters Primary WATER | Rinsate WATER | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION        |
|--------|--------------------|-------------|------------------------|--------|----------------------|---------|-----------------------------|---------------|----------------------|-------------------------------|
| 010    | 0960_MW175_5.5-6.0 |             | 24/11/2021<br>11:20 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial<br>4/8              |               |                      |                               |
| 011    | 0960_OTH129        |             | 24/11/2021<br>11:33 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial<br>4/8              |               |                      |                               |
| 012    | 0960_OTH103        |             | 24/11/2021<br>11:48 AM | Water  | ALS: 4<br>Non ALS: 0 | No      | Partial<br>4/8              |               |                      | Extra PFAS bottles for lab QC |
| 013    | 0960_MW177_3.5-4   |             | 24/11/2021<br>12:44 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial<br>4/8              |               |                      |                               |
| 014    | 0960_MW176_6-6.5   |             | 24/11/2021<br>01:55 PM | Water  | ALS: 5<br>Non ALS: 0 | No      | Partial<br>4/8              |               |                      | Extra PFAS bottles for lab QC |
| 015    | 0960_MW178_9-9.5   |             | 24/11/2021<br>02:11 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial<br>4/8              |               |                      |                               |
| 016    | 0960_MW135_6.4-7   |             | 24/11/2021<br>03:06 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial<br>4/8              |               |                      |                               |
| 017    | 0960_MW144_3-3.5   |             | 24/11/2021<br>03:24 PM | Water  | ALS: 5<br>Non ALS: 0 | No      | Partial<br>4/8              |               |                      | Extra PFAS bottles for lab QC |
| 018    | 0960_QC301         |             | 24/11/2021<br>04:42 PM | Water  | ALS: 2<br>Non ALS: 0 | No      |                             | X             |                      |                               |



# CHAIN OF CUSTODY

COC#: 30608

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: MB\_DEF19009/Learmonth GW

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:

/ ES2019CARBSD0002

## LABORATORY USE ONLY (Circle)

Custody Seal intact?

Yes 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 | Ground Waters Primary WATER | Rinsate WATER | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|------------|-------------|------------------------|--------|----------------------|---------|-----------------------------|---------------|----------------------|------------------------|
| 019    | 0960_QC302 |             | 24/11/2021<br>04:45 PM | Water  | ALS: 2<br>Non ALS: 0 | No      |                             | X             |                      |                        |
| 020    | 0960_QC303 |             | 24/11/2021<br>04:46 PM | Water  | ALS: 2<br>Non ALS: 0 | No      |                             | X             |                      |                        |
| 021    | 0960_QC401 |             | 24/11/2021<br>04:47 PM | Water  | ALS: 2<br>Non ALS: 0 | No      |                             | X             |                      |                        |
| 022    | 0960_QC402 |             | 24/11/2021<br>04:48 PM | Water  | ALS: 2<br>Non ALS: 0 | No      |                             | X             |                      |                        |
| 023    | 0960_QC403 |             | 24/11/2021<br>04:49 PM | Water  | ALS: 2<br>Non ALS: 0 | No      |                             | X             |                      |                        |





# CHAIN OF CUSTODY

COC#: 30608

ALS Laboratory: EP Perth

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: MB\_DEF19009/Learmonth GW

ORDER NO: DEF19009/0960

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

SAMPLER MOBILE:

/ ES2019CARBSD0002

## LABORATORY USE ONLY (Circle)

Custody Seal intact?

Yes 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    | 0960_MW148D        | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 002    | 0960_MW148S        | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 003    | 0960_MW012         | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 004    | 0960_QC115         | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 005    | 0960_MW151         | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 006    | 0960_MW105         | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 007    | 0960_QC116         | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 008    | 0060_OTH132        | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 009    | 0960_OTH134        | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 010    | 0960_MW175_5.5-6.0 | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |

**CHAIN OF CUSTODY**

COC#: 30608

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: MB\_DEF19009/Learmonth GW

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:

/ ES2019CARBSD0002

**LABORATORY USE ONLY (Circle)**

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

|     |                  |                             |       |                                                                                                                                                                                                             |
|-----|------------------|-----------------------------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 011 | 0960_OTH129      | Ground Waters Primary WATER | Water | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 012 | 0960_OTH103      | Ground Waters Primary WATER | Water | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 013 | 0960_MW177_3.5-4 | Ground Waters Primary WATER | Water | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 014 | 0960_MW176_6-6.5 | Ground Waters Primary WATER | Water | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 015 | 0960_MW178_9-9.5 | Ground Waters Primary WATER | Water | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 016 | 0960_MW135_6.4-7 | Ground Waters Primary WATER | Water | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 017 | 0960_MW144_3-3.5 | Ground Waters Primary WATER | Water | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |



# CHAIN OF CUSTODY

COC#: 30608

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: MB\_DEF19009/Learmonth GW

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:

/ ES2019CARBSD0002

## LABORATORY USE ONLY (Circle)

Custody Seal intact?

Yes 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    | 0960_MW148D | Clear Plastic Bottle - Natural | 250 mL | 00070621191118 | Green | No       |        |
| 001    | 0960_MW148D | HDPE (no PTFE)                 | 20 mL  | 00352101071358 | Grey  | No       |        |
| 001    | 0960_MW148D | HDPE (no PTFE)                 | 20 mL  | 00352101070905 | Grey  | No       |        |
| 001    | 0960_MW148D | HDPE (no PTFE)                 | 20 mL  | 00352101071138 | Grey  | No       |        |
| 001    | 0960_MW148D | HDPE (no PTFE)                 | 20 mL  | 00352101071149 | Grey  | No       |        |
| 002    | 0960_MW148S | Clear Plastic Bottle - Natural | 250 mL | 00070621191188 | Green | No       |        |
| 002    | 0960_MW148S | HDPE (no PTFE)                 | 20 mL  | 00352101071251 | Grey  | No       |        |
| 002    | 0960_MW148S | HDPE (no PTFE)                 | 20 mL  | 00352101071356 | Grey  | No       |        |
| 003    | 0960_MW012  | Clear Plastic Bottle - Natural | 250 mL | 00070621070549 | Green | No       |        |
| 003    | 0960_MW012  | HDPE (no PTFE)                 | 20 mL  | 00352101071678 | Grey  | No       |        |
| 003    | 0960_MW012  | HDPE (no PTFE)                 | 20 mL  | 00352101070785 | Grey  | No       |        |
| 004    | 0960_QC115  | Clear Plastic Bottle - Natural | 250 mL | 00070621197312 | Green | No       |        |
| 004    | 0960_QC115  | HDPE (no PTFE)                 | 20 mL  | 00352101071412 | Grey  | No       |        |
| 004    | 0960_QC115  | HDPE (no PTFE)                 | 20 mL  | 00352101071394 | Grey  | No       |        |
| 005    | 0960_MW151  | Clear Plastic Bottle - Natural | 250 mL | 00070621189972 | Green | No       |        |
| 005    | 0960_MW151  | HDPE (no PTFE)                 | 20 mL  | 00352101038045 | Grey  | No       |        |
| 005    | 0960_MW151  | HDPE (no PTFE)                 | 20 mL  | 00352101071991 | Grey  | No       |        |
| 006    | 0960_MW105  | Clear Plastic Bottle - Natural | 250 mL | 00070621070537 | Green | No       |        |
| 006    | 0960_MW105  | HDPE (no PTFE)                 | 20 mL  | 00352101070858 | Grey  | No       |        |
| 006    | 0960_MW105  | HDPE (no PTFE)                 | 20 mL  | 00352101071184 | Grey  | No       |        |
| 007    | 0960_QC116  | Clear Plastic Bottle - Natural | 250 mL | 00070621070587 | Green | No       |        |
| 007    | 0960_QC116  | HDPE (no PTFE)                 | 20 mL  | 00352101071473 | Grey  | No       |        |
| 007    | 0960_QC116  | HDPE (no PTFE)                 | 20 mL  | 00352101070875 | Grey  | No       |        |
| 008    | 0060_OTH132 | Clear Plastic Bottle - Natural | 250 mL | 00070621190148 | Green | No       |        |
| 008    | 0060_OTH132 | HDPE (no PTFE)                 | 20 mL  | 00352101070859 | Grey  | No       |        |
| 008    | 0060_OTH132 | HDPE (no PTFE)                 | 20 mL  | 00352101071529 | Grey  | No       |        |





# CHAIN OF CUSTODY

COC#: 30608

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: MB\_DEF19009/Learmonth GW

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:

/ ES2019CARBSD0002

## LABORATORY USE ONLY (Circle)

Custody Seal intact?

Yes No N/A

Free ice / frozen ice bricks present upon receipt?

Yes No N/A

Random Sample Temperature on Receipt:

°C

Other comments:

|     |                    |                                |        |                |       |    |  |
|-----|--------------------|--------------------------------|--------|----------------|-------|----|--|
| 009 | 0960_OTH134        | HDPE (no PTFE)                 | 20 mL  | 00352101071914 | Grey  | No |  |
| 009 | 0960_OTH134        | HDPE (no PTFE)                 | 20 mL  | 00352101071004 | Grey  | No |  |
| 009 | 0960_OTH134        | Clear Plastic Bottle - Natural | 250 mL | 00070621197246 | Green | No |  |
| 010 | 0960_MW175_5.5-6.0 | Clear Plastic Bottle - Natural | 250 mL | 00070621191275 | Green | No |  |
| 010 | 0960_MW175_5.5-6.0 | HDPE (no PTFE)                 | 20 mL  | 00352101071923 | Grey  | No |  |
| 010 | 0960_MW175_5.5-6.0 | HDPE (no PTFE)                 | 20 mL  | 00352101070936 | Grey  | No |  |
| 011 | 0960_OTH129        | Clear Plastic Bottle - Natural | 250 mL | 00070621052560 | Green | No |  |
| 011 | 0960_OTH129        | HDPE (no PTFE)                 | 20 mL  | 00352101071192 | Grey  | No |  |
| 011 | 0960_OTH129        | HDPE (no PTFE)                 | 20 mL  | 00352101071727 | Grey  | No |  |
| 012 | 0960_OTH103        | Clear Plastic Bottle - Natural | 250 mL | 00070621070557 | Green | No |  |
| 012 | 0960_OTH103        | HDPE (no PTFE)                 | 20 mL  | 00352101071075 | Grey  | No |  |
| 012 | 0960_OTH103        | HDPE (no PTFE)                 | 20 mL  | 00352101070891 | Grey  | No |  |
| 012 | 0960_OTH103        | HDPE (no PTFE)                 | 20 mL  | 00352101071788 | Grey  | No |  |
| 013 | 0960_MW177_3.5-4   | Clear Plastic Bottle - Natural | 250 mL | 00070621191283 | Green | No |  |
| 013 | 0960_MW177_3.5-4   | HDPE (no PTFE)                 | 20 mL  | 00352101071926 | Grey  | No |  |
| 013 | 0960_MW177_3.5-4   | HDPE (no PTFE)                 | 20 mL  | 00352101071700 | Grey  | No |  |
| 014 | 0960_MW176_6-6.5   | Clear Plastic Bottle - Natural | 250 mL | 00070621070581 | Green | No |  |
| 014 | 0960_MW176_6-6.5   | HDPE (no PTFE)                 | 20 mL  | 00352101070772 | Grey  | No |  |
| 014 | 0960_MW176_6-6.5   | HDPE (no PTFE)                 | 20 mL  | 00352101071424 | Grey  | No |  |
| 014 | 0960_MW176_6-6.5   | HDPE (no PTFE)                 | 20 mL  | 00352101071744 | Grey  | No |  |
| 014 | 0960_MW176_6-6.5   | HDPE (no PTFE)                 | 20 mL  | 00352101071304 | Grey  | No |  |
| 015 | 0960_MW178_9-9.5   | Clear Plastic Bottle - Natural | 250 mL | 00070621191135 | Green | No |  |
| 015 | 0960_MW178_9-9.5   | HDPE (no PTFE)                 | 20 mL  | 00352101071812 | Grey  | No |  |
| 015 | 0960_MW178_9-9.5   | HDPE (no PTFE)                 | 20 mL  | 00352101071347 | Grey  | No |  |
| 016 | 0960_MW135_6.4-7   | Clear Plastic Bottle - Natural | 250 mL | 00070621071175 | Green | No |  |
| 016 | 0960_MW135_6.4-7   | HDPE (no PTFE)                 | 20 mL  | 00352101071802 | Grey  | No |  |
| 016 | 0960_MW135_6.4-7   | HDPE (no PTFE)                 | 20 mL  | 00352101071024 | Grey  | No |  |



# CHAIN OF CUSTODY

COC#: 30608

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: MB\_DEF19009/Learmonth GW

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:

/ ES2019CARBSD0002

## LABORATORY USE ONLY (Circle)

Custody Seal intact?

Yes No N/A

Free ice / frozen ice bricks present upon receipt?

Yes No N/A

Random Sample Temperature on Receipt:

°C

Other comments:

|     |                  |                                |        |                |       |    |  |
|-----|------------------|--------------------------------|--------|----------------|-------|----|--|
| 017 | 0960_MW144_3-3.5 | Clear Plastic Bottle - Natural | 250 mL | 00070621191180 | Green | No |  |
| 017 | 0960_MW144_3-3.5 | HDPE (no PTFE)                 | 20 mL  | 00352101070793 | Grey  | No |  |
| 017 | 0960_MW144_3-3.5 | HDPE (no PTFE)                 | 20 mL  | 0035210107892  | Grey  | No |  |
| 017 | 0960_MW144_3-3.5 | HDPE (no PTFE)                 | 20 mL  | 00352101071044 | Grey  | No |  |
| 017 | 0960_MW144_3-3.5 | HDPE (no PTFE)                 | 20 mL  | 00352101070885 | Grey  | No |  |
| 018 | 0960_QC301       | HDPE (no PTFE)                 | 20 mL  | 00350019177568 | Grey  | No |  |
| 018 | 0960_QC301       | HDPE (no PTFE)                 | 20 mL  | 00350019041963 | Grey  | No |  |
| 019 | 0960_QC302       | HDPE (no PTFE)                 | 20 mL  | 00352010058993 | Grey  | No |  |
| 019 | 0960_QC302       | HDPE (no PTFE)                 | 20 mL  | 00350019177527 | Grey  | No |  |
| 020 | 0960_QC303       | HDPE (no PTFE)                 | 20 mL  | 00350019177322 | Grey  | No |  |
| 020 | 0960_QC303       | HDPE (no PTFE)                 | 20 mL  | 00352010059120 | Grey  | No |  |
| 021 | 0960_QC401       | HDPE (no PTFE)                 | 20 mL  | 00350019177578 | Grey  | No |  |
| 021 | 0960_QC401       | HDPE (no PTFE)                 | 20 mL  | 00350019177525 | Grey  | No |  |
| 022 | 0960_QC402       | HDPE (no PTFE)                 | 20 mL  | 00350019177404 | Grey  | No |  |
| 022 | 0960_QC402       | HDPE (no PTFE)                 | 20 mL  | 00350019177595 | Grey  | No |  |
| 023 | 0960_QC403       | HDPE (no PTFE)                 | 20 mL  | 00350019177569 | Grey  | No |  |
| 023 | 0960_QC403       | HDPE (no PTFE)                 | 20 mL  | 00350019035078 | Grey  | No |  |

Total Bottle Count: ALS: 70, Non ALS: 0

## SAMPLE RECEIPT NOTIFICATION (SRN)

**Work Order : EP2114392**

|                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Client : <b>CARDNO (WA) PTY LTD</b></p> <p>Contact : [REDACTED]</p> <p>Address : 11 HARVEST TERRACE PO BOX 155<br/>WEST PERTH WA, AUSTRALIA 6006</p> <p>E-mail : [REDACTED]@cardno.com.au</p> <p>Telephone : ----</p> <p>Facsimile : ----</p> <p>Project : WA_0960_PFASOMP</p> <p>Order number : DEF19009/0960</p> <p>C-O-C number : 30608</p> <p>Site : DEF19009/Learmonth</p> <p>Sampler : [REDACTED]</p> | <p>Laboratory : Environmental Division Perth</p> <p>Contact : Customer Services EP</p> <p>Address : 26 Rigali Way Wangara WA Australia<br/>6065</p> <p>E-mail : ALSEnviro.Perth@alsglobal.com</p> <p>Telephone : +61-8-9406 1301</p> <p>Facsimile : +61-8-9406 1399</p> <p>Page : 1 of 3</p> <p>Quote number : ES2019CARBSD0002 (SY/139/19)</p> <p>QC Level : NEPM 2013 B3 &amp; ALS QC Standard</p> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Dates

|                                           |                                               |
|-------------------------------------------|-----------------------------------------------|
| Date Samples Received : 26-Nov-2021 09:55 | Issue Date : 29-Nov-2021                      |
| Client Requested Due Date : 08-Dec-2021   | Scheduled Reporting Date : <b>08-Dec-2021</b> |

### Delivery Details

|                            |                                              |
|----------------------------|----------------------------------------------|
| Mode of Delivery : Carrier | Security Seal : Not Available                |
| No. of coolers/boxes : 3   | Temperature : 24.8 - Ice present             |
| Receipt Detail :           | No. of samples received / analysed : 23 / 23 |

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





## Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exists.

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

EP2114392-010 : 24-Nov-2021 11:20 : 0960\_MW175\_5.5-6.0\_211124  
EP2114392-013 : 24-Nov-2021 12:44 : 0960\_MW177\_3.5-4\_211124  
EP2114392-014 : 24-Nov-2021 13:55 : 0960\_MW176\_6-6.5\_211124  
EP2114392-015 : 24-Nov-2021 14:11 : 0960\_MW178\_9-9.5\_211124  
EP2114392-016 : 24-Nov-2021 15:06 : 0960\_MW135\_6.4-7\_211124  
EP2114392-017 : 24-Nov-2021 15:24 : 0960\_MW144\_3-3.5\_211124

## 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 - EN055 - PG<br>Ionic Balance by ED037P, ED041G, ED045G &<br>WATER - EP231X<br>PFAS - Full Suite (28 analytes) | WATER - NT-01<br>Major Cations (Ca, Mg, Na, K) | WATER - NT-02<br>Major Anions (Chloride, Sulphate, Alkalinity) |
|----------------------|----------------------|-------------------------|----------------------------------------------------------------------------------------------------------------------|------------------------------------------------|----------------------------------------------------------------|
| EP2114392-001        | 24-Nov-2021 08:17    | 0960_MW148D_211124      | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114392-002        | 24-Nov-2021 08:18    | 0960_MW148S_211124      | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114392-003        | 24-Nov-2021 09:15    | 0960_MW012_211124       | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114392-004        | 24-Nov-2021 09:16    | 0960_QC115_211124       |                                                                                                                      | ✓                                              |                                                                |
| EP2114392-005        | 24-Nov-2021 09:17    | 0960_MW151_211124       | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114392-006        | 24-Nov-2021 09:31    | 0960_MW105_211124       | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114392-007        | 24-Nov-2021 09:34    | 0960_QC116_211124       | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114392-008        | 24-Nov-2021 10:38    | 0060_OTH132_211124      | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114392-009        | 24-Nov-2021 10:59    | 0960_OTH134_211124      | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114392-010        | 24-Nov-2021 11:20    | 0960_MW175_5.5-6.0_2... | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114392-011        | 24-Nov-2021 11:33    | 0960_OTH129_211124      | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114392-012        | 24-Nov-2021 11:48    | 0960_OTH103_211124      | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114392-013        | 24-Nov-2021 12:44    | 0960_MW177_3.5-4_211... | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114392-014        | 24-Nov-2021 13:55    | 0960_MW176_6-6.5_211... | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114392-015        | 24-Nov-2021 14:11    | 0960_MW178_9-9.5_211... | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114392-016        | 24-Nov-2021 15:06    | 0960_MW135_6.4-7_211... | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114392-017        | 24-Nov-2021 15:24    | 0960_MW144_3-3.5_211... | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114392-018        | 24-Nov-2021 16:42    | 0960_QC301_211124       |                                                                                                                      | ✓                                              |                                                                |
| EP2114392-019        | 24-Nov-2021 16:45    | 0960_QC302_211124       |                                                                                                                      | ✓                                              |                                                                |
| EP2114392-020        | 24-Nov-2021 16:46    | 0960_QC303_211124       |                                                                                                                      | ✓                                              |                                                                |
| EP2114392-021        | 24-Nov-2021 16:47    | 0960_QC401_211124       |                                                                                                                      | ✓                                              |                                                                |
| EP2114392-022        | 24-Nov-2021 16:48    | 0960_QC402_211124       |                                                                                                                      | ✓                                              |                                                                |
| EP2114392-023        | 24-Nov-2021 16:49    | 0960_QC403_211124       |                                                                                                                      | ✓                                              |                                                                |

## Proactive Holding Time Report

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



### Requested Deliverables

[REDACTED] [REDACTED]

- A4 - AU Tax Invoice (INV)

Email [REDACTED]@cardno.com.au

#### DERP LAB REPORTS

- EDI Format - ESDAT (ESDAT)

Email derp.labreports@esdat.com.au

[REDACTED] [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 - ESDAT (ESDAT)
- EDI Format - XTab (XTAB)

Email [REDACTED]@cardno.com.au  
Email [REDACTED]@cardno.com.au  
Email [REDACTED]@cardno.com.au  
Email [REDACTED]@cardno.com.au  
Email [REDACTED]@cardno.com.au  
Email [REDACTED]@cardno.com.au  
Email [REDACTED]@cardno.com.au

#### Perth

- A4 - AU Tax Invoice (INV)

Email perth@cardno.com.au

## CERTIFICATE OF ANALYSIS

**Work Order** : EP2114392  
**Client** : CARDNO (WA) PTY LTD  
**Contact** : [REDACTED]  
**Address** : 11 HARVEST TERRACE PO BOX 155  
 WEST PERTH WA, AUSTRALIA 6006  
**Telephone** : ----  
**Project** : WA\_0960\_PFASOMP  
**Order number** : DEF19009/0960  
**C-O-C number** : 30608  
**Sampler** : [REDACTED]  
**Site** : DEF19009/Learmonth  
**Quote number** : SY/139/19  
**No. of samples received** : 23  
**No. of samples analysed** : 23

**Page** : 1 of 19  
**Laboratory** : Environmental Division Perth  
**Contact** : Customer Services EP  
**Address** : 26 Rigali Way Wangara WA Australia 6065  
**Telephone** : +61-8-9406 1301  
**Date Samples Received** : 26-Nov-2021 09:55  
**Date Analysis Commenced** : 30-Nov-2021  
**Issue Date** : 07-Dec-2021 17:34



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           |
|------------------------------------------------------------------------|----------------------------|----------------------------------|
| <span style="background-color: black; color: black;">[REDACTED]</span> | Laboratory Manager (Perth) | Perth Inorganics, Wangara, WA    |
| <span style="background-color: black; color: black;">[REDACTED]</span> | Metals Chemist             | Perth Inorganics, Wangara, WA    |
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator           | Sydney Organics, Smithfield, NSW |





## 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.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- 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.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, 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: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                                   |             |      |       | 0960_MW148D_21112<br>4 | 0960_MW148S_21112<br>4 | 0960_MW012_211124 | 0960_QC115_211124 | 0960_MW151_211124 |
|-------------------------------------------------------------------|-------------|------|-------|------------------------|------------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                              |             |      |       | 24-Nov-2021 08:17      | 24-Nov-2021 08:18      | 24-Nov-2021 09:15 | 24-Nov-2021 09:16 | 24-Nov-2021 09:17 |
| Compound                                                          | CAS Number  | LOR  | Unit  | EP2114392-001          | EP2114392-002          | EP2114392-003     | EP2114392-004     | EP2114392-005     |
|                                                                   |             |      |       | Result                 | Result                 | Result            | Result            | Result            |
| <b>ED037P: Alkalinity by PC Titrator</b>                          |             |      |       |                        |                        |                   |                   |                   |
| Hydroxide Alkalinity as CaCO <sub>3</sub>                         | DMO-210-001 | 1    | mg/L  | <1                     | <1                     | <1                | ----              | <1                |
| Carbonate Alkalinity as CaCO <sub>3</sub>                         | 3812-32-6   | 1    | mg/L  | <1                     | <1                     | <1                | ----              | <1                |
| Bicarbonate Alkalinity as CaCO <sub>3</sub>                       | 71-52-3     | 1    | mg/L  | 196                    | 385                    | 763               | ----              | 708               |
| Total Alkalinity as CaCO <sub>3</sub>                             | ----        | 1    | mg/L  | 196                    | 385                    | 763               | ----              | 708               |
| <b>ED041G: Sulfate (Turbidimetric) as SO<sub>4</sub> 2- by DA</b> |             |      |       |                        |                        |                   |                   |                   |
| Sulfate as SO <sub>4</sub> - Turbidimetric                        | 14808-79-8  | 1    | mg/L  | 3550                   | 2000                   | 837               | ----              | 657               |
| <b>ED045G: Chloride by Discrete Analyser</b>                      |             |      |       |                        |                        |                   |                   |                   |
| Chloride                                                          | 16887-00-6  | 1    | mg/L  | 28400                  | 15100                  | 1370              | ----              | 4610              |
| <b>ED093F: Dissolved Major Cations</b>                            |             |      |       |                        |                        |                   |                   |                   |
| Calcium                                                           | 7440-70-2   | 1    | mg/L  | 944                    | 596                    | 20                | ----              | 161               |
| Magnesium                                                         | 7439-95-4   | 1    | mg/L  | 1920                   | 1070                   | 43                | ----              | 279               |
| Sodium                                                            | 7440-23-5   | 1    | mg/L  | 17900                  | 9420                   | 1290              | ----              | 2730              |
| Potassium                                                         | 7440-09-7   | 1    | mg/L  | 781                    | 384                    | 60                | ----              | 145               |
| <b>EN055: Ionic Balance</b>                                       |             |      |       |                        |                        |                   |                   |                   |
| ∅ Total Anions                                                    | ----        | 0.01 | meq/L | 879                    | 475                    | 71.3              | ----              | 158               |
| ∅ Total Cations                                                   | ----        | 0.01 | meq/L | 1000                   | 537                    | 62.2              | ----              | 153               |
| ∅ Ionic Balance                                                   | ----        | 0.01 | %     | 6.63                   | 6.13                   | 6.84              | ----              | 1.42              |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>                      |             |      |       |                        |                        |                   |                   |                   |
| Perfluorobutane sulfonic acid (PFBS)                              | 375-73-5    | 0.02 | µg/L  | 1.49                   | 15.2                   | 8.41              | 8.71              | 3.72              |
| Perfluoropentane sulfonic acid (PFPeS)                            | 2706-91-4   | 0.02 | µg/L  | 0.99                   | 11.1                   | 6.92              | 6.95              | 4.14              |
| Perfluorohexane sulfonic acid (PFHxS)                             | 355-46-4    | 0.01 | µg/L  | 4.07                   | 45.2                   | 44.8              | 49.3              | 35.3              |
| Perfluoroheptane sulfonic acid (PFHpS)                            | 375-92-8    | 0.02 | µg/L  | 0.28                   | 3.32                   | 4.24              | 4.35              | 3.41              |
| Perfluorooctane sulfonic acid (PFOS)                              | 1763-23-1   | 0.01 | µg/L  | 2.56                   | 33.1                   | 42.9              | 52.8              | 29.4              |
| Perfluorodecane sulfonic acid (PFDS)                              | 335-77-3    | 0.02 | µg/L  | <0.02                  | <0.02                  | <0.02             | <0.02             | <0.02             |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>                    |             |      |       |                        |                        |                   |                   |                   |
| Perfluorobutanoic acid (PFBA)                                     | 375-22-4    | 0.1  | µg/L  | 0.2                    | 2.4                    | 4.7               | 4.8               | 1.0               |
| Perfluoropentanoic acid (PFPeA)                                   | 2706-90-3   | 0.02 | µg/L  | 0.34                   | 3.54                   | 13.0              | 13.1              | 2.02              |
| Perfluorohexanoic acid (PFHxA)                                    | 307-24-4    | 0.02 | µg/L  | 1.95                   | 18.3                   | 51.6              | 56.7              | 12.8              |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_MW148D_21112<br>4 | 0960_MW148S_21112<br>4 | 0960_MW012_211124 | 0960_QC115_211124 | 0960_MW151_211124 |
|------------------------------------------------------------|-------------|------|------|------------------------|------------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                       |             |      |      | 24-Nov-2021 08:17      | 24-Nov-2021 08:18      | 24-Nov-2021 09:15 | 24-Nov-2021 09:16 | 24-Nov-2021 09:17 |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2114392-001          | EP2114392-002          | EP2114392-003     | EP2114392-004     | EP2114392-005     |
|                                                            |             |      |      | Result                 | Result                 | Result            | Result            | Result            |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                        |                        |                   |                   |                   |
| Perfluoroheptanoic acid (PFHpA)                            | 375-85-9    | 0.02 | µg/L | 0.17                   | 1.90                   | 3.88              | 4.03              | 0.92              |
| Perfluorooctanoic acid (PFOA)                              | 335-67-1    | 0.01 | µg/L | 0.25                   | 2.73                   | 4.42              | 4.65              | 2.45              |
| Perfluorononanoic acid (PFNA)                              | 375-95-1    | 0.02 | µg/L | <0.02                  | <0.02                  | 0.04              | 0.04              | <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             |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                        |                        |                   |                   |                   |
| Perfluorooctane sulfonamide (FOSA)                         | 754-91-6    | 0.02 | µg/L | <0.02                  | <0.02                  | 0.06              | 0.07              | <0.02             |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)              | 31506-32-8  | 0.05 | µg/L | <0.05                  | <0.05                  | <0.05             | <0.05             | <0.05             |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)               | 4151-50-2   | 0.05 | µg/L | <0.05                  | <0.05                  | <0.05             | <0.05             | <0.05             |
| N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)       | 24448-09-7  | 0.05 | µg/L | <0.05                  | <0.05                  | <0.05             | <0.05             | <0.05             |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)        | 1691-99-2   | 0.05 | µg/L | <0.05                  | <0.05                  | <0.05             | <0.05             | <0.05             |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)  | 2355-31-9   | 0.02 | µg/L | <0.02                  | <0.02                  | <0.02             | <0.02             | <0.02             |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)   | 2991-50-6   | 0.02 | µg/L | <0.02                  | <0.02                  | <0.02             | <0.02             | <0.02             |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                        |                        |                   |                   |                   |
| 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                  | 0.18              | 0.18              | <0.05             |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                  | 39108-34-4  | 0.05 | µg/L | <0.05                  | <0.05                  | 0.08              | 0.09              | <0.05             |





## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_MW148D_21112<br>4 | 0960_MW148S_21112<br>4 | 0960_MW012_211124 | 0960_QC115_211124 | 0960_MW151_211124 |
|---------------------------------------------------------------|--------------------|------|------|------------------------|------------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                          |                    |      |      | 24-Nov-2021 08:17      | 24-Nov-2021 08:18      | 24-Nov-2021 09:15 | 24-Nov-2021 09:16 | 24-Nov-2021 09:17 |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2114392-001          | EP2114392-002          | EP2114392-003     | EP2114392-004     | EP2114392-005     |
|                                                               |                    |      |      | Result                 | Result                 | Result            | Result            | Result            |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                        |                        |                   |                   |                   |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05                  | <0.05                  | <0.05             | <0.05             | <0.05             |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                        |                        |                   |                   |                   |
| Sum of PFAS                                                   | ----               | 0.01 | µg/L | 12.3                   | 137                    | 185               | 206               | 95.2              |
| Sum of PFHxS and PFOS                                         | 355-46-4/1763-23-1 | 0.01 | µg/L | 6.63                   | 78.3                   | 87.7              | 102               | 64.7              |
| Sum of PFAS (WA DER List)                                     | ----               | 0.01 | µg/L | 11.0                   | 122                    | 174               | 194               | 87.6              |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                        |                        |                   |                   |                   |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 105                    | 102                    | 92.3              | 98.1              | 112               |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 74.6                   | 72.4                   | 66.1              | 61.9              | 75.2              |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                        |             |      |       | 0960_MW105_211124 | 0960_QC116_211124 | 0960_MW175_5.5-6.0_211124 | 0960_MW177_3.5-4_211124 | 0960_MW176_6-6.5_211124 |
|--------------------------------------------------------|-------------|------|-------|-------------------|-------------------|---------------------------|-------------------------|-------------------------|
| Sampling date / time                                   |             |      |       | 24-Nov-2021 09:31 | 24-Nov-2021 09:34 | 24-Nov-2021 11:20         | 24-Nov-2021 12:44       | 24-Nov-2021 13:55       |
| Compound                                               | CAS Number  | LOR  | Unit  | EP2114392-006     | EP2114392-007     | EP2114392-010             | EP2114392-013           | EP2114392-014           |
|                                                        |             |      |       | Result            | Result            | Result                    | Result                  | Result                  |
| <b>ED037P: Alkalinity by PC Titrator</b>               |             |      |       |                   |                   |                           |                         |                         |
| Hydroxide Alkalinity as CaCO3                          | DMO-210-001 | 1    | mg/L  | <1                | <1                | <1                        | <1                      | <1                      |
| Carbonate Alkalinity as CaCO3                          | 3812-32-6   | 1    | mg/L  | <1                | <1                | <1                        | <1                      | <1                      |
| Bicarbonate Alkalinity as CaCO3                        | 71-52-3     | 1    | mg/L  | 358               | 371               | 429                       | 136                     | 140                     |
| Total Alkalinity as CaCO3                              | ----        | 1    | mg/L  | 358               | 371               | 429                       | 136                     | 140                     |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b> |             |      |       |                   |                   |                           |                         |                         |
| Sulfate as SO4 - Turbidimetric                         | 14808-79-8  | 1    | mg/L  | 1470              | 1480              | 108                       | 4900                    | 3460                    |
| <b>ED045G: Chloride by Discrete Analyser</b>           |             |      |       |                   |                   |                           |                         |                         |
| Chloride                                               | 16887-00-6  | 1    | mg/L  | 14300             | 14600             | 1140                      | 34600                   | 23600                   |
| <b>ED093F: Dissolved Major Cations</b>                 |             |      |       |                   |                   |                           |                         |                         |
| Calcium                                                | 7440-70-2   | 1    | mg/L  | 604               | 602               | 70                        | 838                     | 691                     |
| Magnesium                                              | 7439-95-4   | 1    | mg/L  | 1190              | 1190              | 180                       | 2640                    | 1740                    |
| Sodium                                                 | 7440-23-5   | 1    | mg/L  | 8480              | 8550              | 478                       | 21600                   | 14100                   |
| Potassium                                              | 7440-09-7   | 1    | mg/L  | 427               | 425               | 35                        | 995                     | 787                     |
| <b>EN055: Ionic Balance</b>                            |             |      |       |                   |                   |                           |                         |                         |
| ∅ Total Anions                                         | ----        | 0.01 | meq/L | 441               | 450               | 43.0                      | 1080                    | 740                     |
| ∅ Total Cations                                        | ----        | 0.01 | meq/L | 508               | 511               | 40.0                      | 1220                    | 811                     |
| ∅ Ionic Balance                                        | ----        | 0.01 | %     | 7.03              | 6.32              | 3.60                      | 6.22                    | 4.55                    |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>           |             |      |       |                   |                   |                           |                         |                         |
| Perfluorobutane sulfonic acid (PFBS)                   | 375-73-5    | 0.02 | µg/L  | 0.18              | 0.29              | <0.02                     | <0.02                   | <0.02                   |
| Perfluoropentane sulfonic acid (PFPeS)                 | 2706-91-4   | 0.02 | µg/L  | 0.18              | 0.31              | <0.02                     | <0.02                   | <0.02                   |
| Perfluorohexane sulfonic acid (PFHxS)                  | 355-46-4    | 0.01 | µg/L  | 0.95              | 1.70              | <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  | 0.04              | 0.06              | <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                   |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>         |             |      |       |                   |                   |                           |                         |                         |
| 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              | 0.05              | <0.02                     | <0.02                   | <0.02                   |
| Perfluorohexanoic acid (PFHxA)                         | 307-24-4    | 0.02 | µg/L  | 0.20              | 0.33              | <0.02                     | 0.02                    | 0.04                    |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_MW105_211124 | 0960_QC116_211124 | 0960_MW175_5.5-6.0_211124 | 0960_MW177_3.5-4_211124 | 0960_MW176_6-6.5_211124 |
|------------------------------------------------------------|-------------|------|------|-------------------|-------------------|---------------------------|-------------------------|-------------------------|
| Sampling date / time                                       |             |      |      | 24-Nov-2021 09:31 | 24-Nov-2021 09:34 | 24-Nov-2021 11:20         | 24-Nov-2021 12:44       | 24-Nov-2021 13:55       |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2114392-006     | EP2114392-007     | EP2114392-010             | EP2114392-013           | EP2114392-014           |
|                                                            |             |      |      | Result            | Result            | Result                    | Result                  | Result                  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                   |                   |                           |                         |                         |
| Perfluoroheptanoic acid (PFHpA)                            | 375-85-9    | 0.02 | µg/L | <0.02             | <0.02             | <0.02                     | 0.15                    | 0.21                    |
| 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 (PFTTrDA)                        | 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                   |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                   |                   |                           |                         |                         |
| Perfluorooctane sulfonamide (FOSA)                         | 754-91-6    | 0.02 | µg/L | <0.02             | <0.02             | <0.02                     | <0.02                   | <0.02                   |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)              | 31506-32-8  | 0.05 | µg/L | <0.05             | <0.05             | <0.05                     | <0.05                   | <0.05                   |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)               | 4151-50-2   | 0.05 | µg/L | <0.05             | <0.05             | <0.05                     | <0.05                   | <0.05                   |
| N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)       | 24448-09-7  | 0.05 | µg/L | <0.05             | <0.05             | <0.05                     | <0.05                   | <0.05                   |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)        | 1691-99-2   | 0.05 | µg/L | <0.05             | <0.05             | <0.05                     | <0.05                   | <0.05                   |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)  | 2355-31-9   | 0.02 | µg/L | <0.02             | <0.02             | <0.02                     | <0.02                   | <0.02                   |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)   | 2991-50-6   | 0.02 | µg/L | <0.02             | <0.02             | <0.02                     | <0.02                   | <0.02                   |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                   |                   |                           |                         |                         |
| 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                   |





## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_MW105_211124 | 0960_QC116_211124 | 0960_MW175_5.5-6.0_211124 | 0960_MW177_3.5-4_211124 | 0960_MW176_6-6.5_211124 |
|---------------------------------------------------------------|--------------------|------|------|-------------------|-------------------|---------------------------|-------------------------|-------------------------|
| Sampling date / time                                          |                    |      |      | 24-Nov-2021 09:31 | 24-Nov-2021 09:34 | 24-Nov-2021 11:20         | 24-Nov-2021 12:44       | 24-Nov-2021 13:55       |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2114392-006     | EP2114392-007     | EP2114392-010             | EP2114392-013           | EP2114392-014           |
|                                                               |                    |      |      | Result            | Result            | Result                    | Result                  | Result                  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                   |                   |                           |                         |                         |
| 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                   |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                   |                   |                           |                         |                         |
| Sum of PFAS                                                   | ----               | 0.01 | µg/L | 1.59              | 2.76              | <0.01                     | 0.18                    | 0.26                    |
| Sum of PFHxS and PFOS                                         | 355-46-4/1763-23-1 | 0.01 | µg/L | 0.99              | 1.76              | <0.01                     | 0.01                    | 0.01                    |
| Sum of PFAS (WA DER List)                                     | ----               | 0.01 | µg/L | 1.41              | 2.45              | <0.01                     | 0.18                    | 0.26                    |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                   |                   |                           |                         |                         |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 104               | 102               | 109                       | 109                     | 112                     |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 72.1              | 111               | 80.5                      | 78.6                    | 75.6                    |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                        |             |      |       | 0960_MW178_9-9.5_2<br>11124 | 0960_MW135_6.4-7_2<br>11124 | 0960_MW144_3-3.5_2<br>11124 | ----  | ----  |
|--------------------------------------------------------|-------------|------|-------|-----------------------------|-----------------------------|-----------------------------|-------|-------|
| Sampling date / time                                   |             |      |       | 24-Nov-2021 14:11           | 24-Nov-2021 15:06           | 24-Nov-2021 15:24           | ----  | ----  |
| Compound                                               | CAS Number  | LOR  | Unit  | EP2114392-015               | EP2114392-016               | EP2114392-017               | ----- | ----- |
|                                                        |             |      |       | Result                      | Result                      | Result                      | ----  | ----  |
| <b>ED037P: Alkalinity by PC Titrator</b>               |             |      |       |                             |                             |                             |       |       |
| Hydroxide Alkalinity as CaCO3                          | DMO-210-001 | 1    | mg/L  | <1                          | <1                          | <1                          | ----  | ----  |
| Carbonate Alkalinity as CaCO3                          | 3812-32-6   | 1    | mg/L  | <1                          | <1                          | <1                          | ----  | ----  |
| Bicarbonate Alkalinity as CaCO3                        | 71-52-3     | 1    | mg/L  | 128                         | 247                         | 184                         | ----  | ----  |
| Total Alkalinity as CaCO3                              | ----        | 1    | mg/L  | 128                         | 247                         | 184                         | ----  | ----  |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b> |             |      |       |                             |                             |                             |       |       |
| Sulfate as SO4 - Turbidimetric                         | 14808-79-8  | 1    | mg/L  | 5080                        | 1550                        | 3030                        | ----  | ----  |
| <b>ED045G: Chloride by Discrete Analyser</b>           |             |      |       |                             |                             |                             |       |       |
| Chloride                                               | 16887-00-6  | 1    | mg/L  | 33500                       | 11100                       | 11200                       | ----  | ----  |
| <b>ED093F: Dissolved Major Cations</b>                 |             |      |       |                             |                             |                             |       |       |
| Calcium                                                | 7440-70-2   | 1    | mg/L  | 1140                        | 376                         | 767                         | ----  | ----  |
| Magnesium                                              | 7439-95-4   | 1    | mg/L  | 2620                        | 828                         | 887                         | ----  | ----  |
| Sodium                                                 | 7440-23-5   | 1    | mg/L  | 21600                       | 6160                        | 6630                        | ----  | ----  |
| Potassium                                              | 7440-09-7   | 1    | mg/L  | 996                         | 315                         | 393                         | ----  | ----  |
| <b>EN055: Ionic Balance</b>                            |             |      |       |                             |                             |                             |       |       |
| ∅ Total Anions                                         | ----        | 0.01 | meq/L | 1050                        | 350                         | 383                         | ----  | ----  |
| ∅ Total Cations                                        | ----        | 0.01 | meq/L | 1240                        | 363                         | 410                         | ----  | ----  |
| ∅ Ionic Balance                                        | ----        | 0.01 | %     | 8.04                        | 1.76                        | 3.41                        | ----  | ----  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>           |             |      |       |                             |                             |                             |       |       |
| 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                       | 0.11                        | <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                       | 0.09                        | <0.01                       | ----  | ----  |
| Perfluorodecane sulfonic acid (PFDS)                   | 335-77-3    | 0.02 | µg/L  | <0.02                       | <0.02                       | <0.02                       | ----  | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>         |             |      |       |                             |                             |                             |       |       |
| 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  | 0.04                        | 0.12                        | <0.02                       | ----  | ----  |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_MW178_9-9.5_2<br>11124 | 0960_MW135_6.4-7_2<br>11124 | 0960_MW144_3-3.5_2<br>11124 | ----  | ----  |
|------------------------------------------------------------|-------------|------|------|-----------------------------|-----------------------------|-----------------------------|-------|-------|
| Sampling date / time                                       |             |      |      | 24-Nov-2021 14:11           | 24-Nov-2021 15:06           | 24-Nov-2021 15:24           | ----  | ----  |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2114392-015               | EP2114392-016               | EP2114392-017               | ----- | ----- |
|                                                            |             |      |      | Result                      | Result                      | Result                      | ----  | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                             |                             |                             |       |       |
| Perfluoroheptanoic acid (PFHpA)                            | 375-85-9    | 0.02 | µg/L | 0.29                        | <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                       | ----  | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                             |                             |                             |       |       |
| 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                       | ----  | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                             |                             |                             |       |       |
| 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                       | ----  | ----  |





## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_MW178_9-9.5_2<br>11124 | 0960_MW135_6.4-7_2<br>11124 | 0960_MW144_3-3.5_2<br>11124 | ----  | ----  |
|---------------------------------------------------------------|--------------------|------|------|-----------------------------|-----------------------------|-----------------------------|-------|-------|
| Sampling date / time                                          |                    |      |      | 24-Nov-2021 14:11           | 24-Nov-2021 15:06           | 24-Nov-2021 15:24           | ----  | ----  |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2114392-015               | EP2114392-016               | EP2114392-017               | ----- | ----- |
|                                                               |                    |      |      | Result                      | Result                      | Result                      | ----  | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                             |                             |                             |       |       |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05                       | <0.05                       | <0.05                       | ----  | ----  |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                             |                             |                             |       |       |
| Sum of PFAS                                                   | ----               | 0.01 | µg/L | <b>0.33</b>                 | <b>0.36</b>                 | <0.01                       | ----  | ----  |
| Sum of PFHxS and PFOS                                         | 355-46-4/1763-23-1 | 0.01 | µg/L | <0.01                       | <b>0.20</b>                 | <0.01                       | ----  | ----  |
| Sum of PFAS (WA DER List)                                     | ----               | 0.01 | µg/L | <b>0.33</b>                 | <b>0.36</b>                 | <0.01                       | ----  | ----  |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                             |                             |                             |       |       |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | <b>111</b>                  | <b>110</b>                  | <b>111</b>                  | ----  | ----  |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | <b>80.4</b>                 | <b>82.5</b>                 | <b>80.0</b>                 | ----  | ----  |



## Analytical Results

Sub-Matrix: MARINE WATER  
 (Matrix: WATER)

Sample ID

|                                                        |             |      |       | 0060_OTH132_21112<br>4 | 0960_OTH134_21112<br>4 | 0960_OTH129_21112<br>4 | 0960_OTH103_21112<br>4 | ----  |
|--------------------------------------------------------|-------------|------|-------|------------------------|------------------------|------------------------|------------------------|-------|
| Sampling date / time                                   |             |      |       | 24-Nov-2021 10:38      | 24-Nov-2021 10:59      | 24-Nov-2021 11:33      | 24-Nov-2021 11:48      | ----  |
| Compound                                               | CAS Number  | LOR  | Unit  | EP2114392-008          | EP2114392-009          | EP2114392-011          | EP2114392-012          | ----- |
|                                                        |             |      |       | Result                 | Result                 | Result                 | Result                 | ----  |
| <b>ED037P: Alkalinity by PC Titrator</b>               |             |      |       |                        |                        |                        |                        |       |
| Hydroxide Alkalinity as CaCO3                          | DMO-210-001 | 1    | mg/L  | <1                     | <1                     | <1                     | <1                     | ----  |
| Carbonate Alkalinity as CaCO3                          | 3812-32-6   | 1    | mg/L  | <1                     | <1                     | <1                     | 4                      | ----  |
| Bicarbonate Alkalinity as CaCO3                        | 71-52-3     | 1    | mg/L  | 134                    | 193                    | 124                    | 121                    | ----  |
| Total Alkalinity as CaCO3                              | ----        | 1    | mg/L  | 134                    | 193                    | 124                    | 125                    | ----  |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b> |             |      |       |                        |                        |                        |                        |       |
| Sulfate as SO4 - Turbidimetric                         | 14808-79-8  | 1    | mg/L  | 2630                   | 2840                   | 2740                   | 2560                   | ----  |
| <b>ED045G: Chloride by Discrete Analyser</b>           |             |      |       |                        |                        |                        |                        |       |
| Chloride                                               | 16887-00-6  | 1    | mg/L  | 19600                  | 20400                  | 19900                  | 18900                  | ----  |
| <b>ED093F: Dissolved Major Cations</b>                 |             |      |       |                        |                        |                        |                        |       |
| Calcium                                                | 7440-70-2   | 1    | mg/L  | 479                    | 492                    | 485                    | 468                    | ----  |
| Magnesium                                              | 7439-95-4   | 1    | mg/L  | 1510                   | 1480                   | 1540                   | 1480                   | ----  |
| Sodium                                                 | 7440-23-5   | 1    | mg/L  | 11700                  | 11500                  | 12000                  | 11400                  | ----  |
| Potassium                                              | 7440-09-7   | 1    | mg/L  | 606                    | 594                    | 620                    | 596                    | ----  |
| <b>EN055: Ionic Balance</b>                            |             |      |       |                        |                        |                        |                        |       |
| ∅ Total Anions                                         | ----        | 0.01 | meq/L | 610                    | 638                    | 621                    | 589                    | ----  |
| ∅ Total Cations                                        | ----        | 0.01 | meq/L | 672                    | 662                    | 689                    | 656                    | ----  |
| ∅ Ionic Balance                                        | ----        | 0.01 | %     | 4.85                   | 1.79                   | 5.18                   | 5.41                   | ----  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>           |             |      |       |                        |                        |                        |                        |       |
| Perfluorobutane sulfonic acid (PFBS)                   | 375-73-5    | 0.02 | µg/L  | <0.02                  | <0.02                  | <0.02                  | <0.02                  | ----  |
| Perfluoropentane sulfonic acid (PFPeS)                 | 2706-91-4   | 0.02 | µg/L  | <0.02                  | <0.02                  | <0.02                  | <0.02                  | ----  |
| Perfluorohexane sulfonic acid (PFHxS)                  | 355-46-4    | 0.01 | µg/L  | <0.01                  | <0.01                  | <0.01                  | <0.01                  | ----  |
| Perfluoroheptane sulfonic acid (PFHpS)                 | 375-92-8    | 0.02 | µg/L  | <0.02                  | <0.02                  | <0.02                  | <0.02                  | ----  |
| Perfluorooctane sulfonic acid (PFOS)                   | 1763-23-1   | 0.01 | µg/L  | <0.01                  | <0.01                  | <0.01                  | <0.01                  | ----  |
| Perfluorodecane sulfonic acid (PFDS)                   | 335-77-3    | 0.02 | µg/L  | <0.02                  | <0.02                  | <0.02                  | <0.02                  | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>         |             |      |       |                        |                        |                        |                        |       |
| 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                  | ----  |



## Analytical Results

Sub-Matrix: MARINE WATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0060_OTH132_21112<br>4 | 0960_OTH134_21112<br>4 | 0960_OTH129_21112<br>4 | 0960_OTH103_21112<br>4 | ----  |
|------------------------------------------------------------|-------------|------|------|------------------------|------------------------|------------------------|------------------------|-------|
| Sampling date / time                                       |             |      |      | 24-Nov-2021 10:38      | 24-Nov-2021 10:59      | 24-Nov-2021 11:33      | 24-Nov-2021 11:48      | ----  |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2114392-008          | EP2114392-009          | EP2114392-011          | EP2114392-012          | ----- |
|                                                            |             |      |      | Result                 | Result                 | Result                 | Result                 | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                        |                        |                        |                        |       |
| 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 (PFTTrDA)                        | 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                  | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                        |                        |                        |                        |       |
| 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                  | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                        |                        |                        |                        |       |
| 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                  | ----  |





## Analytical Results

Sub-Matrix: MARINE WATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0060_OTH132_21112<br>4 | 0960_OTH134_21112<br>4 | 0960_OTH129_21112<br>4 | 0960_OTH103_21112<br>4 | ----  |
|---------------------------------------------------------------|--------------------|------|------|------------------------|------------------------|------------------------|------------------------|-------|
| Sampling date / time                                          |                    |      |      | 24-Nov-2021 10:38      | 24-Nov-2021 10:59      | 24-Nov-2021 11:33      | 24-Nov-2021 11:48      | ----  |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2114392-008          | EP2114392-009          | EP2114392-011          | EP2114392-012          | ----- |
|                                                               |                    |      |      | Result                 | Result                 | Result                 | Result                 | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                        |                        |                        |                        |       |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05                  | <0.05                  | <0.05                  | <0.05                  | ----  |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                        |                        |                        |                        |       |
| Sum of PFAS                                                   | ----               | 0.01 | µg/L | <0.01                  | <0.01                  | <0.01                  | <0.01                  | ----  |
| Sum of PFHxS and PFOS                                         | 355-46-4/1763-23-1 | 0.01 | µg/L | <0.01                  | <0.01                  | <0.01                  | <0.01                  | ----  |
| Sum of PFAS (WA DER List)                                     | ----               | 0.01 | µg/L | <0.01                  | <0.01                  | <0.01                  | <0.01                  | ----  |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                        |                        |                        |                        |       |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 117                    | 108                    | 112                    | 100                    | ----  |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 72.4                   | 75.6                   | 74.4                   | 76.3                   | ----  |



## Analytical Results

Sub-Matrix: RINSATE  
 (Matrix: WATER)

Sample ID

| Sub-Matrix: RINSATE<br>(Matrix: WATER)        |            |      |      | Sample ID         | 0960_QC301_211124 | 0960_QC302_211124 | 0960_QC303_211124 | 0960_QC401_211124 | 0960_QC402_211124 |
|-----------------------------------------------|------------|------|------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                          |            |      |      | 24-Nov-2021 16:42 | 24-Nov-2021 16:45 | 24-Nov-2021 16:46 | 24-Nov-2021 16:47 | 24-Nov-2021 16:48 |                   |
| Compound                                      | CAS Number | LOR  | Unit | EP2114392-018     | EP2114392-019     | EP2114392-020     | EP2114392-021     | EP2114392-022     |                   |
|                                               |            |      |      | 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: RINSATE  
 (Matrix: WATER)

Sample ID

|                                                           |                    |      |      | 0960_QC301_211124 | 0960_QC302_211124 | 0960_QC303_211124 | 0960_QC401_211124 | 0960_QC402_211124 |
|-----------------------------------------------------------|--------------------|------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                      |                    |      |      | 24-Nov-2021 16:42 | 24-Nov-2021 16:45 | 24-Nov-2021 16:46 | 24-Nov-2021 16:47 | 24-Nov-2021 16:48 |
| Compound                                                  | CAS Number         | LOR  | Unit | EP2114392-018     | EP2114392-019     | EP2114392-020     | EP2114392-021     | EP2114392-022     |
|                                                           |                    |      |      | Result            | Result            | Result            | Result            | Result            |
| <b>EP231C: Perfluoroalkyl Sulfonamides - Continued</b>    |                    |      |      |                   |                   |                   |                   |                   |
| 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             |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>         |                    |      |      |                   |                   |                   |                   |                   |
| 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             |
| <b>EP231P: PFAS Sums</b>                                  |                    |      |      |                   |                   |                   |                   |                   |
| 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             |
| <b>EP231S: PFAS Surrogate</b>                             |                    |      |      |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                 | ----               | 0.02 | %    | 113               | 115               | 108               | 110               | 109               |
| 13C8-PFOA                                                 | ----               | 0.02 | %    | 80.2              | 82.9              | 115               | 120               | 116               |





## Analytical Results

Sub-Matrix: RINSATE  
 (Matrix: WATER)

Sample ID

0960\_QC403\_211124

| Sampling date / time                           |            |      |      | 24-Nov-2021 16:49 | ----  | ----  | ----  | ----  |
|------------------------------------------------|------------|------|------|-------------------|-------|-------|-------|-------|
| Compound                                       | CAS Number | LOR  | Unit | EP2114392-023     | ----- | ----- | ----- | ----- |
| Result                                         |            |      |      | ----              | ----  | ----  | ----  | ----  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>   |            |      |      |                   |       |       |       |       |
| 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             | ----  | ----  | ----  | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b> |            |      |      |                   |       |       |       |       |
| 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             | ----  | ----  | ----  | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>     |            |      |      |                   |       |       |       |       |
| 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<br>(Matrix: WATER)                    |                    |      |      | Sample ID         | 0960_QC403_211124 | ----  | ----  | ----  | ----  |
| Sampling date / time                                      |                    |      |      | 24-Nov-2021 16:49 | ----              | ----  | ----  | ----  | ----  |
| Compound                                                  | CAS Number         | LOR  | Unit | EP2114392-023     | -----             | ----- | ----- | ----- | ----- |
| 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 | %    | 105               | ----              | ----  | ----  | ----  | ----  |
| 13C8-PFOA                                                 | ----               | 0.02 | %    | 119               | ----              | ----  | ----  | ----  | ----  |



## Surrogate Control Limits

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

| Sub-Matrix: MARINE WATER      |            | Recovery Limits (%) |      |
|-------------------------------|------------|---------------------|------|
| Compound                      | CAS Number | Low                 | High |
| <b>EP231S: PFAS Surrogate</b> |            |                     |      |
| 13C4-PFOS                     | ----       | 60                  | 120  |
| 13C8-PFOA                     | ----       | 60                  | 120  |

| Sub-Matrix: RINSATE           |            | Recovery Limits (%) |      |
|-------------------------------|------------|---------------------|------|
| Compound                      | CAS Number | Low                 | High |
| <b>EP231S: PFAS Surrogate</b> |            |                     |      |
| 13C4-PFOS                     | ----       | 60                  | 120  |
| 13C8-PFOA                     | ----       | 60                  | 120  |

## Inter-Laboratory Testing

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

## QUALITY CONTROL REPORT

|                                |                                                                          |                                |                                                  |
|--------------------------------|--------------------------------------------------------------------------|--------------------------------|--------------------------------------------------|
| <b>Work Order</b>              | <b>: EP2114392</b>                                                       | <b>Page</b>                    | <b>: 1 of 11</b>                                 |
| <b>Client</b>                  | <b>: CARDNO (WA) PTY LTD</b>                                             | <b>Laboratory</b>              | <b>: Environmental Division Perth</b>            |
| <b>Contact</b>                 | <b>: [REDACTED]</b>                                                      | <b>Contact</b>                 | <b>: Customer Services EP</b>                    |
| <b>Address</b>                 | <b>: 11 HARVEST TERRACE PO BOX 155<br/>WEST PERTH WA, AUSTRALIA 6006</b> | <b>Address</b>                 | <b>: 26 Rigali Way Wangara WA Australia 6065</b> |
| <b>Telephone</b>               | <b>: ----</b>                                                            | <b>Telephone</b>               | <b>: +61-8-9406 1301</b>                         |
| <b>Project</b>                 | <b>: WA_0960_PFASOMP</b>                                                 | <b>Date Samples Received</b>   | <b>: 26-Nov-2021</b>                             |
| <b>Order number</b>            | <b>: DEF19009/0960</b>                                                   | <b>Date Analysis Commenced</b> | <b>: 30-Nov-2021</b>                             |
| <b>C-O-C number</b>            | <b>: 30608</b>                                                           | <b>Issue Date</b>              | <b>: 07-Dec-2021</b>                             |
| <b>Sampler</b>                 | <b>: [REDACTED]</b>                                                      |                                |                                                  |
| <b>Site</b>                    | <b>: DEF19009/Learmonth</b>                                              |                                |                                                  |
| <b>Quote number</b>            | <b>: SY/139/19</b>                                                       |                                |                                                  |
| <b>No. of samples received</b> | <b>: 23</b>                                                              |                                |                                                  |
| <b>No. of samples analysed</b> | <b>: 23</b>                                                              |                                |                                                  |



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]         | Laboratory Manager (Perth) | Perth Inorganics, Wangara, WA    |
| [REDACTED]         | Metals Chemist             | Perth Inorganics, Wangara, WA    |
| [REDACTED]         | LCMS Coordinator           | Sydney Organics, Smithfield, NSW |





## 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**

| Sub-Matrix: WATER                                                 |                    |                                          |             | Laboratory Duplicate (DUP) Report |      |                 |                  |         |                    |
|-------------------------------------------------------------------|--------------------|------------------------------------------|-------------|-----------------------------------|------|-----------------|------------------|---------|--------------------|
| Laboratory sample ID                                              | Sample ID          | Method: Compound                         | CAS Number  | LOR                               | Unit | Original Result | Duplicate Result | RPD (%) | Acceptable RPD (%) |
| ED037P: Alkalinity by PC Titrator (QC Lot: 4055129)               |                    |                                          |             |                                   |      |                 |                  |         |                    |
| EP2114392-002                                                     | 0960_MW148S_211124 | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                    | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                    | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 385             | 386              | 0.3     | 0% - 20%           |
|                                                                   |                    | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 385             | 386              | 0.3     | 0% - 20%           |
| EP2114392-012                                                     | 0960_OTH103_211124 | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                    | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | 4               | 4                | 0.0     | No Limit           |
|                                                                   |                    | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 121             | 121              | 0.0     | 0% - 20%           |
|                                                                   |                    | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 125             | 125              | 0.0     | 0% - 20%           |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4040543) |                    |                                          |             |                                   |      |                 |                  |         |                    |
| EP2114392-012                                                     | 0960_OTH103_211124 | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 2560            | 2620             | 2.3     | 0% - 20%           |
| EP2114392-001                                                     | 0960_MW148D_211124 | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 3550            | 3540             | 0.3     | 0% - 20%           |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4040944) |                    |                                          |             |                                   |      |                 |                  |         |                    |
| EP2114295-001                                                     | Anonymous          | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 593             | 598              | 0.8     | 0% - 20%           |
| EP2114295-011                                                     | Anonymous          | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 2620            | 2580             | 1.4     | 0% - 20%           |
| ED045G: Chloride by Discrete Analyser (QC Lot: 4040544)           |                    |                                          |             |                                   |      |                 |                  |         |                    |
| EP2114392-012                                                     | 0960_OTH103_211124 | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 18900           | 19300            | 2.1     | 0% - 20%           |
| EP2114392-001                                                     | 0960_MW148D_211124 | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 28400           | 28700            | 0.9     | 0% - 20%           |
| ED045G: Chloride by Discrete Analyser (QC Lot: 4040943)           |                    |                                          |             |                                   |      |                 |                  |         |                    |
| EP2114295-001                                                     | Anonymous          | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 2060            | 2080             | 0.6     | 0% - 20%           |
| EP2114295-011                                                     | Anonymous          | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 19200           | 18900            | 1.4     | 0% - 20%           |
| ED093F: Dissolved Major Cations (QC Lot: 4042967)                 |                    |                                          |             |                                   |      |                 |                  |         |                    |
| EP2114392-001                                                     | 0960_MW148D_211124 | ED093F: Calcium                          | 7440-70-2   | 1                                 | mg/L | 944             | 949              | 0.5     | 0% - 20%           |
|                                                                   |                    | ED093F: Magnesium                        | 7439-95-4   | 1                                 | mg/L | 1920            | 1930             | 0.8     | 0% - 20%           |



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 (%) |
| ED093F: Dissolved Major Cations (QC Lot: 4042967) - continued |                         |                                                |            |                                   |      |                 |                  |         |                    |
| EP2114392-001                                                 | 0960_MW148D_211124      | ED093F: Sodium                                 | 7440-23-5  | 1                                 | mg/L | 17900           | 18100            | 0.7     | 0% - 20%           |
|                                                               |                         | ED093F: Potassium                              | 7440-09-7  | 1                                 | mg/L | 781             | 789              | 1.0     | 0% - 20%           |
| EP2114392-012                                                 | 0960_OTH103_211124      | ED093F: Calcium                                | 7440-70-2  | 1                                 | mg/L | 468             | 458              | 2.2     | 0% - 20%           |
|                                                               |                         | ED093F: Magnesium                              | 7439-95-4  | 1                                 | mg/L | 1480            | 1450             | 2.0     | 0% - 20%           |
|                                                               |                         | ED093F: Sodium                                 | 7440-23-5  | 1                                 | mg/L | 11400           | 11300            | 1.4     | 0% - 20%           |
|                                                               |                         | ED093F: Potassium                              | 7440-09-7  | 1                                 | mg/L | 596             | 583              | 2.1     | 0% - 20%           |
| EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4053421)       |                         |                                                |            |                                   |      |                 |                  |         |                    |
| EP2114392-001                                                 | 0960_MW148D_211124      | EP231X: Perfluorohexane sulfonic acid (PFHxS)  | 355-46-4   | 0.01                              | µg/L | 4.07            | 4.38             | 7.3     | 0% - 20%           |
|                                                               |                         | EP231X: Perfluorooctane sulfonic acid (PFOS)   | 1763-23-1  | 0.01                              | µg/L | 2.56            | 2.44             | 4.8     | 0% - 20%           |
|                                                               |                         | EP231X: Perfluorobutane sulfonic acid (PFBS)   | 375-73-5   | 0.02                              | µg/L | 1.49            | 1.48             | 0.0     | 0% - 20%           |
|                                                               |                         | EP231X: Perfluoropentane sulfonic acid (PFPeS) | 2706-91-4  | 0.02                              | µg/L | 0.99            | 0.96             | 2.7     | 0% - 20%           |
|                                                               |                         | EP231X: Perfluoroheptane sulfonic acid (PFHpS) | 375-92-8   | 0.02                              | µg/L | 0.28            | 0.26             | 6.4     | 0% - 50%           |
|                                                               |                         | EP231X: Perfluorodecane sulfonic acid (PFDS)   | 335-77-3   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
| EP2114392-014                                                 | 0960_MW176_6-6.5_211124 | EP231X: Perfluorohexane sulfonic acid (PFHxS)  | 355-46-4   | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
|                                                               |                         | EP231X: Perfluorooctane sulfonic acid (PFOS)   | 1763-23-1  | 0.01                              | µg/L | 0.01            | 0.01             | 0.0     | No Limit           |
|                                                               |                         | EP231X: Perfluorobutane sulfonic acid (PFBS)   | 375-73-5   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                               |                         | EP231X: Perfluoropentane sulfonic acid (PFPeS) | 2706-91-4  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                               |                         | EP231X: Perfluoroheptane sulfonic acid (PFHpS) | 375-92-8   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                               |                         | EP231X: Perfluorodecane sulfonic acid (PFDS)   | 335-77-3   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
| EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4053512)       |                         |                                                |            |                                   |      |                 |                  |         |                    |
| EP2114471-004                                                 | Anonymous               | EP231X: Perfluorohexane sulfonic acid (PFHxS)  | 355-46-4   | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
|                                                               |                         | EP231X: Perfluorooctane sulfonic acid (PFOS)   | 1763-23-1  | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
|                                                               |                         | EP231X: Perfluorobutane sulfonic acid (PFBS)   | 375-73-5   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                               |                         | EP231X: Perfluoropentane sulfonic acid (PFPeS) | 2706-91-4  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                               |                         | EP231X: Perfluoroheptane sulfonic acid (PFHpS) | 375-92-8   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                               |                         | EP231X: Perfluorodecane sulfonic acid (PFDS)   | 335-77-3   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
| EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4053421)     |                         |                                                |            |                                   |      |                 |                  |         |                    |
| EP2114392-001                                                 | 0960_MW148D_211124      | EP231X: Perfluorooctanoic acid (PFOA)          | 335-67-1   | 0.01                              | µg/L | 0.25            | 0.26             | 0.0     | 0% - 20%           |
|                                                               |                         | EP231X: Perfluoropentanoic acid (PFPeA)        | 2706-90-3  | 0.02                              | µg/L | 0.34            | 0.34             | 0.0     | 0% - 50%           |
|                                                               |                         | EP231X: Perfluorohexanoic acid (PFHxA)         | 307-24-4   | 0.02                              | µg/L | 1.95            | 1.99             | 2.0     | 0% - 20%           |
|                                                               |                         | EP231X: Perfluoroheptanoic acid (PFHpA)        | 375-85-9   | 0.02                              | µg/L | 0.17            | 0.17             | 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 | 0.2             | 0.2              | 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 (%) |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4053421) - continued</b> |                         |                                                                   |            |                                   |      |                 |                  |         |                    |
| EP2114392-014                                                                | 0960_MW176_6-6.5_211124 | 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 | 0.04            | 0.04             | 0.0     | No Limit           |
|                                                                              |                         | EP231X: Perfluoroheptanoic acid (PFHpA)                           | 375-85-9   | 0.02                              | µg/L | 0.21            | 0.21             | 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 (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           |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4053512)</b>             |                         |                                                                   |            |                                   |      |                 |                  |         |                    |
| EP2114471-004                                                                | Anonymous               | EP231X: Perfluorooctanoic acid (PFOA)                             | 335-67-1   | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
|                                                                              |                         | EP231X: Perfluoropentanoic acid (PFPeA)                           | 2706-90-3  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                              |                         | EP231X: Perfluorohexanoic acid (PFHxA)                            | 307-24-4   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                              |                         | EP231X: Perfluoroheptanoic acid (PFHpA)                           | 375-85-9   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                              |                         | EP231X: Perfluorononanoic acid (PFNA)                             | 375-95-1   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                              |                         | EP231X: Perfluorodecanoic acid (PFDA)                             | 335-76-2   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                              |                         | EP231X: Perfluoroundecanoic acid (PFUnDA)                         | 2058-94-8  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                              |                         | EP231X: Perfluorododecanoic acid (PFDoDA)                         | 307-55-1   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                              |                         | EP231X: Perfluorotridecanoic acid (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           |
| <b>EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4053421)</b>                 |                         |                                                                   |            |                                   |      |                 |                  |         |                    |
| EP2114392-001                                                                | 0960_MW148D_211124      | 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           |
|                                                                              |                         | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
| EP2114392-014                                                                | 0960_MW176_6-6.5_211124 | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | 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 (%) |
| EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4053421) - continued |                         |                                                                   |             |                                   |      |                 |                  |         |                    |
| EP2114392-014                                                     | 0960_MW176_6-6.5_211124 | 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: 4053512)             |                         |                                                                   |             |                                   |      |                 |                  |         |                    |
| EP2114471-004                                                     | Anonymous               | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                   |                         | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                   |                         | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                   |                         | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |                         | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |                         | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |                         | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4053421)      |                         |                                                                   |             |                                   |      |                 |                  |         |                    |
| EP2114392-001                                                     | 0960_MW148D_211124      | 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           |
| EP2114392-014                                                     | 0960_MW176_6-6.5_211124 | 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           |



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 Work Order : EP2114392  
 Client : CARDNO (WA) PTY LTD  
 Project : WA\_0960\_PFASOMP



| Sub-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: 4053421) - continued |                         |                                                     |             |                                   |      |                 |                  |         |                    |
| EP2114392-014                                                            | 0960_MW176_6-6.5_211124 | 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: 4053512)             |                         |                                                     |             |                                   |      |                 |                  |         |                    |
| EP2114471-004                                                            | Anonymous               | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)   | 757124-72-4 | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                          |                         | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)   | 27619-97-2  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                          |                         | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)   | 39108-34-4  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                          |                         | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS) | 120226-60-0 | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
| EP231P: PFAS Sums (QC Lot: 4053421)                                      |                         |                                                     |             |                                   |      |                 |                  |         |                    |
| EP2114392-001                                                            | 0960_MW148D_211124      | EP231X: Sum of PFAS                                 | ----        | 0.01                              | µg/L | 12.3            | 12.5             | 1.5     | 0% - 20%           |
| EP2114392-014                                                            | 0960_MW176_6-6.5_211124 | EP231X: Sum of PFAS                                 | ----        | 0.01                              | µg/L | 0.26            | 0.26             | 0.0     | 0% - 20%           |
| EP231P: PFAS Sums (QC Lot: 4053512)                                      |                         |                                                     |             |                                   |      |                 |                  |         |                    |
| EP2114471-004                                                            | Anonymous               | EP231X: Sum of PFAS                                 | ----        | 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**

| Sub-Matrix: WATER                                                |            |      |      | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |      |
|------------------------------------------------------------------|------------|------|------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|------|
|                                                                  |            |      |      |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |      |
| Method: Compound                                                 | CAS Number | LOR  | Unit | Result                      |                                       |                           |                                   |      |
| ED037P: Alkalinity by PC Titrator (QCLot: 4055129)               |            |      |      |                             |                                       |                           |                                   |      |
| ED037-P: Hydroxide Alkalinity as CaCO3                           | DMO-210-00 | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
|                                                                  | 1          |      |      |                             |                                       |                           |                                   |      |
| ED037-P: Carbonate Alkalinity as CaCO3                           | 3812-32-6  | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Bicarbonate Alkalinity as CaCO3                         | 71-52-3    | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Total Alkalinity as CaCO3                               | ----       | 1    | mg/L | <1                          | 20 mg/L                               | 107                       | 81.2                              | 126  |
|                                                                  |            |      |      | <1                          | 200 mg/L                              | 101                       | 90.0                              | 110  |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4040543) |            |      |      |                             |                                       |                           |                                   |      |
| ED041G: Sulfate as SO4 - Turbidimetric                           | 14808-79-8 | 1    | mg/L | <1                          | 25 mg/L                               | 99.6                      | 87.7                              | 113  |
|                                                                  |            |      |      | <1                          | 500 mg/L                              | 101                       | 87.7                              | 113  |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4040944) |            |      |      |                             |                                       |                           |                                   |      |
| ED041G: Sulfate as SO4 - Turbidimetric                           | 14808-79-8 | 1    | mg/L | <1                          | 25 mg/L                               | 99.6                      | 87.7                              | 113  |
|                                                                  |            |      |      | <1                          | 500 mg/L                              | 104                       | 87.7                              | 113  |
| ED045G: Chloride by Discrete Analyser (QCLot: 4040544)           |            |      |      |                             |                                       |                           |                                   |      |
| ED045G: Chloride                                                 | 16887-00-6 | 1    | mg/L | <1                          | 10 mg/L                               | 94.9                      | 87.9                              | 114  |
|                                                                  |            |      |      | <1                          | 1000 mg/L                             | 103                       | 87.9                              | 114  |
| ED045G: Chloride by Discrete Analyser (QCLot: 4040943)           |            |      |      |                             |                                       |                           |                                   |      |
| ED045G: Chloride                                                 | 16887-00-6 | 1    | mg/L | <1                          | 10 mg/L                               | 94.4                      | 87.9                              | 114  |
|                                                                  |            |      |      | <1                          | 1000 mg/L                             | 102                       | 87.9                              | 114  |
| ED093F: Dissolved Major Cations (QCLot: 4042967)                 |            |      |      |                             |                                       |                           |                                   |      |
| ED093F: Calcium                                                  | 7440-70-2  | 1    | mg/L | <1                          | 50 mg/L                               | 96.6                      | 85.9                              | 113  |
| ED093F: Magnesium                                                | 7439-95-4  | 1    | mg/L | <1                          | 50 mg/L                               | 93.9                      | 88.0                              | 110  |
| ED093F: Sodium                                                   | 7440-23-5  | 1    | mg/L | <1                          | 50 mg/L                               | 102                       | 87.3                              | 118  |
| ED093F: Potassium                                                | 7440-09-7  | 1    | mg/L | <1                          | 50 mg/L                               | 91.6                      | 89.7                              | 108  |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4053421)           |            |      |      |                             |                                       |                           |                                   |      |
| EP231X: Perfluorobutane sulfonic acid (PFBS)                     | 375-73-5   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 122                       | 72.0                              | 130  |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)                   | 2706-91-4  | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 121                       | 71.0                              | 127  |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)                    | 355-46-4   | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 121                       | 68.0                              | 131  |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)                   | 375-92-8   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 111                       | 69.0                              | 134  |
| EP231X: Perfluorooctane sulfonic acid (PFOS)                     | 1763-23-1  | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 115                       | 65.0                              | 140  |
| EP231X: Perfluorodecane sulfonic acid (PFDS)                     | 335-77-3   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 102                       | 53.0                              | 142  |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4053512)           |            |      |      |                             |                                       |                           |                                   |      |
| EP231X: Perfluorobutane sulfonic acid (PFBS)                     | 375-73-5   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 120                       | 72.0                              | 130  |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)                   | 2706-91-4  | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 127                       | 71.0                              | 127  |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)                    | 355-46-4   | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 125                       | 68.0                              | 131  |



Sub-Matrix: **WATER**

| Method: Compound                                                          |            |      |      | Method Blank (MB)<br>Report<br>Result | Laboratory Control Spike (LCS) Report |                           |                       |      |
|---------------------------------------------------------------------------|------------|------|------|---------------------------------------|---------------------------------------|---------------------------|-----------------------|------|
|                                                                           |            |      |      |                                       | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%) |      |
|                                                                           |            |      |      |                                       |                                       |                           | Low                   | High |
| CAS Number                                                                | LOR        | Unit |      |                                       |                                       |                           |                       |      |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4053512) - continued</b> |            |      |      |                                       |                                       |                           |                       |      |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)                            | 375-92-8   | 0.02 | µg/L | <0.02                                 | 0.25 µg/L                             | 119                       | 69.0                  | 134  |
| EP231X: Perfluorooctane sulfonic acid (PFOS)                              | 1763-23-1  | 0.01 | µg/L | <0.01                                 | 0.25 µg/L                             | 124                       | 65.0                  | 140  |
| EP231X: Perfluorodecane sulfonic acid (PFDS)                              | 335-77-3   | 0.02 | µg/L | <0.02                                 | 0.25 µg/L                             | 112                       | 53.0                  | 142  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4053421)</b>           |            |      |      |                                       |                                       |                           |                       |      |
| EP231X: Perfluorobutanoic acid (PFBA)                                     | 375-22-4   | 0.1  | µg/L | <0.1                                  | 1.25 µg/L                             | 118                       | 73.0                  | 129  |
| EP231X: Perfluoropentanoic acid (PFPeA)                                   | 2706-90-3  | 0.02 | µg/L | <0.02                                 | 0.25 µg/L                             | 124                       | 72.0                  | 129  |
| EP231X: Perfluorohexanoic acid (PFHxA)                                    | 307-24-4   | 0.02 | µg/L | <0.02                                 | 0.25 µg/L                             | 125                       | 72.0                  | 129  |
| EP231X: Perfluoroheptanoic acid (PFHpA)                                   | 375-85-9   | 0.02 | µg/L | <0.02                                 | 0.25 µg/L                             | 128                       | 72.0                  | 130  |
| EP231X: Perfluorooctanoic acid (PFOA)                                     | 335-67-1   | 0.01 | µg/L | <0.01                                 | 0.25 µg/L                             | 132                       | 71.0                  | 133  |
| EP231X: Perfluorononanoic acid (PFNA)                                     | 375-95-1   | 0.02 | µg/L | <0.02                                 | 0.25 µg/L                             | 120                       | 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                             | 119                       | 69.0                  | 133  |
| EP231X: Perfluorododecanoic acid (PFDoDA)                                 | 307-55-1   | 0.02 | µg/L | <0.02                                 | 0.25 µg/L                             | 126                       | 72.0                  | 134  |
| EP231X: Perfluorotridecanoic acid (PFTriDA)                               | 72629-94-8 | 0.02 | µg/L | <0.02                                 | 0.25 µg/L                             | 122                       | 65.0                  | 144  |
| EP231X: Perfluorotetradecanoic acid (PFTeDA)                              | 376-06-7   | 0.05 | µg/L | <0.05                                 | 0.625 µg/L                            | 125                       | 71.0                  | 132  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4053512)</b>           |            |      |      |                                       |                                       |                           |                       |      |
| 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                             | 125                       | 72.0                  | 129  |
| EP231X: Perfluorohexanoic acid (PFHxA)                                    | 307-24-4   | 0.02 | µg/L | <0.02                                 | 0.25 µg/L                             | 128                       | 72.0                  | 129  |
| EP231X: Perfluoroheptanoic acid (PFHpA)                                   | 375-85-9   | 0.02 | µg/L | <0.02                                 | 0.25 µg/L                             | 122                       | 72.0                  | 130  |
| EP231X: Perfluorooctanoic acid (PFOA)                                     | 335-67-1   | 0.01 | µg/L | <0.01                                 | 0.25 µg/L                             | 122                       | 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                             | 122                       | 71.0                  | 129  |
| EP231X: Perfluoroundecanoic acid (PFUnDA)                                 | 2058-94-8  | 0.02 | µg/L | <0.02                                 | 0.25 µg/L                             | 112                       | 69.0                  | 133  |
| EP231X: Perfluorododecanoic acid (PFDoDA)                                 | 307-55-1   | 0.02 | µg/L | <0.02                                 | 0.25 µg/L                             | 123                       | 72.0                  | 134  |
| EP231X: Perfluorotridecanoic acid (PFTriDA)                               | 72629-94-8 | 0.02 | µg/L | <0.02                                 | 0.25 µg/L                             | 118                       | 65.0                  | 144  |
| EP231X: Perfluorotetradecanoic acid (PFTeDA)                              | 376-06-7   | 0.05 | µg/L | <0.05                                 | 0.625 µg/L                            | 114                       | 71.0                  | 132  |
| <b>EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4053421)</b>               |            |      |      |                                       |                                       |                           |                       |      |
| EP231X: Perfluorooctane sulfonamide (FOSA)                                | 754-91-6   | 0.02 | µg/L | <0.02                                 | 0.25 µg/L                             | 125                       | 67.0                  | 137  |
| EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)                     | 31506-32-8 | 0.05 | µg/L | <0.05                                 | 0.625 µg/L                            | 132                       | 68.0                  | 141  |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)                      | 4151-50-2  | 0.05 | µg/L | <0.05                                 | 0.625 µg/L                            | 120                       | 62.6                  | 147  |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)              | 24448-09-7 | 0.05 | µg/L | <0.05                                 | 0.625 µg/L                            | 116                       | 66.0                  | 145  |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)               | 1691-99-2  | 0.05 | µg/L | <0.05                                 | 0.625 µg/L                            | 122                       | 57.6                  | 145  |
| EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)         | 2355-31-9  | 0.02 | µg/L | <0.02                                 | 0.25 µg/L                             | 131                       | 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  |

### Method Blank (MB) Report

### Spike

**Spike Recovery (%)**

**Acceptable Limits (%)**

CAS Number

**LOR**

Unit

## Result

### Concentration

LCS

*Low*

**High**

|                                                                   |            |      |      |       |            |      |      |     |
|-------------------------------------------------------------------|------------|------|------|-------|------------|------|------|-----|
| EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6   | 0.02 | µg/L | <0.02 | 0.25 µg/L  | 119  | 67.0 | 137 |
| EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8 | 0.05 | µg/L | <0.05 | 0.625 µg/L | 74.1 | 68.0 | 141 |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2  | 0.05 | µg/L | <0.05 | 0.625 µg/L | 85.9 | 62.6 | 147 |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7 | 0.05 | µg/L | <0.05 | 0.625 µg/L | 97.3 | 66.0 | 145 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2  | 0.05 | µg/L | <0.05 | 0.625 µg/L | 113  | 57.6 | 145 |
| EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9  | 0.02 | µg/L | <0.02 | 0.25 µg/L  | 133  | 65.0 | 136 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6  | 0.02 | µg/L | <0.02 | 0.25 µg/L  | 127  | 61.0 | 135 |

|                                                     |             |      |      |       |           |      |      |     |
|-----------------------------------------------------|-------------|------|------|-------|-----------|------|------|-----|
| EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)   | 757124-72-4 | 0.05 | µg/L | <0.05 | 0.25 µg/L | 139  | 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 | 80.6 | 64.0 | 140 |
| EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)   | 39108-34-4  | 0.05 | µg/L | <0.05 | 0.25 µg/L | 138  | 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 | 107  | 71.4 | 144 |

|                                                     |             |      |      |       |           |      |      |     |
|-----------------------------------------------------|-------------|------|------|-------|-----------|------|------|-----|
| EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)   | 757124-72-4 | 0.05 | µg/L | <0.05 | 0.25 µg/L | 136  | 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 | 132  | 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 | 111  | 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 | 91.2 | 71.4 | 144 |

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.

### Matrix Spike (MS) Report

### Spike

SpikeRecovery(%)

### Acceptable Limits (%)

Laboratory sample ID

**Sample ID**

**Method:** Compound

CAS Number

### Concentration

MS

*Low*

*High*

|               |           |                                        |            |          |     |      |     |
|---------------|-----------|----------------------------------------|------------|----------|-----|------|-----|
| EP2114161-002 | Anonymous | ED041G: Sulfate as SO4 - Turbidimetric | 14808-79-8 | 100 mg/L | 100 | 70.0 | 130 |
|---------------|-----------|----------------------------------------|------------|----------|-----|------|-----|

|               |           |                                        |            |          |                  |      |     |
|---------------|-----------|----------------------------------------|------------|----------|------------------|------|-----|
| EP2114295-001 | Anonymous | ED041G: Sulfate as SO4 - Turbidimetric | 14808-79-8 | 100 mg/L | # Not Determined | 70.0 | 130 |
|---------------|-----------|----------------------------------------|------------|----------|------------------|------|-----|

|               |                    |                  |            |           |                  |      |     |
|---------------|--------------------|------------------|------------|-----------|------------------|------|-----|
| EP2114392-001 | 0960_MW148D_211124 | ED045G: Chloride | 16887-00-6 | 1000 mg/L | # Not Determined | 70.0 | 130 |
|---------------|--------------------|------------------|------------|-----------|------------------|------|-----|

## ED045G: Chloride by Discrete Analyser (QCLot: 4040943)





Sub-Matrix: **WATER**

| Sub-Matrix: WATER                                                  |                    |                                                                   |             | Matrix Spike (MS) Report |                  |                       |      |
|--------------------------------------------------------------------|--------------------|-------------------------------------------------------------------|-------------|--------------------------|------------------|-----------------------|------|
|                                                                    |                    |                                                                   |             | Spike                    | SpikeRecovery(%) | Acceptable Limits (%) |      |
| Laboratory sample ID                                               | Sample ID          | Method: Compound                                                  | CAS Number  | Concentration            | MS               | Low                   | High |
| ED045G: Chloride by Discrete Analyser (QCLot: 4040943) - continued |                    |                                                                   |             |                          |                  |                       |      |
| EP2114295-001                                                      | Anonymous          | ED045G: Chloride                                                  | 16887-00-6  | 1000 mg/L                | 94.5             | 70.0                  | 130  |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4053421)             |                    |                                                                   |             |                          |                  |                       |      |
| EP2114392-012                                                      | 0960_OTH103_211124 | EP231X: Perfluorobutane sulfonic acid (PFBS)                      | 375-73-5    | 0.25 µg/L                | 120              | 72.0                  | 130  |
|                                                                    |                    | EP231X: Perfluoropentane sulfonic acid (PFPeS)                    | 2706-91-4   | 0.25 µg/L                | 116              | 71.0                  | 127  |
|                                                                    |                    | EP231X: Perfluorohexane sulfonic acid (PFHxS)                     | 355-46-4    | 0.25 µg/L                | 117              | 68.0                  | 131  |
|                                                                    |                    | EP231X: Perfluoroheptane sulfonic acid (PFHpS)                    | 375-92-8    | 0.25 µg/L                | 114              | 69.0                  | 134  |
|                                                                    |                    | EP231X: Perfluorooctane sulfonic acid (PFOS)                      | 1763-23-1   | 0.25 µg/L                | 116              | 65.0                  | 140  |
|                                                                    |                    | EP231X: Perfluorodecane sulfonic acid (PFDS)                      | 335-77-3    | 0.25 µg/L                | 105              | 53.0                  | 142  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4053421)           |                    |                                                                   |             |                          |                  |                       |      |
| EP2114392-012                                                      | 0960_OTH103_211124 | EP231X: Perfluorobutanoic acid (PFBA)                             | 375-22-4    | 1.25 µg/L                | 107              | 73.0                  | 129  |
|                                                                    |                    | EP231X: Perfluoropentanoic acid (PFPeA)                           | 2706-90-3   | 0.25 µg/L                | 128              | 72.0                  | 129  |
|                                                                    |                    | EP231X: Perfluorohexanoic acid (PFHxA)                            | 307-24-4    | 0.25 µg/L                | 129              | 72.0                  | 129  |
|                                                                    |                    | EP231X: Perfluoroheptanoic acid (PFHpA)                           | 375-85-9    | 0.25 µg/L                | 128              | 72.0                  | 130  |
|                                                                    |                    | EP231X: Perfluorooctanoic acid (PFOA)                             | 335-67-1    | 0.25 µg/L                | 127              | 71.0                  | 133  |
|                                                                    |                    | EP231X: Perfluorononanoic acid (PFNA)                             | 375-95-1    | 0.25 µg/L                | 114              | 69.0                  | 130  |
|                                                                    |                    | EP231X: Perfluorodecanoic acid (PFDA)                             | 335-76-2    | 0.25 µg/L                | 127              | 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                | 121              | 72.0                  | 134  |
|                                                                    |                    | EP231X: Perfluorotridecanoic acid (PFTrDA)                        | 72629-94-8  | 0.25 µg/L                | 113              | 65.0                  | 144  |
|                                                                    |                    | EP231X: Perfluorotetradecanoic acid (PFTeDA)                      | 376-06-7    | 0.625 µg/L               | 122              | 71.0                  | 132  |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4053421)               |                    |                                                                   |             |                          |                  |                       |      |
| EP2114392-012                                                      | 0960_OTH103_211124 | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.25 µg/L                | 116              | 67.0                  | 137  |
|                                                                    |                    | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.625 µg/L               | 104              | 68.0                  | 141  |
|                                                                    |                    | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.625 µg/L               | 106              | 62.6                  | 147  |
|                                                                    |                    | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.625 µg/L               | 112              | 66.0                  | 145  |
|                                                                    |                    | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.625 µg/L               | 119              | 57.6                  | 145  |
|                                                                    |                    | 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                | 125              | 61.0                  | 135  |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4053421)        |                    |                                                                   |             |                          |                  |                       |      |
| EP2114392-012                                                      | 0960_OTH103_211124 | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.25 µg/L                | 81.0             | 63.0                  | 143  |
|                                                                    |                    | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 27619-97-2  | 0.25 µg/L                | 140              | 64.0                  | 140  |
|                                                                    |                    | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | 39108-34-4  | 0.25 µg/L                | 134              | 67.0                  | 138  |
|                                                                    |                    | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | 120226-60-0 | 0.25 µg/L                | 102              | 71.4                  | 144  |

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Work Order : EP2114392  
Client : CARDNO (WA) PTY LTD  
Project : WA\_0960\_PFASOMP

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## QA/QC Compliance Assessment to assist with Quality Review

|              |                       |                         |                                |
|--------------|-----------------------|-------------------------|--------------------------------|
| Work Order   | : EP2114392           | Page                    | : 1 of 8                       |
| Client       | : CARDNO (WA) PTY LTD | Laboratory              | : Environmental Division Perth |
| Contact      | : [REDACTED]          | Telephone               | : +61-8-9406 1301              |
| Project      | : WA_0960_PFASOMP     | Date Samples Received   | : 26-Nov-2021                  |
| Site         | : DEF19009/Learmonth  | Issue Date              | : 07-Dec-2021                  |
| Sampler      | : [REDACTED]          | No. of samples received | : 23                           |
| Order number | : DEF19009/0960       | No. of samples analysed | : 23                           |

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

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

### Summary of Outliers

#### Outliers : Quality Control Samples

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

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

#### Outliers : Analysis Holding Time Compliance

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

#### Outliers : Frequency of Quality Control Samples

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



### Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

| Compound Group Name                             | Laboratory Sample ID | Client Sample ID   | Analyte                           | CAS Number | Data           | Limits | Comment                                                                               |
|-------------------------------------------------|----------------------|--------------------|-----------------------------------|------------|----------------|--------|---------------------------------------------------------------------------------------|
| <b>Matrix Spike (MS) Recoveries</b>             |                      |                    |                                   |            |                |        |                                                                                       |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA | EP2114295--001       | Anonymous          | Sulfate as SO4 -<br>Turbidimetric | 14808-79-8 | Not Determined | ----   | MS recovery not determined, background level greater than or equal to 4x spike level. |
| ED045G: Chloride by Discrete Analyser           | EP2114392--001       | 0960_MW148D_211124 | Chloride                          | 16887-00-6 | Not Determined | ----   | MS recovery not determined, background level greater than or equal to 4x spike level. |

### Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

| Quality Control Sample Type                          | Count |         | Rate (%) |          | Quality Control Specification  |
|------------------------------------------------------|-------|---------|----------|----------|--------------------------------|
| Method                                               | QC    | Regular | Actual   | Expected |                                |
| <b>Laboratory Duplicates (DUP)</b>                   |       |         |          |          |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | 3     | 38      | 7.89     | 10.00    | NEPM 2013 B3 & ALS QC Standard |
| <b>Matrix Spikes (MS)</b>                            |       |         |          |          |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | 1     | 38      | 2.63     | 5.00     | NEPM 2013 B3 & ALS QC Standard |

## Analysis Holding Time Compliance

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

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

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

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

Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                   |                          | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |
|------------------------------------------|--------------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|
| Container / Client Sample ID(s)          |                          |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| ED037P: Alkalinity by PC Titrator        |                          |             |                          |                    |            |               |                  |            |
| Clear Plastic Bottle - Natural (ED037-P) |                          | 24-Nov-2021 | ----                     | ----               | ----       | 04-Dec-2021   | 08-Dec-2021      | ✔          |
| 0960_MW148D_211124,                      | 0960_MW148S_211124,      |             |                          |                    |            |               |                  |            |
| 0960_MW012_211124,                       | 0960_MW151_211124,       |             |                          |                    |            |               |                  |            |
| 0960_MW105_211124,                       | 0960_QC116_211124,       |             |                          |                    |            |               |                  |            |
| 0060_OTH132_211124,                      | 0960_OTH134_211124,      |             |                          |                    |            |               |                  |            |
| 0960_MW175_5.5-6.0_211124,               | 0960_OTH129_211124,      |             |                          |                    |            |               |                  |            |
| 0960_OTH103_211124,                      | 0960_MW177_3.5-4_211124, |             |                          |                    |            |               |                  |            |
| 0960_MW176_6-6.5_211124,                 | 0960_MW178_9-9.5_211124, |             |                          |                    |            |               |                  |            |
| 0960_MW135_6.4-7_211124,                 | 0960_MW144_3-3.5_211124  |             |                          |                    |            |               |                  |            |



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 Work Order : EP2114392  
 Client : CARDNO (WA) PTY LTD  
 Project : WA\_0960\_PFASOMP



Matrix: **WATER**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

| Method                                                                                                                                                                                                                                        | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|
| Container / Client Sample ID(s)                                                                                                                                                                                                               |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA                                                                                                                                                                                               |             |                          |                    |            |               |                  |            |
| Clear Plastic Bottle - Natural (ED041G)<br>0960_OTH134_211124                                                                                                                                                                                 | 24-Nov-2021 | ----                     | ----               | ----       | 01-Dec-2021   | 22-Dec-2021      | ✓          |
| Clear Plastic Bottle - Natural (ED041G)<br>0960_MW148D_211124,<br>0960_MW012_211124,<br>0960_MW105_211124,<br>0060_OTH132_211124,<br>0960_OTH129_211124,<br>0960_MW177_3.5-4_211124,<br>0960_MW178_9-9.5_211124,<br>0960_MW144_3-3.5_211124   | 24-Nov-2021 | ----                     | ----               | ----       | 06-Dec-2021   | 22-Dec-2021      | ✓          |
| ED045G: Chloride by Discrete Analyser                                                                                                                                                                                                         |             |                          |                    |            |               |                  |            |
| Clear Plastic Bottle - Natural (ED045G)<br>0960_OTH134_211124                                                                                                                                                                                 | 24-Nov-2021 | ----                     | ----               | ----       | 01-Dec-2021   | 22-Dec-2021      | ✓          |
| Clear Plastic Bottle - Natural (ED045G)<br>0960_MW148D_211124,<br>0960_MW012_211124,<br>0960_MW105_211124,<br>0060_OTH132_211124,<br>0960_OTH129_211124,<br>0960_MW177_3.5-4_211124,<br>0960_MW178_9-9.5_211124,<br>0960_MW144_3-3.5_211124   | 24-Nov-2021 | ----                     | ----               | ----       | 06-Dec-2021   | 22-Dec-2021      | ✓          |
| ED093F: Dissolved Major Cations                                                                                                                                                                                                               |             |                          |                    |            |               |                  |            |
| Clear Plastic Bottle - Natural (ED093F)<br>0960_MW148D_211124,<br>0960_MW012_211124,<br>0960_MW105_211124,<br>0060_OTH132_211124,<br>0960_MW175_5.5-6.0_211124,<br>0960_OTH103_211124,<br>0960_MW176_6-6.5_211124,<br>0960_MW135_6.4-7_211124 | 24-Nov-2021 | ----                     | ----               | ----       | 30-Nov-2021   | 01-Dec-2021      | ✓          |



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                           | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|
| Container / Client Sample ID(s)                                                                                                                                                                                                                                         |                                                                                                                                                                                                                           |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| EP231A: Perfluoroalkyl Sulfonic Acids                                                                                                                                                                                                                                   |                                                                                                                                                                                                                           |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)<br>0960_QC303_211124,<br>0960_QC402_211124,                                                                                                                                                                                                     | 0960_QC401_211124,<br>0960_QC403_211124                                                                                                                                                                                   | 24-Nov-2021 | 03-Dec-2021              | 23-May-2022        | ✔          | 06-Dec-2021   | 23-May-2022      | ✔          |
| HDPE (no PTFE) (EP231X)<br>0960_MW148D_211124,<br>0960_MW012_211124,<br>0960_MW151_211124,<br>0960_QC116_211124,<br>0960_OTH134_211124,<br>0960_OTH129_211124,<br>0960_MW177_3.5-4_211124,<br>0960_MW178_9-9.5_211124,<br>0960_MW144_3-3.5_211124,<br>0960_QC302_211124 | 0960_MW148S_211124,<br>0960_QC115_211124,<br>0960_MW105_211124,<br>0060_OTH132_211124,<br>0960_MW175_5.5-6.0_211124,<br>0960_OTH103_211124,<br>0960_MW176_6-6.5_211124,<br>0960_MW135_6.4-7_211124,<br>0960_QC301_211124, | 24-Nov-2021 | 06-Dec-2021              | 23-May-2022        | ✔          | 06-Dec-2021   | 23-May-2022      | ✔          |
| EP231B: Perfluoroalkyl Carboxylic Acids                                                                                                                                                                                                                                 |                                                                                                                                                                                                                           |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)<br>0960_QC303_211124,<br>0960_QC402_211124,                                                                                                                                                                                                     | 0960_QC401_211124,<br>0960_QC403_211124                                                                                                                                                                                   | 24-Nov-2021 | 03-Dec-2021              | 23-May-2022        | ✔          | 06-Dec-2021   | 23-May-2022      | ✔          |
| HDPE (no PTFE) (EP231X)<br>0960_MW148D_211124,<br>0960_MW012_211124,<br>0960_MW151_211124,<br>0960_QC116_211124,<br>0960_OTH134_211124,<br>0960_OTH129_211124,<br>0960_MW177_3.5-4_211124,<br>0960_MW178_9-9.5_211124,<br>0960_MW144_3-3.5_211124,<br>0960_QC302_211124 | 0960_MW148S_211124,<br>0960_QC115_211124,<br>0960_MW105_211124,<br>0060_OTH132_211124,<br>0960_MW175_5.5-6.0_211124,<br>0960_OTH103_211124,<br>0960_MW176_6-6.5_211124,<br>0960_MW135_6.4-7_211124,<br>0960_QC301_211124, | 24-Nov-2021 | 06-Dec-2021              | 23-May-2022        | ✔          | 06-Dec-2021   | 23-May-2022      | ✔          |



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                           | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|
| Container / Client Sample ID(s)                                                                                                                                                                                                                                         |                                                                                                                                                                                                                           |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| EP231C: Perfluoroalkyl Sulfonamides                                                                                                                                                                                                                                     |                                                                                                                                                                                                                           |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)<br>0960_QC303_211124,<br>0960_QC402_211124,                                                                                                                                                                                                     | 0960_QC401_211124,<br>0960_QC403_211124                                                                                                                                                                                   | 24-Nov-2021 | 03-Dec-2021              | 23-May-2022        | ✔          | 06-Dec-2021   | 23-May-2022      | ✔          |
| HDPE (no PTFE) (EP231X)<br>0960_MW148D_211124,<br>0960_MW012_211124,<br>0960_MW151_211124,<br>0960_QC116_211124,<br>0960_OTH134_211124,<br>0960_OTH129_211124,<br>0960_MW177_3.5-4_211124,<br>0960_MW178_9-9.5_211124,<br>0960_MW144_3-3.5_211124,<br>0960_QC302_211124 | 0960_MW148S_211124,<br>0960_QC115_211124,<br>0960_MW105_211124,<br>0060_OTH132_211124,<br>0960_MW175_5.5-6.0_211124,<br>0960_OTH103_211124,<br>0960_MW176_6-6.5_211124,<br>0960_MW135_6.4-7_211124,<br>0960_QC301_211124, | 24-Nov-2021 | 06-Dec-2021              | 23-May-2022        | ✔          | 06-Dec-2021   | 23-May-2022      | ✔          |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids                                                                                                                                                                                                                              |                                                                                                                                                                                                                           |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)<br>0960_QC303_211124,<br>0960_QC402_211124,                                                                                                                                                                                                     | 0960_QC401_211124,<br>0960_QC403_211124                                                                                                                                                                                   | 24-Nov-2021 | 03-Dec-2021              | 23-May-2022        | ✔          | 06-Dec-2021   | 23-May-2022      | ✔          |
| HDPE (no PTFE) (EP231X)<br>0960_MW148D_211124,<br>0960_MW012_211124,<br>0960_MW151_211124,<br>0960_QC116_211124,<br>0960_OTH134_211124,<br>0960_OTH129_211124,<br>0960_MW177_3.5-4_211124,<br>0960_MW178_9-9.5_211124,<br>0960_MW144_3-3.5_211124,<br>0960_QC302_211124 | 0960_MW148S_211124,<br>0960_QC115_211124,<br>0960_MW105_211124,<br>0060_OTH132_211124,<br>0960_MW175_5.5-6.0_211124,<br>0960_OTH103_211124,<br>0960_MW176_6-6.5_211124,<br>0960_MW135_6.4-7_211124,<br>0960_QC301_211124, | 24-Nov-2021 | 06-Dec-2021              | 23-May-2022        | ✔          | 06-Dec-2021   | 23-May-2022      | ✔          |

Page : 6 of 8  
 Work Order : EP2114392  
 Client : CARDNO (WA) PTY LTD  
 Project : WA\_0960\_PFASOMP



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                           | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|
| Container / Client Sample ID(s)                                                                                                                                                                                                                                         |                                                                                                                                                                                                                           |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| EP231P: PFAS Sums                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                           |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)<br>0960_QC303_211124,<br>0960_QC402_211124,                                                                                                                                                                                                     | 0960_QC401_211124,<br>0960_QC403_211124                                                                                                                                                                                   | 24-Nov-2021 | 03-Dec-2021              | 23-May-2022        | ✔          | 06-Dec-2021   | 23-May-2022      | ✔          |
| HDPE (no PTFE) (EP231X)<br>0960_MW148D_211124,<br>0960_MW012_211124,<br>0960_MW151_211124,<br>0960_QC116_211124,<br>0960_OTH134_211124,<br>0960_OTH129_211124,<br>0960_MW177_3.5-4_211124,<br>0960_MW178_9-9.5_211124,<br>0960_MW144_3-3.5_211124,<br>0960_QC302_211124 | 0960_MW148S_211124,<br>0960_QC115_211124,<br>0960_MW105_211124,<br>0060_OTH132_211124,<br>0960_MW175_5.5-6.0_211124,<br>0960_OTH103_211124,<br>0960_MW176_6-6.5_211124,<br>0960_MW135_6.4-7_211124,<br>0960_QC301_211124, | 24-Nov-2021 | 06-Dec-2021              | 23-May-2022        | ✔          | 06-Dec-2021   | 23-May-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                            |         | Count |         | Rate (%) |          | Quality Control Specification |                                |
|--------------------------------------------------------|---------|-------|---------|----------|----------|-------------------------------|--------------------------------|
| Analytical Methods                                     | Method  | QC    | Regular | Actual   | Expected |                               | Evaluation                     |
|                                                        |         |       |         |          |          |                               |                                |
| Laboratory Duplicates (DUP)                            |         |       |         |          |          |                               |                                |
| Alkalinity by PC Titrator                              | ED037-P | 2     | 20      | 10.00    | 10.00    | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 4     | 40      | 10.00    | 10.00    | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 2     | 16      | 12.50    | 10.00    | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 3     | 38      | 7.89     | 10.00    | ✗                             | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 4     | 38      | 10.53    | 10.00    | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Laboratory Control Samples (LCS)                       |         |       |         |          |          |                               |                                |
| Alkalinity by PC Titrator                              | ED037-P | 2     | 20      | 10.00    | 10.00    | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 4     | 40      | 10.00    | 10.00    | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 1     | 16      | 6.25     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 2     | 38      | 5.26     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 4     | 38      | 10.53    | 10.00    | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Method Blanks (MB)                                     |         |       |         |          |          |                               |                                |
| Alkalinity by PC Titrator                              | ED037-P | 1     | 20      | 5.00     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 2     | 40      | 5.00     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 1     | 16      | 6.25     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 2     | 38      | 5.26     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 2     | 38      | 5.26     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Matrix Spikes (MS)                                     |         |       |         |          |          |                               |                                |
| Chloride by Discrete Analyser                          | ED045G  | 2     | 40      | 5.00     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 38      | 2.63     | 5.00     | ✗                             | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 2     | 38      | 5.26     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |



## Brief Method Summaries

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

| Analytical Methods                                                 | Method       | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------------------|--------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alkalinity by PC Titrator                                          | ED037-P      | WATER  | In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                                                                                                                                                                                                                |
| Sulfate (Turbidimetric) as SO <sub>4</sub> 2- by Discrete Analyser | ED041G       | WATER  | In house: Referenced to APHA 4500-SO <sub>4</sub> . Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO <sub>4</sub> suspension is measured by a photometer and the SO <sub>4</sub> -2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                         |
| Chloride by Discrete Analyser                                      | ED045G       | WATER  | In house: Referenced to APHA 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA seal method 2 017-1-L                                                                                                                                                                                                                                                                                                                                      |
| Major Cations - Dissolved                                          | ED093F       | WATER  | In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                           |
| Ionic Balance by PCT DA and Turbi SO <sub>4</sub> DA               | * EN055 - PG | WATER  | In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS               | EP231X       | WATER  | In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements. |
| Preparation Methods                                                | Method       | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Solid Phase Extraction (SPE) for PFAS in water                     | ORG72        | WATER  | In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.                                                                                                                                                                                                |



# CHAIN OF CUSTODY

COC#: 30609

ALS Laboratory: EP Perth

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:

SAMPLER MOBILE:

/ ES2019CARBSD0002

## SAMPLE DETAILS

## ANALYSIS REQUIRED

| SAMPLE | NAME       | DESCRIPTION | DATE / TIME            | MATRIX | TOTAL BOTTLES        | ON HOLD | Sediments SEDIMENT | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|------------|-------------|------------------------|--------|----------------------|---------|--------------------|----------------------|------------------------|
| 001    | 0960_SS234 |             | 24/11/2021<br>08:26 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 002    | 0960_SS114 |             | 24/11/2021<br>09:44 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 003    | 0960_QC117 |             | 24/11/2021<br>09:45 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 004    | 0960_SS190 |             | 24/11/2021<br>10:28 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 005    | 0960_QC119 |             | 24/11/2021<br>10:28 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 006    | 0960_SS193 |             | 24/11/2021<br>10:47 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 007    | 0960_SS192 |             | 24/11/2021<br>10:51 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 008    | 0060_SD305 |             | 24/11/2021<br>12:11 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 009    | 0960_SD304 |             | 24/11/2021<br>12:26 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |



# CHAIN OF CUSTODY

COC#: 30609

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: MB\_DEF19009/Learmonth SED

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:

/ ES2019CARBSD0002

## LABORATORY USE ONLY (Circle)

Custody Seal intact?

Yes 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 | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|------------|-------------|------------------------|--------|----------------------|---------|--------------------|----------------------|------------------------|
| 010    | 0960_SD301 |             | 24/11/2021<br>12:59 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 011    | 0960_SD300 |             | 24/11/2021<br>01:37 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 012    | 0960_SD211 |             | 24/11/2021<br>02:31 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 013    | 0960_SS288 |             | 24/11/2021<br>03:05 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |





# CHAIN OF CUSTODY

COC#: 30609

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: MB\_DEF19009/Learmonth SED

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:  
/ ES2019CARBSD0002

## LABORATORY USE ONLY (Circle)

Custody Seal intact?

Yes 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    | 0960_SS234  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 002    | 0960_SS114  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 003    | 0960_QC117  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 004    | 0960_SS190  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 005    | 0960_QC119  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 006    | 0960_SS193  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 007    | 0960_SS192  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 008    | 0060_SD305  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 009    | 0960_SD304  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 010    | 0960_SD301  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 011    | 0960_SD300  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 012    | 0960_SD211  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 013    | 0960_SS288  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |

**CHAIN OF CUSTODY**

COC#: 30609

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: MB\_DEF19009/Learmonth SED

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:

/ ES2019CARBSD0002

**LABORATORY USE ONLY (Circle)**

Custody Seal intact?

Yes 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    | 0960_SS234  | HDPE Soil Jar | 200 mL | 00621019097719 | Grey | No       |        |
| 002    | 0960_SS114  | HDPE Soil Jar | 200 mL | 00621019078748 | Grey | No       |        |
| 003    | 0960_QC117  | HDPE Soil Jar | 200 mL | 00620719069299 | Grey | No       |        |
| 004    | 0960_SS190  | HDPE Soil Jar | 200 mL | 00621019107808 | Grey | No       |        |
| 005    | 0960_QC119  | HDPE Soil Jar | 200 mL | 00621019097735 | Grey | No       |        |
| 006    | 0960_SS193  | HDPE Soil Jar | 200 mL | 00621019097767 | Grey | No       |        |
| 007    | 0960_SS192  | HDPE Soil Jar | 200 mL | 00621019074638 | Grey | No       |        |
| 008    | 0060_SD305  | HDPE Soil Jar | 200 mL | 00621019097668 | Grey | No       |        |
| 009    | 0960_SD304  | HDPE Soil Jar | 200 mL | 00621019097687 | Grey | No       |        |
| 010    | 0960_SD301  | HDPE Soil Jar | 200 mL | 00620719063079 | Grey | No       |        |
| 011    | 0960_SD300  | HDPE Soil Jar | 200 mL | 00620719063170 | Grey | No       |        |
| 012    | 0960_SD211  | HDPE Soil Jar | 200 mL | 00621019074577 | Grey | No       |        |
| 013    | 0960_SS288  | HDPE Soil Jar | 200 mL | 00621019097744 | Grey | No       |        |

Total Bottle Count: ALS: 13, Non ALS: 0

## SAMPLE RECEIPT NOTIFICATION (SRN)

**Work Order : EP2114393**

|                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Client : <b>CARDNO (WA) PTY LTD</b></p> <p>Contact : [REDACTED]</p> <p>Address : 11 HARVEST TERRACE PO BOX 155<br/>WEST PERTH WA, AUSTRALIA 6006</p> <p>E-mail : [REDACTED]@cardno.com.au</p> <p>Telephone : ----</p> <p>Facsimile : ----</p> <p>Project : WA_0960_PFASOMP</p> <p>Order number : DEF19009/0960</p> <p>C-O-C number : 30609</p> <p>Site : DEF19009/Learmonth</p> <p>Sampler : [REDACTED]</p> | <p>Laboratory : Environmental Division Perth</p> <p>Contact : Customer Services EP</p> <p>Address : 26 Rigali Way Wangara WA Australia<br/>6065</p> <p>E-mail : ALSEnviro.Perth@alsglobal.com</p> <p>Telephone : +61-8-9406 1301</p> <p>Facsimile : +61-8-9406 1399</p> <p>Page : 1 of 2</p> <p>Quote number : ES2019CARBSD0002 (SY/139/19)</p> <p>QC Level : NEPM 2013 B3 &amp; ALS QC Standard</p> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Dates

|                                           |                                               |
|-------------------------------------------|-----------------------------------------------|
| Date Samples Received : 26-Nov-2021 09:55 | Issue Date : 26-Nov-2021                      |
| Client Requested Due Date : 08-Dec-2021   | Scheduled Reporting Date : <b>08-Dec-2021</b> |

### Delivery Details

|                             |                                              |
|-----------------------------|----------------------------------------------|
| Mode of Delivery : Carrier  | Security Seal : Not Available                |
| No. of coolers/boxes : 3    | Temperature : 24.8 - Ice present             |
| Receipt Detail : Ice Melted | No. of samples received / analysed : 13 / 13 |

### General Comments

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



## Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exists.

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: SOIL

| Laboratory sample ID | Sampling date / time | Sample ID         | SOIL - EA055-103 Moisture Content | SOIL - EP231X (solids) PFAS - Full Suite (28 analytes) |
|----------------------|----------------------|-------------------|-----------------------------------|--------------------------------------------------------|
| EP2114393-001        | 24-Nov-2021 08:26    | 0960_SS234_211124 | ✓                                 | ✓                                                      |
| EP2114393-002        | 24-Nov-2021 09:44    | 0960_SS114_211124 | ✓                                 | ✓                                                      |
| EP2114393-003        | 24-Nov-2021 09:45    | 0960_QC117_211124 | ✓                                 | ✓                                                      |
| EP2114393-004        | 24-Nov-2021 10:28    | 0960_SS190_211124 | ✓                                 | ✓                                                      |
| EP2114393-005        | 24-Nov-2021 10:28    | 0960_QC119_211124 | ✓                                 | ✓                                                      |
| EP2114393-006        | 24-Nov-2021 10:47    | 0960_SS193_211124 | ✓                                 | ✓                                                      |
| EP2114393-007        | 24-Nov-2021 10:51    | 0960_SS192_211124 | ✓                                 | ✓                                                      |
| EP2114393-008        | 24-Nov-2021 12:11    | 0060_SD305_211124 | ✓                                 | ✓                                                      |
| EP2114393-009        | 24-Nov-2021 12:26    | 0960_SD304_211124 | ✓                                 | ✓                                                      |
| EP2114393-010        | 24-Nov-2021 12:59    | 0960_SD301_211124 | ✓                                 | ✓                                                      |
| EP2114393-011        | 24-Nov-2021 13:37    | 0960_SD300_211124 | ✓                                 | ✓                                                      |
| EP2114393-012        | 24-Nov-2021 14:31    | 0960_SD211_211124 | ✓                                 | ✓                                                      |
| EP2114393-013        | 24-Nov-2021 15:05    | 0960_SS288_211124 | ✓                                 | ✓                                                      |

## Proactive Holding Time Report

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

## Requested Deliverables

|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------------------------------|
| <div> <div></div> <div></div> </div> <ul style="list-style-type: none"> <li>- A4 - AU Tax Invoice (INV)</li> </ul>                                                                                                                                                                                                                                                                                                                                            | Email | <div></div> cardno.com.au    |
| <b>DERP LAB REPORTS</b>                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |                              |
| <ul style="list-style-type: none"> <li>- EDI Format - ESDAT (ESDAT)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                | Email | derp.labreports@esdat.com.au |
| <div> <div></div> <div></div> </div> <ul style="list-style-type: none"> <li>- *AU Certificate of Analysis - NATA (COA)</li> <li>- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)</li> <li>- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)</li> <li>- A4 - AU Sample Receipt Notification - Environmental HT (SRN)</li> <li>- Chain of Custody (CoC) (COC)</li> <li>- EDI Format - ESDAT (ESDAT)</li> <li>- EDI Format - XTab (XTAB)</li> </ul> | Email | <div></div> cardno.com.au    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Email | <div></div> cardno.com.au    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Email | <div></div> cardno.com.au    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Email | <div></div> cardno.com.au    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Email | <div></div> cardno.com.au    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Email | <div></div> cardno.com.au    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Email | <div></div> cardno.com.au    |
| <b>Perth</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |                              |
| <ul style="list-style-type: none"> <li>- A4 - AU Tax Invoice (INV)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                 | Email | perth@cardno.com.au          |



## CERTIFICATE OF ANALYSIS

**Work Order** : **EP2114393**  
**Client** : **CARDNO (WA) PTY LTD**  
**Contact** : [REDACTED]  
**Address** : 11 HARVEST TERRACE PO BOX 155  
 WEST PERTH WA, AUSTRALIA 6006  
**Telephone** : ----  
**Project** : WA\_0960\_PFASOMP  
**Order number** : DEF19009/0960  
**C-O-C number** : 30609  
**Sampler** : [REDACTED]  
**Site** : DEF19009/Learmonth  
**Quote number** : SY/139/19  
**No. of samples received** : 13  
**No. of samples analysed** : 13

**Page** : 1 of 9  
**Laboratory** : Environmental Division Perth  
**Contact** : Customer Services EP  
**Address** : 26 Rigali Way Wangara WA Australia 6065  
**Telephone** : +61-8-9406 1301  
**Date Samples Received** : 26-Nov-2021 09:55  
**Date Analysis Commenced** : 03-Dec-2021  
**Issue Date** : 07-Dec-2021 11:00



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>      |
|------------------------------------------------------------------------|------------------|------------------------------------|
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator | Sydney Inorganics, Smithfield, NSW |
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator | Sydney Organics, Smithfield, NSW   |



## 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.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- 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

|                                                    |            |        |       | 0960_SS234_211124 | 0960_SS114_211124 | 0960_QC117_211124 | 0960_SS190_211124 | 0960_QC119_211124 |
|----------------------------------------------------|------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                               |            |        |       | 24-Nov-2021 08:26 | 24-Nov-2021 09:44 | 24-Nov-2021 09:45 | 24-Nov-2021 10:28 | 24-Nov-2021 10:28 |
| Compound                                           | CAS Number | LOR    | Unit  | EP2114393-001     | EP2114393-002     | EP2114393-003     | EP2114393-004     | EP2114393-005     |
|                                                    |            |        |       | Result            | Result            | Result            | Result            | Result            |
| <b>EA055: Moisture Content (Dried @ 105-110°C)</b> |            |        |       |                   |                   |                   |                   |                   |
| Moisture Content                                   | ----       | 0.1    | %     | 7.3               | 7.4               | 7.6               | 25.2              | 25.4              |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>       |            |        |       |                   |                   |                   |                   |                   |
| 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 | 0.0010            | <0.0002           | <0.0002           | 0.0003            | 0.0003            |
| 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 | 0.0443            | 0.0053            | 0.0050            | 0.0110            | 0.0143            |
| Perfluorodecane sulfonic acid (PFDS)               | 335-77-3   | 0.0002 | mg/kg | 0.0004            | 0.0007            | 0.0006            | <0.0002           | 0.0006            |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>     |            |        |       |                   |                   |                   |                   |                   |
| 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 | 0.0008            | <0.0002           | <0.0002           | <0.0002           | <0.0002           |
| Perfluorononanoic acid (PFNA)                      | 375-95-1   | 0.0002 | mg/kg | 0.0006            | <0.0002           | <0.0002           | <0.0002           | <0.0002           |
| Perfluorodecanoic acid (PFDA)                      | 335-76-2   | 0.0002 | mg/kg | 0.0008            | <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           |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>         |            |        |       |                   |                   |                   |                   |                   |
| 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<br>(Matrix: SOIL)                    |                    |        |       | Sample ID | 0960_SS234_211124 | 0960_SS114_211124 | 0960_QC117_211124 | 0960_SS190_211124 | 0960_QC119_211124 |
|-----------------------------------------------------------|--------------------|--------|-------|-----------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                      |                    |        |       |           | 24-Nov-2021 08:26 | 24-Nov-2021 09:44 | 24-Nov-2021 09:45 | 24-Nov-2021 10:28 | 24-Nov-2021 10:28 |
| Compound                                                  | CAS Number         | LOR    | Unit  |           | EP2114393-001     | EP2114393-002     | EP2114393-003     | EP2114393-004     | EP2114393-005     |
|                                                           |                    |        |       | Result    | Result            | Result            | Result            | Result            | Result            |
| <b>EP231C: Perfluoroalkyl Sulfonamides - Continued</b>    |                    |        |       |           |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>         |                    |        |       |           |                   |                   |                   |                   |                   |
| 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 | 0.0012    | <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           |
| <b>EP231P: PFAS Sums</b>                                  |                    |        |       |           |                   |                   |                   |                   |                   |
| Sum of PFAS                                               | ----               | 0.0002 | mg/kg | 0.0491    | 0.0060            | 0.0056            | 0.0113            | 0.0152            |                   |
| Sum of PFHxS and PFOS                                     | 355-46-4/1763-23-1 | 0.0002 | mg/kg | 0.0453    | 0.0053            | 0.0050            | 0.0113            | 0.0146            |                   |
| Sum of PFAS (WA DER List)                                 | ----               | 0.0002 | mg/kg | 0.0473    | 0.0053            | 0.0050            | 0.0113            | 0.0146            |                   |
| <b>EP231S: PFAS Surrogate</b>                             |                    |        |       |           |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                 | ----               | 0.0002 | %     | 85.5      | 87.0              | 102               | 90.5              | 102               |                   |
| 13C8-PFOA                                                 | ----               | 0.0002 | %     | 108       | 96.5              | 96.5              | 97.5              | 89.5              |                   |





## Analytical Results

Sub-Matrix: SEDIMENT  
 (Matrix: SOIL)

Sample ID

|                                                    |            |        |       | 0960_SS193_211124 | 0960_SS192_211124 | 0060_SD305_211124 | 0960_SD304_211124 | 0960_SD301_211124 |
|----------------------------------------------------|------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                               |            |        |       | 24-Nov-2021 10:47 | 24-Nov-2021 10:51 | 24-Nov-2021 12:11 | 24-Nov-2021 12:26 | 24-Nov-2021 12:59 |
| Compound                                           | CAS Number | LOR    | Unit  | EP2114393-006     | EP2114393-007     | EP2114393-008     | EP2114393-009     | EP2114393-010     |
|                                                    |            |        |       | Result            | Result            | Result            | Result            | Result            |
| <b>EA055: Moisture Content (Dried @ 105-110°C)</b> |            |        |       |                   |                   |                   |                   |                   |
| Moisture Content                                   | ----       | 0.1    | %     | 26.6              | 1.9               | 22.7              | 29.4              | 35.6              |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>       |            |        |       |                   |                   |                   |                   |                   |
| Perfluorobutane sulfonic acid (PFBS)               | 375-73-5   | 0.0002 | mg/kg | <0.0002           | <0.0002           | <0.0002           | <0.0002           | <0.0002           |
| Perfluoropentane sulfonic acid (PFPeS)             | 2706-91-4  | 0.0002 | mg/kg | <0.0002           | <0.0002           | <0.0002           | <0.0002           | <0.0002           |
| Perfluorohexane sulfonic acid (PFHxS)              | 355-46-4   | 0.0002 | mg/kg | <0.0002           | <0.0002           | <0.0002           | <0.0002           | <0.0002           |
| Perfluoroheptane sulfonic acid (PFHpS)             | 375-92-8   | 0.0002 | mg/kg | <0.0002           | <0.0002           | <0.0002           | <0.0002           | <0.0002           |
| Perfluorooctane sulfonic acid (PFOS)               | 1763-23-1  | 0.0002 | mg/kg | 0.0002            | <0.0002           | <0.0002           | <0.0002           | 0.0002            |
| Perfluorodecane sulfonic acid (PFDS)               | 335-77-3   | 0.0002 | mg/kg | <0.0002           | <0.0002           | <0.0002           | <0.0002           | <0.0002           |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>     |            |        |       |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>         |            |        |       |                   |                   |                   |                   |                   |
| 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<br>(Matrix: SOIL)                    |                    |        |       | Sample ID | 0960_SS193_211124 | 0960_SS192_211124 | 0060_SD305_211124 | 0960_SD304_211124 | 0960_SD301_211124 |
|-----------------------------------------------------------|--------------------|--------|-------|-----------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                      |                    |        |       |           | 24-Nov-2021 10:47 | 24-Nov-2021 10:51 | 24-Nov-2021 12:11 | 24-Nov-2021 12:26 | 24-Nov-2021 12:59 |
| Compound                                                  | CAS Number         | LOR    | Unit  |           | EP2114393-006     | EP2114393-007     | EP2114393-008     | EP2114393-009     | EP2114393-010     |
|                                                           |                    |        |       | Result    | Result            | Result            | Result            | Result            | Result            |
| <b>EP231C: Perfluoroalkyl Sulfonamides - Continued</b>    |                    |        |       |           |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>         |                    |        |       |           |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231P: PFAS Sums</b>                                  |                    |        |       |           |                   |                   |                   |                   |                   |
| Sum of PFAS                                               | ----               | 0.0002 | mg/kg | 0.0002    | <0.0002           | <0.0002           | <0.0002           | <0.0002           | 0.0002            |
| Sum of PFHxS and PFOS                                     | 355-46-4/1763-23-1 | 0.0002 | mg/kg | 0.0002    | <0.0002           | <0.0002           | <0.0002           | <0.0002           | 0.0002            |
| Sum of PFAS (WA DER List)                                 | ----               | 0.0002 | mg/kg | 0.0002    | <0.0002           | <0.0002           | <0.0002           | <0.0002           | 0.0002            |
| <b>EP231S: PFAS Surrogate</b>                             |                    |        |       |           |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                 | ----               | 0.0002 | %     | 93.5      | 85.5              | 100               | 97.5              | 93.0              |                   |
| 13C8-PFOA                                                 | ----               | 0.0002 | %     | 94.5      | 105               | 99.0              | 92.5              | 88.5              |                   |



## Analytical Results

Sub-Matrix: SEDIMENT  
 (Matrix: SOIL)

Sample ID

|                                                    |            |        |       | 0960_SD300_211124 | 0960_SD211_211124 | 0960_SS288_211124 | ----  | ----  |
|----------------------------------------------------|------------|--------|-------|-------------------|-------------------|-------------------|-------|-------|
| Sampling date / time                               |            |        |       | 24-Nov-2021 13:37 | 24-Nov-2021 14:31 | 24-Nov-2021 15:05 | ----  | ----  |
| Compound                                           | CAS Number | LOR    | Unit  | EP2114393-011     | EP2114393-012     | EP2114393-013     | ----- | ----- |
|                                                    |            |        |       | Result            | Result            | Result            | ----  | ----  |
| <b>EA055: Moisture Content (Dried @ 105-110°C)</b> |            |        |       |                   |                   |                   |       |       |
| Moisture Content                                   | ----       | 0.1    | %     | <b>34.2</b>       | <b>33.9</b>       | <b>0.6</b>        | ----  | ----  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>       |            |        |       |                   |                   |                   |       |       |
| 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 | <b>0.0004</b>     | <b>0.0007</b>     | <b>0.0007</b>     | ----  | ----  |
| Perfluorodecane sulfonic acid (PFDS)               | 335-77-3   | 0.0002 | mg/kg | <0.0002           | <0.0002           | <0.0002           | ----  | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>     |            |        |       |                   |                   |                   |       |       |
| 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           | ----  | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>         |            |        |       |                   |                   |                   |       |       |
| 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<br>(Matrix: SOIL)                    |                    |        |       | Sample ID | 0960_SD300_211124 | 0960_SD211_211124 | 0960_SS288_211124 | ----  | ----  |
|-----------------------------------------------------------|--------------------|--------|-------|-----------|-------------------|-------------------|-------------------|-------|-------|
| Sampling date / time                                      |                    |        |       |           | 24-Nov-2021 13:37 | 24-Nov-2021 14:31 | 24-Nov-2021 15:05 | ----  | ----  |
| Compound                                                  | CAS Number         | LOR    | Unit  |           | EP2114393-011     | EP2114393-012     | EP2114393-013     | ----- | ----- |
|                                                           |                    |        |       | Result    | Result            | Result            | Result            | ----  | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides - Continued</b>    |                    |        |       |           |                   |                   |                   |       |       |
| 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           | ----  | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>         |                    |        |       |           |                   |                   |                   |       |       |
| 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           | ----  | ----  |
| <b>EP231P: PFAS Sums</b>                                  |                    |        |       |           |                   |                   |                   |       |       |
| Sum of PFAS                                               | ----               | 0.0002 | mg/kg | 0.0004    | 0.0007            | 0.0007            | 0.0007            | ----  | ----  |
| Sum of PFHxS and PFOS                                     | 355-46-4/1763-23-1 | 0.0002 | mg/kg | 0.0004    | 0.0007            | 0.0007            | 0.0007            | ----  | ----  |
| Sum of PFAS (WA DER List)                                 | ----               | 0.0002 | mg/kg | 0.0004    | 0.0007            | 0.0007            | 0.0007            | ----  | ----  |
| <b>EP231S: PFAS Surrogate</b>                             |                    |        |       |           |                   |                   |                   |       |       |
| 13C4-PFOS                                                 | ----               | 0.0002 | %     | 88.5      | 77.5              | 110               | 110               | ----  | ----  |
| 13C8-PFOA                                                 | ----               | 0.0002 | %     | 94.5      | 84.5              | 108               | 108               | ----  | ----  |





## Surrogate Control Limits

| Sub-Matrix: <b>SEDIMENT</b>   |            | Recovery Limits (%) |      |
|-------------------------------|------------|---------------------|------|
| Compound                      | CAS Number | Low                 | High |
| <b>EP231S: PFAS Surrogate</b> |            |                     |      |
| <b>13C4-PFOS</b>              | ----       | 60                  | 120  |
| <b>13C8-PFOA</b>              | ----       | 60                  | 120  |

## Inter-Laboratory Testing

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

## QUALITY CONTROL REPORT

|                                |                                                                          |                                |                                                  |
|--------------------------------|--------------------------------------------------------------------------|--------------------------------|--------------------------------------------------|
| <b>Work Order</b>              | <b>: EP2114393</b>                                                       | <b>Page</b>                    | <b>: 1 of 7</b>                                  |
| <b>Client</b>                  | <b>: CARDNO (WA) PTY LTD</b>                                             | <b>Laboratory</b>              | <b>: Environmental Division Perth</b>            |
| <b>Contact</b>                 | <b>: [REDACTED]</b>                                                      | <b>Contact</b>                 | <b>: Customer Services EP</b>                    |
| <b>Address</b>                 | <b>: 11 HARVEST TERRACE PO BOX 155<br/>WEST PERTH WA, AUSTRALIA 6006</b> | <b>Address</b>                 | <b>: 26 Rigali Way Wangara WA Australia 6065</b> |
| <b>Telephone</b>               | <b>: ----</b>                                                            | <b>Telephone</b>               | <b>: +61-8-9406 1301</b>                         |
| <b>Project</b>                 | <b>: WA_0960_PFASOMP</b>                                                 | <b>Date Samples Received</b>   | <b>: 26-Nov-2021</b>                             |
| <b>Order number</b>            | <b>: DEF19009/0960</b>                                                   | <b>Date Analysis Commenced</b> | <b>: 03-Dec-2021</b>                             |
| <b>C-O-C number</b>            | <b>: 30609</b>                                                           | <b>Issue Date</b>              | <b>: 07-Dec-2021</b>                             |
| <b>Sampler</b>                 | <b>: [REDACTED]</b>                                                      |                                |                                                  |
| <b>Site</b>                    | <b>: DEF19009/Learmonth</b>                                              |                                |                                                  |
| <b>Quote number</b>            | <b>: SY/139/19</b>                                                       |                                |                                                  |
| <b>No. of samples received</b> | <b>: 13</b>                                                              |                                |                                                  |
| <b>No. of samples analysed</b> | <b>: 13</b>                                                              |                                |                                                  |



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]  | LCMS Coordinator | Sydney Inorganics, Smithfield, NSW |
| [REDACTED]  | LCMS Coordinator | Sydney Organics, Smithfield, NSW   |



## 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**

| 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: 4056870) |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2114393-003                                                 | 0960_QC117_211124 | EA055: Moisture Content                        | ----       | 0.1                               | %     | 7.6             | 7.4              | 2.8     | 0% - 20%           |
| EP2114396-001                                                 | Anonymous         | EA055: Moisture Content                        | ----       | 0.1                               | %     | 3.7             | 3.6              | 0.0     | 0% - 20%           |
| EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4052757)       |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2114393-001                                                 | 0960_SS234_211124 | 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 | 0.0010          | 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 | 0.0443          | 0.0470           | 5.9     | 0% - 20%           |
|                                                               |                   | EP231X: Perfluorodecane sulfonic acid (PFDS)   | 335-77-3   | 0.0002                            | mg/kg | 0.0004          | 0.0004           | 0.0     | No Limit           |
| EP2114393-011                                                 | 0960_SD300_211124 | 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          | 0.0005           | 0.0     | No Limit           |
|                                                               |                   | EP231X: Perfluorodecane sulfonic acid (PFDS)   | 335-77-3   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
| EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4052757)     |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2114393-001                                                 | 0960_SS234_211124 | 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 | 0.0008          | 0.0008           | 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 | 0.0008          | 0.0008           | 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: 4052757) - continued |                   |                                                                   |            |                                   |       |                 |                  |         |                    |
| EP2114393-001                                                         | 0960_SS234_211124 | 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           |
| EP2114393-011                                                         | 0960_SD300_211124 | 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: 4052757)                 |                   |                                                                   |            |                                   |       |                 |                  |         |                    |
| EP2114393-001                                                         | 0960_SS234_211124 | 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           |
| EP2114393-011                                                         | 0960_SD300_211124 | 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           |



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 Work Order : EP2114393  
 Client : CARDNO (WA) PTY LTD  
 Project : WA\_0960\_PFASOMP



| Sub-Matrix: <b>SOIL</b>                                             |                   |                                                     |             | Laboratory Duplicate (DUP) Report |       |                 |                  |         |                    |
|---------------------------------------------------------------------|-------------------|-----------------------------------------------------|-------------|-----------------------------------|-------|-----------------|------------------|---------|--------------------|
| Laboratory sample ID                                                | Sample ID         | Method: Compound                                    | CAS Number  | LOR                               | Unit  | Original Result | Duplicate Result | RPD (%) | Acceptable RPD (%) |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4052757)</b> |                   |                                                     |             |                                   |       |                 |                  |         |                    |
| EP2114393-001                                                       | 0960_SS234_211124 | 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 | 0.0012          | 0.0011           | 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           |
| EP2114393-011                                                       | 0960_SD300_211124 | 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           |



## 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**

| Sub-Matrix: SOIL                                                  |             |        |       | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |     |
|-------------------------------------------------------------------|-------------|--------|-------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|-----|
|                                                                   |             |        |       |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |     |
| Method: Compound                                                  | CAS Number  | LOR    | Unit  | Result                      |                                       |                           |                                   |     |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4052757)            |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: Perfluorobutane sulfonic acid (PFBS)                      | 375-73-5    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 102                       | 72.0                              | 128 |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)                    | 2706-91-4   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 107                       | 73.0                              | 123 |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)                     | 355-46-4    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 98.4                      | 67.0                              | 130 |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)                    | 375-92-8    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 89.2                      | 70.0                              | 132 |
| EP231X: Perfluorooctane sulfonic acid (PFOS)                      | 1763-23-1   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 97.2                      | 68.0                              | 136 |
| EP231X: Perfluorodecane sulfonic acid (PFDS)                      | 335-77-3    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 97.6                      | 59.0                              | 134 |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4052757)          |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: Perfluorobutanoic acid (PFBA)                             | 375-22-4    | 0.001  | mg/kg | <0.001                      | 0.00625 mg/kg                         | 116                       | 71.0                              | 135 |
| EP231X: Perfluoropentanoic acid (PFPeA)                           | 2706-90-3   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 101                       | 69.0                              | 132 |
| EP231X: Perfluorohexanoic acid (PFHxA)                            | 307-24-4    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 104                       | 70.0                              | 132 |
| EP231X: Perfluoroheptanoic acid (PFHpA)                           | 375-85-9    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 113                       | 71.0                              | 131 |
| EP231X: Perfluorooctanoic acid (PFOA)                             | 335-67-1    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 108                       | 69.0                              | 133 |
| EP231X: Perfluorononanoic acid (PFNA)                             | 375-95-1    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 96.8                      | 72.0                              | 129 |
| EP231X: Perfluorodecanoic acid (PFDA)                             | 335-76-2    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 107                       | 69.0                              | 133 |
| EP231X: Perfluoroundecanoic acid (PFUnDA)                         | 2058-94-8   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 89.6                      | 64.0                              | 136 |
| EP231X: Perfluorododecanoic acid (PFDoDA)                         | 307-55-1    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 109                       | 69.0                              | 135 |
| EP231X: Perfluorotridecanoic acid (PFTriDA)                       | 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                         | 116                       | 69.0                              | 133 |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4052757)              |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 100                       | 67.0                              | 137 |
| EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 104                       | 71.6                              | 129 |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 97.1                      | 69.8                              | 131 |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 101                       | 68.7                              | 130 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 114                       | 65.1                              | 134 |
| 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                         | 84.0                      | 61.0                              | 139 |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4052757)       |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.0005 | mg/kg | <0.0005                     | 0.00125 mg/kg                         | 127                       | 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                         | 118                       | 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                         | 96.8                      | 65.0                              | 137 |



| Sub-Matrix: SOIL                                                        |             |        |       | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |               |                    |                       |      |
|-------------------------------------------------------------------------|-------------|--------|-------|-----------------------------|---------------------------------------|---------------|--------------------|-----------------------|------|
| Method: Compound                                                        | CAS Number  | LOR    | Unit  |                             | Result                                | Spike         | Spike Recovery (%) | Acceptable Limits (%) |      |
|                                                                         |             |        |       |                             |                                       | Concentration | LCS                | Low                   | High |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4052757) - continued |             |        |       |                             |                                       |               |                    |                       |      |
| EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)                     | 120226-60-0 | 0.0005 | mg/kg | <0.0005                     | 0.00125 mg/kg                         | 70.8          | 69.2               | 143                   |      |

## 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                                         |                   |                                                              |            | 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: 4052757)   |                   |                                                              |            |                          |                  |                       |      |
| EP2114393-001                                            | 0960_SS234_211124 | EP231X: Perfluorobutane sulfonic acid (PFBS)                 | 375-73-5   | 0.00125 mg/kg            | 91.2             | 72.0                  | 128  |
|                                                          |                   | EP231X: Perfluoropentane sulfonic acid (PFPeS)               | 2706-91-4  | 0.00125 mg/kg            | 101              | 73.0                  | 123  |
|                                                          |                   | EP231X: Perfluorohexane sulfonic acid (PFHxS)                | 355-46-4   | 0.00125 mg/kg            | 85.6             | 67.0                  | 130  |
|                                                          |                   | EP231X: Perfluoroheptane sulfonic acid (PFHpS)               | 375-92-8   | 0.00125 mg/kg            | 95.6             | 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            | 61.2             | 59.0                  | 134  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4052757) |                   |                                                              |            |                          |                  |                       |      |
| EP2114393-001                                            | 0960_SS234_211124 | EP231X: Perfluorobutanoic acid (PFBA)                        | 375-22-4   | 0.00625 mg/kg            | 111              | 71.0                  | 135  |
|                                                          |                   | EP231X: Perfluoropentanoic acid (PFPeA)                      | 2706-90-3  | 0.00125 mg/kg            | 102              | 69.0                  | 132  |
|                                                          |                   | EP231X: Perfluorohexanoic acid (PFHxA)                       | 307-24-4   | 0.00125 mg/kg            | 91.6             | 70.0                  | 132  |
|                                                          |                   | EP231X: Perfluoroheptanoic acid (PFHpA)                      | 375-85-9   | 0.00125 mg/kg            | 108              | 71.0                  | 131  |
|                                                          |                   | EP231X: Perfluorooctanoic acid (PFOA)                        | 335-67-1   | 0.00125 mg/kg            | 93.6             | 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            | 102              | 69.0                  | 133  |
|                                                          |                   | EP231X: Perfluoroundecanoic acid (PFUnDA)                    | 2058-94-8  | 0.00125 mg/kg            | 82.4             | 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            | 96.4             | 66.0                  | 139  |
|                                                          |                   | EP231X: Perfluorotetradecanoic acid (PFTeDA)                 | 376-06-7   | 0.00312 mg/kg            | 111              | 69.0                  | 133  |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4052757)     |                   |                                                              |            |                          |                  |                       |      |
| EP2114393-001                                            | 0960_SS234_211124 | EP231X: Perfluorooctane sulfonamide (FOSA)                   | 754-91-6   | 0.00125 mg/kg            | 112              | 67.0                  | 137  |
|                                                          |                   | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)        | 31506-32-8 | 0.00312 mg/kg            | 101              | 71.6                  | 129  |
|                                                          |                   | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)         | 4151-50-2  | 0.00312 mg/kg            | 97.4             | 69.8                  | 131  |
|                                                          |                   | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE) | 24448-09-7 | 0.00312 mg/kg            | 94.6             | 68.7                  | 130  |
|                                                          |                   | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)  | 1691-99-2  | 0.00312 mg/kg            | 103              | 65.1                  | 134  |

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 Work Order : EP2114393  
 Client : CARDNO (WA) PTY LTD  
 Project : WA\_0960\_PFASOMP



Sub-Matrix: **SOIL**

| 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: 4052757) - continued |                   |                                                                   |             |                          |                  |                       |      |
| EP2114393-001                                                    | 0960_SS234_211124 | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9   | 0.00125 mg/kg            | 108              | 63.0                  | 144  |
|                                                                  |                   | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.00125 mg/kg            | 101              | 61.0                  | 139  |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4052757)      |                   |                                                                   |             |                          |                  |                       |      |
| EP2114393-001                                                    | 0960_SS234_211124 | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.00125 mg/kg            | 124              | 62.0                  | 145  |
|                                                                  |                   | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 27619-97-2  | 0.00125 mg/kg            | 115              | 64.0                  | 140  |
|                                                                  |                   | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | 39108-34-4  | 0.00125 mg/kg            | 78.0             | 65.0                  | 137  |
|                                                                  |                   | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | 120226-60-0 | 0.00125 mg/kg            | 75.6             | 69.2                  | 143  |



## QA/QC Compliance Assessment to assist with Quality Review

|              |                       |                         |                                |
|--------------|-----------------------|-------------------------|--------------------------------|
| Work Order   | : EP2114393           | Page                    | : 1 of 5                       |
| Client       | : CARDNO (WA) PTY LTD | Laboratory              | : Environmental Division Perth |
| Contact      | : [REDACTED]          | Telephone               | : +61-8-9406 1301              |
| Project      | : WA_0960_PFASOMP     | Date Samples Received   | : 26-Nov-2021                  |
| Site         | : DEF19009/Learmonth  | Issue Date              | : 07-Dec-2021                  |
| Sampler      | : [REDACTED]          | No. of samples received | : 13                           |
| Order number | : DEF19009/0960       | No. of samples analysed | : 13                           |

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

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

### Summary of Outliers

#### Outliers : Quality Control Samples

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

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- 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.**

*Duplicates. Method Blanks. Laboratory Control Samples and Matrix Spikes*

| Compound Group Name                   | Laboratory Sample ID | Client Sample ID  | Analyte                              | CAS Number | Data           | Limits | Comment                                                                               |
|---------------------------------------|----------------------|-------------------|--------------------------------------|------------|----------------|--------|---------------------------------------------------------------------------------------|
| <b>Matrix Spike (MS) Recoveries</b>   |                      |                   |                                      |            |                |        |                                                                                       |
| EP231A: Perfluoroalkyl Sulfonic Acids | EP2114393--001       | 0960_SS234_211124 | Perfluorooctane sulfonic acid (PFOS) | 1763-23-1  | Not Determined | ----   | MS recovery not determined, background level greater than or equal to 4x spike level. |

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.

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time

| Method                                                                                                                                                                          | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|
| Container / Client Sample ID(s)                                                                                                                                                 |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| EA055: Moisture Content (Dried @ 105-110°C)                                                                                                                                     |             |                          |                    |            |               |                  |            |
| HDPE Soil Jar (EA055)<br>0960_SS234_211124,<br>0960_QC117_211124,<br>0960_QC119_211124,<br>0960_SS192_211124,<br>0960_SD304_211124,<br>0960_SD300_211124,<br>0960_SS288_211124  | 24-Nov-2021 | ----                     | ----               | ----       | 06-Dec-2021   | 08-Dec-2021      | ✔          |
| EP231A: Perfluoroalkyl Sulfonic Acids                                                                                                                                           |             |                          |                    |            |               |                  |            |
| HDPE Soil Jar (EP231X)<br>0960_SS234_211124,<br>0960_QC117_211124,<br>0960_QC119_211124,<br>0960_SS192_211124,<br>0960_SD304_211124,<br>0960_SD300_211124,<br>0960_SS288_211124 | 24-Nov-2021 | 03-Dec-2021              | 23-May-2022        | ✔          | 06-Dec-2021   | 12-Jan-2022      | ✔          |

Page : 3 of 5  
 Work Order : EP2114393  
 Client : CARDNO (WA) PTY LTD  
 Project : WA\_0960\_PFASOMP



Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                     |                    | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |
|--------------------------------------------|--------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|
| Container / Client Sample ID(s)            |                    |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| EP231B: Perfluoroalkyl Carboxylic Acids    |                    |             |                          |                    |            |               |                  |            |
| HDPE Soil Jar (EP231X)                     |                    |             |                          |                    |            |               |                  |            |
| 0960_SS234_211124,                         | 0960_SS114_211124, | 24-Nov-2021 | 03-Dec-2021              | 23-May-2022        | ✔          | 06-Dec-2021   | 12-Jan-2022      | ✔          |
| 0960_QC117_211124,                         | 0960_SS190_211124, |             |                          |                    |            |               |                  |            |
| 0960_QC119_211124,                         | 0960_SS193_211124, |             |                          |                    |            |               |                  |            |
| 0960_SS192_211124,                         | 0060_SD305_211124, |             |                          |                    |            |               |                  |            |
| 0960_SD304_211124,                         | 0960_SD301_211124, |             |                          |                    |            |               |                  |            |
| 0960_SD300_211124,                         | 0960_SD211_211124, |             |                          |                    |            |               |                  |            |
| 0960_SS288_211124                          |                    |             |                          |                    |            |               |                  |            |
| EP231C: Perfluoroalkyl Sulfonamides        |                    |             |                          |                    |            |               |                  |            |
| HDPE Soil Jar (EP231X)                     |                    |             |                          |                    |            |               |                  |            |
| 0960_SS234_211124,                         | 0960_SS114_211124, | 24-Nov-2021 | 03-Dec-2021              | 23-May-2022        | ✔          | 06-Dec-2021   | 12-Jan-2022      | ✔          |
| 0960_QC117_211124,                         | 0960_SS190_211124, |             |                          |                    |            |               |                  |            |
| 0960_QC119_211124,                         | 0960_SS193_211124, |             |                          |                    |            |               |                  |            |
| 0960_SS192_211124,                         | 0060_SD305_211124, |             |                          |                    |            |               |                  |            |
| 0960_SD304_211124,                         | 0960_SD301_211124, |             |                          |                    |            |               |                  |            |
| 0960_SD300_211124,                         | 0960_SD211_211124, |             |                          |                    |            |               |                  |            |
| 0960_SS288_211124                          |                    |             |                          |                    |            |               |                  |            |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids |                    |             |                          |                    |            |               |                  |            |
| HDPE Soil Jar (EP231X)                     |                    |             |                          |                    |            |               |                  |            |
| 0960_SS234_211124,                         | 0960_SS114_211124, | 24-Nov-2021 | 03-Dec-2021              | 23-May-2022        | ✔          | 06-Dec-2021   | 12-Jan-2022      | ✔          |
| 0960_QC117_211124,                         | 0960_SS190_211124, |             |                          |                    |            |               |                  |            |
| 0960_QC119_211124,                         | 0960_SS193_211124, |             |                          |                    |            |               |                  |            |
| 0960_SS192_211124,                         | 0060_SD305_211124, |             |                          |                    |            |               |                  |            |
| 0960_SD304_211124,                         | 0960_SD301_211124, |             |                          |                    |            |               |                  |            |
| 0960_SD300_211124,                         | 0960_SD211_211124, |             |                          |                    |            |               |                  |            |
| 0960_SS288_211124                          |                    |             |                          |                    |            |               |                  |            |
| EP231P: PFAS Sums                          |                    |             |                          |                    |            |               |                  |            |
| HDPE Soil Jar (EP231X)                     |                    |             |                          |                    |            |               |                  |            |
| 0960_SS234_211124,                         | 0960_SS114_211124, | 24-Nov-2021 | 03-Dec-2021              | 23-May-2022        | ✔          | 06-Dec-2021   | 12-Jan-2022      | ✔          |
| 0960_QC117_211124,                         | 0960_SS190_211124, |             |                          |                    |            |               |                  |            |
| 0960_QC119_211124,                         | 0960_SS193_211124, |             |                          |                    |            |               |                  |            |
| 0960_SS192_211124,                         | 0060_SD305_211124, |             |                          |                    |            |               |                  |            |
| 0960_SD304_211124,                         | 0960_SD301_211124, |             |                          |                    |            |               |                  |            |
| 0960_SD300_211124,                         | 0960_SD211_211124, |             |                          |                    |            |               |                  |            |
| 0960_SS288_211124                          |                    |             |                          |                    |            |               |                  |            |



## Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

| Quality Control Sample Type                          |        | Count |         | Rate (%) |          |            | Quality Control Specification  |
|------------------------------------------------------|--------|-------|---------|----------|----------|------------|--------------------------------|
| Analytical Methods                                   | Method | QC    | Regular | Actual   | Expected | Evaluation |                                |
| Laboratory Duplicates (DUP)                          |        |       |         |          |          |            |                                |
| Moisture Content                                     | EA055  | 2     | 20      | 10.00    | 10.00    | ✔          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 2     | 20      | 10.00    | 10.00    | ✔          | NEPM 2013 B3 & ALS QC Standard |
| Laboratory Control Samples (LCS)                     |        |       |         |          |          |            |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 1     | 20      | 5.00     | 5.00     | ✔          | NEPM 2013 B3 & ALS QC Standard |
| Method Blanks (MB)                                   |        |       |         |          |          |            |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 1     | 20      | 5.00     | 5.00     | ✔          | NEPM 2013 B3 & ALS QC Standard |
| Matrix Spikes (MS)                                   |        |       |         |          |          |            |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 1     | 20      | 5.00     | 5.00     | ✔          | NEPM 2013 B3 & ALS QC Standard |





## Brief Method Summaries

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

| <i>Analytical Methods</i>                            | <i>Method</i> | <i>Matrix</i> | <i>Method Descriptions</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------------------------------|---------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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. |
| <i>Preparation Methods</i>                           | <i>Method</i> | <i>Matrix</i> | <i>Method Descriptions</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| QuEChERS Extraction of Solids                        | ORG71         | SOIL          | In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.                                                                                                                                                                                                                                   |



# CHAIN OF CUSTODY

ALS COC#: 30620

ALS Laboratory: EP Perth

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:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: CG - DEF19009/Learmonth GW

ORDER NO: DEF19009/0960

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

SAMPLER MOBILE:

/ ES2019CARBSD0002

## SAMPLE DETAILS

## ANALYSIS REQUIRED

| SAMPLE | NAME                      | DESCRIPTION | DATE / TIME         | MATRIX | TOTAL BOTTLES        | ON HOLD | Ground Waters Primary WATER | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|---------------------------|-------------|---------------------|--------|----------------------|---------|-----------------------------|----------------------|------------------------|
| 001    | 0960_MW145 5-5.5_211124   |             | 24/11/2021 10:24 AM | Water  | ALS: 4<br>Non ALS: 0 | No      | Partial 4/8                 |                      |                        |
| 002    | 0960_QC118_211124         |             | 24/11/2021 10:25 AM | Water  | ALS: 2<br>Non ALS: 0 | No      | Partial 1/8                 |                      |                        |
| 003    | 0960_MW138 3-3.5_211124   |             | 24/11/2021 10:55 AM | Water  | ALS: 4<br>Non ALS: 0 | No      | Partial 4/8                 |                      |                        |
| 004    | 0960_QC120_211124         |             | 24/11/2021 10:56 AM | Water  | ALS: 2<br>Non ALS: 0 | No      | Partial 1/8                 |                      |                        |
| 005    | 0960_MW137 2.5-3_211124   |             | 24/11/2021 12:14 PM | Water  | ALS: 6<br>Non ALS: 0 | No      | Partial 4/8                 | Extra lab QC PFAS    | Extra lab QC PFAS      |
| 006    | 0960_MW146 3-3.5_211124   |             | 24/11/2021 12:50 PM | Water  | ALS: 6<br>Non ALS: 0 | No      | Partial 4/8                 | Extra lab QC PFAS    | Extra lab QC PFAS      |
| 007    | 0960_MW180 3.5-4_211124   |             | 24/11/2021 01:21 PM | Water  | ALS: 4<br>Non ALS: 0 | No      | Partial 4/8                 |                      |                        |
| 008    | 0960_MW179 3.2-3.7_211124 |             | 24/11/2021 02:29 PM | Water  | ALS: 6<br>Non ALS: 0 | No      | Partial 4/8                 | Extra lab QC PFAS    | Extra lab QC PFAS      |



# CHAIN OF CUSTODY

COC#: 30620

ALS Laboratory: EP Perth

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: CG - DEF19009/Learmonth GW

ORDER NO: DEF19009/0960

PROJECT MANAGER

PRIMARY SAMPLER

EMAIL REPORTS TO

EMAIL INVOICES TO

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

SAMPLER MOBILE:

/ ES2019CARBSD0002

## LABORATORY USE ONLY (Circle)

Custody Seal intact?

Yes 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    | 0960_MW145_5-5.5_211124   | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 002    | 0960_QC118_211124         | Ground Waters Primary WATER | Water  | - EP231X PFAS - Full Suite (28 analytes)                                                                                                                                                                    |
| 003    | 0960_MW138_3-3.5_211124   | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 004    | 0960_QC120_211124         | Ground Waters Primary WATER | Water  | - EP231X PFAS - Full Suite (28 analytes)                                                                                                                                                                    |
| 005    | 0960_MW137_2.5-3_211124   | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 006    | 0960_MW146_3-3.5_211124   | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 007    | 0960_MW180_3.5-4_211124   | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 008    | 0960_MW179_3.2-3.7_211124 | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |



# CHAIN OF CUSTODY

ALS COC#: 30620

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: CG - DEF19009/Learmonth GW

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:

/ ES2019CARBSD0002

## LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes 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    | 0960_MW145_5-     | Clear Plastic Bottle - Natural | 250 mL | 00070220143168 | Green | No       |        |
| 001    | 0960_MW145_5-     | Clear Plastic Bottle - Natural | 250 mL | 00070220143129 | Green | No       |        |
| 001    | 0960_MW145_5-     | HDPE (no PTFE)                 | 20 mL  | 00352010040198 | Grey  | No       |        |
| 001    | 0960_MW145_5-     | HDPE (no PTFE)                 | 20 mL  | 00352010040249 | Grey  | No       |        |
| 002    | 0960_QC118_211124 | HDPE (no PTFE)                 | 20 mL  | 00350019177325 | Grey  | No       |        |
| 002    | 0960_QC118_211124 | HDPE (no PTFE)                 | 20 mL  | 00350019177448 | Grey  | No       |        |
| 003    | 0960_MW138_3-     | Clear Plastic Bottle - Natural | 250 mL | 00070220142825 | Green | No       |        |
| 003    | 0960_MW138_3-     | Clear Plastic Bottle - Natural | 250 mL | 00070220141388 | Green | No       |        |
| 003    | 0960_MW138_3-     | HDPE (no PTFE)                 | 20 mL  | 00352010040442 | Grey  | No       |        |
| 003    | 0960_MW138_3-     | HDPE (no PTFE)                 | 20 mL  | 00352010039984 | Grey  | No       |        |
| 004    | 0960_QC120_211124 | HDPE (no PTFE)                 | 20 mL  | 00350019035061 | Grey  | No       |        |
| 004    | 0960_QC120_211124 | HDPE (no PTFE)                 | 20 mL  | 00350019026886 | Grey  | No       |        |
| 005    | 0960_MW137_2.5-   | Clear Plastic Bottle - Natural | 250 mL | 00070220142459 | Green | No       |        |
| 005    | 0960_MW137_2.5-   | Clear Plastic Bottle - Natural | 250 mL | 00070220142276 | Green | No       |        |
| 005    | 0960_MW137_2.5-   | HDPE (no PTFE)                 | 20 mL  | 00352005019808 | Grey  | No       |        |
| 005    | 0960_MW137_2.5-   | HDPE (no PTFE)                 | 20 mL  | 00350019163918 | Grey  | No       |        |
| 005    | 0960_MW137_2.5-   | HDPE (no PTFE)                 | 20 mL  | 00350019164219 | Grey  | No       |        |
| 005    | 0960_MW137_2.5-   | HDPE (no PTFE)                 | 20 mL  | 00352010039944 | Grey  | No       |        |
| 006    | 0960_MW146_3-     | Clear Plastic Bottle - Natural | 250 mL | 00070220143139 | Green | No       |        |
| 006    | 0960_MW146_3-     | Clear Plastic Bottle - Natural | 250 mL | 00070220143156 | Green | No       |        |
| 006    | 0960_MW146_3-     | HDPE (no PTFE)                 | 20 mL  | 00352010040477 | Grey  | No       |        |
| 006    | 0960_MW146_3-     | HDPE (no PTFE)                 | 20 mL  | 00350019164228 | Grey  | No       |        |
| 006    | 0960_MW146_3-     | HDPE (no PTFE)                 | 20 mL  | 00350019164093 | Grey  | No       |        |
| 006    | 0960_MW146_3-     | HDPE (no PTFE)                 | 20 mL  | 00352010040401 | Grey  | No       |        |
| 007    | 0960_MW180_3.5-   | Clear Plastic Bottle - Natural | 250 mL | 00070220143096 | Green | No       |        |
| 007    | 0960_MW180_3.5-   | Clear Plastic Bottle - Natural | 250 mL | 00070220143135 | Green | No       |        |





# CHAIN OF CUSTODY

COC#: 30620

ALS Laboratory: EP Perth

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: CG - DEF19009/Learmonth GW

ORDER NO: DEF19009/0960

PROJECT MANAGER

PRIMARY SAMPLER

EMAIL REPORTS TO

EMAIL INVOICES TO

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

SAMPLER MOBILE:  
/ ES2019CARBSD0002**LABORATORY USE ONLY (Circle)**

Custody Seal intact?

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                                     | 0960_MW180_3.5- | HDPE (no PTFE)                 | 20 mL  | 00352010040125 | Grey  | No |  |
| 007                                     | 0960_MW180_3.5- | HDPE (no PTFE)                 | 20 mL  | 00352010040373 | Grey  | No |  |
| 008                                     | 0960_MW179_3.2- | Clear Plastic Bottle - Natural | 250 mL | 00070220143177 | Green | No |  |
| 008                                     | 0960_MW179_3.2- | Clear Plastic Bottle - Natural | 250 mL | 00070220143099 | Green | No |  |
| 008                                     | 0960_MW179_3.2- | HDPE (no PTFE)                 | 20 mL  | 00350019164328 | Grey  | No |  |
| 008                                     | 0960_MW179_3.2- | HDPE (no PTFE)                 | 20 mL  | 00352010039940 | Grey  | No |  |
| 008                                     | 0960_MW179_3.2- | HDPE (no PTFE)                 | 20 mL  | 00350019163954 | Grey  | No |  |
| 008                                     | 0960_MW179_3.2- | HDPE (no PTFE)                 | 20 mL  | 00352010040163 | Grey  | No |  |
| Total Bottle Count: ALS: 34, Non ALS: 0 |                 |                                |        |                |       |    |  |

**SAMPLE RECEIPT NOTIFICATION (SRN)****Work Order : EP2114394**

|              |                                                                  |              |                                              |
|--------------|------------------------------------------------------------------|--------------|----------------------------------------------|
| Client       | : CARDNO (WA) PTY LTD                                            | Laboratory   | : Environmental Division Perth               |
| Contact      | : [REDACTED]                                                     | Contact      | : [REDACTED]                                 |
| Address      | : 11 HARVEST TERRACE PO BOX 155<br>WEST PERTH WA, AUSTRALIA 6006 | Address      | : 26 Rigali Way Wangara WA Australia<br>6065 |
| E-mail       | : [REDACTED]@cardno.com.au                                       | E-mail       | : [REDACTED]@alsglobal.com                   |
| Telephone    | : ----                                                           | Telephone    | : +61-8-9406 1301                            |
| Facsimile    | : ----                                                           | Facsimile    | : +61-8-9406 1399                            |
| Project      | : WA_0960_PFASOMP                                                | Page         | : 1 of 2                                     |
| Order number | : DEF19009/0960                                                  | Quote number | : ES2019CARBSD0002 (SY/139/19)               |
| C-O-C number | : 30620                                                          | QC Level     | : NEPM 2013 B3 & ALS QC Standard             |
| Site         | : DEF19009/Learmonth                                             |              |                                              |
| Sampler      | : [REDACTED]                                                     |              |                                              |

**Dates**

|                           |                     |                          |                      |
|---------------------------|---------------------|--------------------------|----------------------|
| Date Samples Received     | : 26-Nov-2021 09:55 | Issue Date               | : 26-Nov-2021        |
| Client Requested Due Date | : 07-Dec-2021       | Scheduled Reporting Date | : <b>07-Dec-2021</b> |

**Delivery Details**

|                      |              |                                    |                      |
|----------------------|--------------|------------------------------------|----------------------|
| Mode of Delivery     | : Carrier    | Security Seal                      | : Not Available      |
| No. of coolers/boxes | : 3          | Temperature                        | : 24.8 - Ice present |
| Receipt Detail       | : Ice Metled | No. of samples received / analysed | : 8 / 8              |

**General Comments**

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



## Sample Container(s)/Preservation Non-Compliances

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

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

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

EP2114394-001 : 24-Nov-2021 10:24 : 0960\_MW145\_5-5.5\_211124  
EP2114394-003 : 24-Nov-2021 10:55 : 0960\_MW138\_3-3.5\_211124  
EP2114394-005 : 24-Nov-2021 12:14 : 0960\_MW137\_2.5-3\_211124  
EP2114394-006 : 24-Nov-2021 12:50 : 0960\_MW146\_3-3.5\_211124  
EP2114394-007 : 24-Nov-2021 13:21 : 0960\_MW180\_3.5-4\_211124  
EP2114394-008 : 24-Nov-2021 14:29 : 0960\_MW179\_3.2-3.7\_211124

## 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 - EN055 - PG<br>Ionic Balance by ED037P, ED041G, ED045G &<br>WATER - EP231X<br>PFAS - Full Suite (28 analytes) | WATER - NT-01<br>Major Cations (Ca, Mg, Na, K) | WATER - NT-02<br>Major Anions (Chloride, Sulphate, Alkalinity) |
|----------------------|----------------------|-------------------------|----------------------------------------------------------------------------------------------------------------------|------------------------------------------------|----------------------------------------------------------------|
| EP2114394-001        | 24-Nov-2021 10:24    | 0960_MW145_5-5.5_211... | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114394-002        | 24-Nov-2021 10:25    | 0960_QC118_211124       |                                                                                                                      | ✓                                              |                                                                |
| EP2114394-003        | 24-Nov-2021 10:55    | 0960_MW138_3-3.5_211... | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114394-004        | 24-Nov-2021 10:56    | 0960_QC120_211124       |                                                                                                                      | ✓                                              |                                                                |
| EP2114394-005        | 24-Nov-2021 12:14    | 0960_MW137_2.5-3_211... | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114394-006        | 24-Nov-2021 12:50    | 0960_MW146_3-3.5_211... | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114394-007        | 24-Nov-2021 13:21    | 0960_MW180_3.5-4_211... | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114394-008        | 24-Nov-2021 14:29    | 0960_MW179_3.2-3.7_2... | ✓                                                                                                                    | ✓                                              | ✓                                                              |

## Proactive Holding Time Report

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

## Requested Deliverables

|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------------------------------|
| <div> <div></div> <div></div> </div> <ul style="list-style-type: none"> <li>- A4 - AU Tax Invoice (INV)</li> </ul>                                                                                                                                                                                                                                                                                                                                            | Email | <div>cardno.com.au</div>     |
| <b>DERP LAB REPORTS</b>                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |                              |
| <div> <div></div> <div></div> </div> <ul style="list-style-type: none"> <li>- EDI Format - ESDAT (ESDAT)</li> </ul>                                                                                                                                                                                                                                                                                                                                           | Email | derp.labreports@esdat.com.au |
| <div> <div></div> <div></div> </div> <ul style="list-style-type: none"> <li>- *AU Certificate of Analysis - NATA (COA)</li> <li>- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)</li> <li>- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)</li> <li>- A4 - AU Sample Receipt Notification - Environmental HT (SRN)</li> <li>- Chain of Custody (CoC) (COC)</li> <li>- EDI Format - ESDAT (ESDAT)</li> <li>- EDI Format - XTab (XTAB)</li> </ul> | Email | <div>cardno.com.au</div>     |
| <b>Perth</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |                              |
| <ul style="list-style-type: none"> <li>- A4 - AU Tax Invoice (INV)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                 | Email | perth@cardno.com.au          |

## CERTIFICATE OF ANALYSIS

**Work Order** : **EP2114394**  
**Client** : **CARDNO (WA) PTY LTD**  
**Contact** : [REDACTED]  
**Address** : 11 HARVEST TERRACE PO BOX 155  
 WEST PERTH WA, AUSTRALIA 6006  
**Telephone** : ----  
**Project** : WA\_0960\_PFASOMP  
**Order number** : DEF19009/0960  
**C-O-C number** : 30620  
**Sampler** : [REDACTED]  
**Site** : DEF19009/Learmonth  
**Quote number** : SY/139/19  
**No. of samples received** : 8  
**No. of samples analysed** : 8

**Page** : 1 of 9  
**Laboratory** : Environmental Division Perth  
**Contact** : [REDACTED]  
**Address** : 26 Rigali Way Wangara WA Australia 6065  
**Telephone** : +61-8-9406 1301  
**Date Samples Received** : 26-Nov-2021 09:55  
**Date Analysis Commenced** : 01-Dec-2021  
**Issue Date** : 07-Dec-2021 12:07



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>    |
|------------------------------------------------------------------------|----------------------------|----------------------------------|
| <span style="background-color: black; color: black;">[REDACTED]</span> | Laboratory Manager (Perth) | Perth Inorganics, Wangara, WA    |
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator           | Sydney Organics, Smithfield, NSW |





## 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.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- 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.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, 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: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                                   |             |      |       | 0960_MW145_5-5.5_2<br>11124 | 0960_QC118_211124 | 0960_MW138_3-3.5_2<br>11124 | 0960_QC120_211124 | 0960_MW137_2.5-3_2<br>11124 |
|-------------------------------------------------------------------|-------------|------|-------|-----------------------------|-------------------|-----------------------------|-------------------|-----------------------------|
| Sampling date / time                                              |             |      |       | 24-Nov-2021 10:24           | 24-Nov-2021 10:25 | 24-Nov-2021 10:55           | 24-Nov-2021 10:56 | 24-Nov-2021 12:14           |
| Compound                                                          | CAS Number  | LOR  | Unit  | EP2114394-001               | EP2114394-002     | EP2114394-003               | EP2114394-004     | EP2114394-005               |
|                                                                   |             |      |       | Result                      | Result            | Result                      | Result            | Result                      |
| <b>ED037P: Alkalinity by PC Titrator</b>                          |             |      |       |                             |                   |                             |                   |                             |
| Hydroxide Alkalinity as CaCO <sub>3</sub>                         | DMO-210-001 | 1    | mg/L  | <1                          | ----              | <1                          | ----              | <1                          |
| Carbonate Alkalinity as CaCO <sub>3</sub>                         | 3812-32-6   | 1    | mg/L  | <1                          | ----              | <1                          | ----              | <1                          |
| Bicarbonate Alkalinity as CaCO <sub>3</sub>                       | 71-52-3     | 1    | mg/L  | 123                         | ----              | 165                         | ----              | 200                         |
| Total Alkalinity as CaCO <sub>3</sub>                             | ----        | 1    | mg/L  | 123                         | ----              | 165                         | ----              | 200                         |
| <b>ED041G: Sulfate (Turbidimetric) as SO<sub>4</sub> 2- by DA</b> |             |      |       |                             |                   |                             |                   |                             |
| Sulfate as SO <sub>4</sub> - Turbidimetric                        | 14808-79-8  | 1    | mg/L  | 5390                        | ----              | 4510                        | ----              | 4090                        |
| <b>ED045G: Chloride by Discrete Analyser</b>                      |             |      |       |                             |                   |                             |                   |                             |
| Chloride                                                          | 16887-00-6  | 1    | mg/L  | 36400                       | ----              | 29400                       | ----              | 27500                       |
| <b>ED093F: Dissolved Major Cations</b>                            |             |      |       |                             |                   |                             |                   |                             |
| Calcium                                                           | 7440-70-2   | 1    | mg/L  | 1080                        | ----              | 974                         | ----              | 666                         |
| Magnesium                                                         | 7439-95-4   | 1    | mg/L  | 2780                        | ----              | 2270                        | ----              | 2150                        |
| Sodium                                                            | 7440-23-5   | 1    | mg/L  | 23000                       | ----              | 20000                       | ----              | 17300                       |
| Potassium                                                         | 7440-09-7   | 1    | mg/L  | 1180                        | ----              | 890                         | ----              | 908                         |
| <b>EN055: Ionic Balance</b>                                       |             |      |       |                             |                   |                             |                   |                             |
| ∅ Total Anions                                                    | ----        | 0.01 | meq/L | 1140                        | ----              | 926                         | ----              | 865                         |
| ∅ Total Cations                                                   | ----        | 0.01 | meq/L | 1310                        | ----              | 1130                        | ----              | 986                         |
| ∅ Ionic Balance                                                   | ----        | 0.01 | %     | 7.00                        | ----              | 9.81                        | ----              | 6.54                        |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>                      |             |      |       |                             |                   |                             |                   |                             |
| Perfluorobutane sulfonic acid (PFBS)                              | 375-73-5    | 0.02 | µg/L  | <0.02                       | <0.02             | <0.02                       | <0.02             | <0.02                       |
| Perfluoropentane sulfonic acid (PFPeS)                            | 2706-91-4   | 0.02 | µg/L  | <0.02                       | <0.02             | <0.02                       | <0.02             | <0.02                       |
| Perfluorohexane sulfonic acid (PFHxS)                             | 355-46-4    | 0.01 | µg/L  | <0.01                       | <0.01             | <0.01                       | <0.01             | <0.01                       |
| Perfluoroheptane sulfonic acid (PFHpS)                            | 375-92-8    | 0.02 | µg/L  | <0.02                       | <0.02             | <0.02                       | <0.02             | <0.02                       |
| Perfluorooctane sulfonic acid (PFOS)                              | 1763-23-1   | 0.01 | µg/L  | <0.01                       | <0.01             | 0.03                        | <0.01             | <0.01                       |
| Perfluorodecane sulfonic acid (PFDS)                              | 335-77-3    | 0.02 | µg/L  | <0.02                       | <0.02             | <0.02                       | <0.02             | <0.02                       |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>                    |             |      |       |                             |                   |                             |                   |                             |
| 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                       |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_MW145_5-5.5_2<br>11124 | 0960_QC118_211124 | 0960_MW138_3-3.5_2<br>11124 | 0960_QC120_211124 | 0960_MW137_2.5-3_2<br>11124 |
|------------------------------------------------------------|-------------|------|------|-----------------------------|-------------------|-----------------------------|-------------------|-----------------------------|
| Sampling date / time                                       |             |      |      | 24-Nov-2021 10:24           | 24-Nov-2021 10:25 | 24-Nov-2021 10:55           | 24-Nov-2021 10:56 | 24-Nov-2021 12:14           |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2114394-001               | EP2114394-002     | EP2114394-003               | EP2114394-004     | EP2114394-005               |
|                                                            |             |      |      | Result                      | Result            | Result                      | Result            | Result                      |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                             |                   |                             |                   |                             |
| 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                       |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                             |                   |                             |                   |                             |
| Perfluorooctane sulfonamide (FOSA)                         | 754-91-6    | 0.02 | µg/L | <0.02                       | <0.02             | <0.02                       | <0.02             | <0.02                       |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)              | 31506-32-8  | 0.05 | µg/L | <0.05                       | <0.05             | <0.05                       | <0.05             | <0.05                       |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)               | 4151-50-2   | 0.05 | µg/L | <0.05                       | <0.05             | <0.05                       | <0.05             | <0.05                       |
| N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)       | 24448-09-7  | 0.05 | µg/L | <0.05                       | <0.05             | <0.05                       | <0.05             | <0.05                       |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)        | 1691-99-2   | 0.05 | µg/L | <0.05                       | <0.05             | <0.05                       | <0.05             | <0.05                       |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)  | 2355-31-9   | 0.02 | µg/L | <0.02                       | <0.02             | <0.02                       | <0.02             | <0.02                       |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)   | 2991-50-6   | 0.02 | µg/L | <0.02                       | <0.02             | <0.02                       | <0.02             | <0.02                       |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                             |                   |                             |                   |                             |
| 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                       |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_MW145_5-5.5_2<br>11124 | 0960_QC118_211124 | 0960_MW138_3-3.5_2<br>11124 | 0960_QC120_211124 | 0960_MW137_2.5-3_2<br>11124 |
|---------------------------------------------------------------|--------------------|------|------|-----------------------------|-------------------|-----------------------------|-------------------|-----------------------------|
| Sampling date / time                                          |                    |      |      | 24-Nov-2021 10:24           | 24-Nov-2021 10:25 | 24-Nov-2021 10:55           | 24-Nov-2021 10:56 | 24-Nov-2021 12:14           |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2114394-001               | EP2114394-002     | EP2114394-003               | EP2114394-004     | EP2114394-005               |
|                                                               |                    |      |      | Result                      | Result            | Result                      | Result            | Result                      |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                             |                   |                             |                   |                             |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05                       | <0.05             | <0.05                       | <0.05             | <0.05                       |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                             |                   |                             |                   |                             |
| Sum of PFAS                                                   | ----               | 0.01 | µg/L | <0.01                       | <0.01             | 0.03                        | <0.01             | <0.01                       |
| Sum of PFHxS and PFOS                                         | 355-46-4/1763-23-1 | 0.01 | µg/L | <0.01                       | <0.01             | 0.03                        | <0.01             | <0.01                       |
| Sum of PFAS (WA DER List)                                     | ----               | 0.01 | µg/L | <0.01                       | <0.01             | 0.03                        | <0.01             | <0.01                       |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                             |                   |                             |                   |                             |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 115                         | 109               | 113                         | 117               | 113                         |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 109                         | 107               | 108                         | 105               | 108                         |





## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                        |             |      |       | 0960_MW146_3-3.5_2<br>11124 | 0960_MW180_3.5-4_2<br>11124 | 0960_MW179_3.2-3.7<br>_211124 | ----  | ----  |
|--------------------------------------------------------|-------------|------|-------|-----------------------------|-----------------------------|-------------------------------|-------|-------|
| Sampling date / time                                   |             |      |       | 24-Nov-2021 12:50           | 24-Nov-2021 13:21           | 24-Nov-2021 14:29             | ----  | ----  |
| Compound                                               | CAS Number  | LOR  | Unit  | EP2114394-006               | EP2114394-007               | EP2114394-008                 | ----- | ----- |
| Result                                                 |             |      |       | Result                      | Result                      | Result                        | ----  | ----  |
| <b>ED037P: Alkalinity by PC Titrator</b>               |             |      |       |                             |                             |                               |       |       |
| Hydroxide Alkalinity as CaCO3                          | DMO-210-001 | 1    | mg/L  | <1                          | <1                          | <1                            | ----  | ----  |
| Carbonate Alkalinity as CaCO3                          | 3812-32-6   | 1    | mg/L  | <1                          | <1                          | <1                            | ----  | ----  |
| Bicarbonate Alkalinity as CaCO3                        | 71-52-3     | 1    | mg/L  | 128                         | 219                         | 176                           | ----  | ----  |
| Total Alkalinity as CaCO3                              | ----        | 1    | mg/L  | 128                         | 219                         | 176                           | ----  | ----  |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b> |             |      |       |                             |                             |                               |       |       |
| Sulfate as SO4 - Turbidimetric                         | 14808-79-8  | 1    | mg/L  | 5800                        | 4730                        | 4000                          | ----  | ----  |
| <b>ED045G: Chloride by Discrete Analyser</b>           |             |      |       |                             |                             |                               |       |       |
| Chloride                                               | 16887-00-6  | 1    | mg/L  | 35100                       | 31600                       | 28000                         | ----  | ----  |
| <b>ED093F: Dissolved Major Cations</b>                 |             |      |       |                             |                             |                               |       |       |
| Calcium                                                | 7440-70-2   | 1    | mg/L  | 1060                        | 784                         | 662                           | ----  | ----  |
| Magnesium                                              | 7439-95-4   | 1    | mg/L  | 2810                        | 2560                        | 2240                          | ----  | ----  |
| Sodium                                                 | 7440-23-5   | 1    | mg/L  | 23400                       | 21100                       | 18000                         | ----  | ----  |
| Potassium                                              | 7440-09-7   | 1    | mg/L  | 1060                        | 967                         | 922                           | ----  | ----  |
| <b>EN055: Ionic Balance</b>                            |             |      |       |                             |                             |                               |       |       |
| ∅ Total Anions                                         | ----        | 0.01 | meq/L | 1110                        | 994                         | 877                           | ----  | ----  |
| ∅ Total Cations                                        | ----        | 0.01 | meq/L | 1330                        | 1190                        | 1020                          | ----  | ----  |
| ∅ Ionic Balance                                        | ----        | 0.01 | %     | 8.83                        | 9.06                        | 7.75                          | ----  | ----  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>           |             |      |       |                             |                             |                               |       |       |
| Perfluorobutane sulfonic acid (PFBS)                   | 375-73-5    | 0.02 | µg/L  | <0.02                       | <0.02                       | <0.02                         | ----  | ----  |
| Perfluoropentane sulfonic acid (PFPeS)                 | 2706-91-4   | 0.02 | µg/L  | <0.02                       | <0.02                       | <0.02                         | ----  | ----  |
| Perfluorohexane sulfonic acid (PFHxS)                  | 355-46-4    | 0.01 | µg/L  | <0.01                       | <0.01                       | <0.01                         | ----  | ----  |
| Perfluoroheptane sulfonic acid (PFHpS)                 | 375-92-8    | 0.02 | µg/L  | <0.02                       | <0.02                       | <0.02                         | ----  | ----  |
| Perfluorooctane sulfonic acid (PFOS)                   | 1763-23-1   | 0.01 | µg/L  | <0.01                       | <0.01                       | <0.01                         | ----  | ----  |
| Perfluorodecane sulfonic acid (PFDS)                   | 335-77-3    | 0.02 | µg/L  | <0.02                       | <0.02                       | <0.02                         | ----  | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>         |             |      |       |                             |                             |                               |       |       |
| 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                         | ----  | ----  |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_MW146_3-3.5_2<br>11124 | 0960_MW180_3.5-4_2<br>11124 | 0960_MW179_3.2-3.7<br>_211124 | ----  | ----  |
|------------------------------------------------------------|-------------|------|------|-----------------------------|-----------------------------|-------------------------------|-------|-------|
| Sampling date / time                                       |             |      |      | 24-Nov-2021 12:50           | 24-Nov-2021 13:21           | 24-Nov-2021 14:29             | ----  | ----  |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2114394-006               | EP2114394-007               | EP2114394-008                 | ----- | ----- |
|                                                            |             |      |      | Result                      | Result                      | Result                        | ----  | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                             |                             |                               |       |       |
| 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                         | ----  | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                             |                             |                               |       |       |
| 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                         | ----  | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                             |                             |                               |       |       |
| 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                         | ----  | ----  |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_MW146_3-3.5_2<br>11124 | 0960_MW180_3.5-4_2<br>11124 | 0960_MW179_3.2-3.7<br>_211124 | ----  | ----  |
|---------------------------------------------------------------|--------------------|------|------|-----------------------------|-----------------------------|-------------------------------|-------|-------|
| Sampling date / time                                          |                    |      |      | 24-Nov-2021 12:50           | 24-Nov-2021 13:21           | 24-Nov-2021 14:29             | ----  | ----  |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2114394-006               | EP2114394-007               | EP2114394-008                 | ----- | ----- |
|                                                               |                    |      |      | Result                      | Result                      | Result                        | ----  | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                             |                             |                               |       |       |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05                       | <0.05                       | <0.05                         | ----  | ----  |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                             |                             |                               |       |       |
| 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                         | ----  | ----  |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                             |                             |                               |       |       |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 109                         | 108                         | 120                           | ----  | ----  |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 106                         | 103                         | 108                           | ----  | ----  |

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Work Order : EP2114394  
Client : CARDNO (WA) PTY LTD  
Project : WA\_0960\_PFASOMP



## Surrogate Control Limits

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

## Inter-Laboratory Testing

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



## QUALITY CONTROL REPORT

|                         |                                                                  |                         |                                           |
|-------------------------|------------------------------------------------------------------|-------------------------|-------------------------------------------|
| Work Order              | : EP2114394                                                      | Page                    | : 1 of 8                                  |
| Client                  | : CARDNO (WA) PTY LTD                                            | Laboratory              | : Environmental Division Perth            |
| Contact                 | : [REDACTED]                                                     | Contact                 | : [REDACTED]                              |
| Address                 | : 11 HARVEST TERRACE PO BOX 155<br>WEST PERTH WA, AUSTRALIA 6006 | Address                 | : 26 Rigali Way Wangara WA Australia 6065 |
| Telephone               | : ----                                                           | Telephone               | : +61-8-9406 1301                         |
| Project                 | : WA_0960_PFASOMP                                                | Date Samples Received   | : 26-Nov-2021                             |
| Order number            | : DEF19009/0960                                                  | Date Analysis Commenced | : 01-Dec-2021                             |
| C-O-C number            | : 30620                                                          | Issue Date              | : 07-Dec-2021                             |
| Sampler                 | : [REDACTED]                                                     |                         |                                           |
| Site                    | : DEF19009/Learmonth                                             |                         |                                           |
| Quote number            | : SY/139/19                                                      |                         |                                           |
| No. of samples received | : 8                                                              |                         |                                           |
| No. of samples analysed | : 8                                                              |                         |                                           |



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

This Quality Control Report contains the following information:

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

### Signatories

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

| Signatories | Position                   | Accreditation Category           |
|-------------|----------------------------|----------------------------------|
| [REDACTED]  | Laboratory Manager (Perth) | Perth Inorganics, Wangara, WA    |
| [REDACTED]  | LCMS Coordinator           | Sydney Organics, Smithfield, NSW |



## 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**

| Sub-Matrix: <b>WATER</b>                                          |                          |                                          |             | Laboratory Duplicate (DUP) Report |      |                 |                  |         |                    |
|-------------------------------------------------------------------|--------------------------|------------------------------------------|-------------|-----------------------------------|------|-----------------|------------------|---------|--------------------|
| Laboratory sample ID                                              | Sample ID                | Method: Compound                         | CAS Number  | LOR                               | Unit | Original Result | Duplicate Result | RPD (%) | Acceptable RPD (%) |
| ED037P: Alkalinity by PC Titrator (QC Lot: 4053979)               |                          |                                          |             |                                   |      |                 |                  |         |                    |
| EP2114074-003                                                     | Anonymous                | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                          | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                          | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 30              | 31               | 3.7     | 0% - 20%           |
|                                                                   |                          | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 30              | 31               | 3.7     | 0% - 20%           |
| EP2114263-002                                                     | Anonymous                | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                          | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | 3               | 3                | 0.0     | No Limit           |
|                                                                   |                          | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 74              | 73               | 2.0     | 0% - 20%           |
|                                                                   |                          | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 77              | 76               | 1.8     | 0% - 20%           |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4040540) |                          |                                          |             |                                   |      |                 |                  |         |                    |
| EP2114394-001                                                     | 0960_MW145_5-5.5_21112 4 | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 5390            | 5290             | 1.9     | 0% - 20%           |
| EP2114395-006                                                     | Anonymous                | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 272             | 273              | 0.0     | 0% - 20%           |
| ED045G: Chloride by Discrete Analyser (QC Lot: 4040539)           |                          |                                          |             |                                   |      |                 |                  |         |                    |
| EP2114394-001                                                     | 0960_MW145_5-5.5_21112 4 | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 36400           | 35700            | 1.8     | 0% - 20%           |
| EP2114395-006                                                     | Anonymous                | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 3070            | 3150             | 2.4     | 0% - 20%           |
| ED093F: Dissolved Major Cations (QC Lot: 4042970)                 |                          |                                          |             |                                   |      |                 |                  |         |                    |
| EP2114394-001                                                     | 0960_MW145_5-5.5_21112 4 | ED093F: Calcium                          | 7440-70-2   | 1                                 | mg/L | 1080            | 1090             | 0.6     | 0% - 20%           |
|                                                                   |                          | ED093F: Magnesium                        | 7439-95-4   | 1                                 | mg/L | 2780            | 2810             | 1.2     | 0% - 20%           |
|                                                                   |                          | ED093F: Sodium                           | 7440-23-5   | 1                                 | mg/L | 23000           | 23300            | 1.7     | 0% - 20%           |
|                                                                   |                          | ED093F: Potassium                        | 7440-09-7   | 1                                 | mg/L | 1180            | 1200             | 1.4     | 0% - 20%           |
| EP2114395-006                                                     | Anonymous                | ED093F: Calcium                          | 7440-70-2   | 1                                 | mg/L | 210             | 209              | 0.0     | 0% - 20%           |
|                                                                   |                          | ED093F: Magnesium                        | 7439-95-4   | 1                                 | mg/L | 178             | 177              | 0.0     | 0% - 20%           |



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 (%) |
| ED093F: Dissolved Major Cations (QC Lot: 4042970) - continued |                           |                                                |            |                                   |       |                 |                  |         |                    |
| EP2114395-006                                                 | Anonymous                 | ED093F: Sodium                                 | 7440-23-5  | 1                                 | mg/L  | 1710            | 1700             | 0.4     | 0% - 20%           |
|                                                               |                           | ED093F: Potassium                              | 7440-09-7  | 1                                 | mg/L  | 66              | 65               | 0.0     | 0% - 20%           |
| EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4051169)       |                           |                                                |            |                                   |       |                 |                  |         |                    |
| EP2114394-005                                                 | 0960_MW137_2.5-3_211124   | 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           |
| EP2114394-008                                                 | 0960_MW179_3.2-3.7_211124 | 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: 4051169)     |                           |                                                |            |                                   |       |                 |                  |         |                    |
| EP2114394-005                                                 | 0960_MW137_2.5-3_211124   | 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           |
| EP2114394-008                                                 | 0960_MW179_3.2-3.7_211124 | EP231X: Perfluorooctanoic acid (PFOA)          | 335-67-1   | 0.01                              | µg/L  | <0.01           | <0.01            | 0.0     | No Limit           |
|                                                               |                           | EP231X: Perfluoropentanoic acid (PFPeA)        | 2706-90-3  | 0.02                              | µg/L  | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                               |                           | EP231X: Perfluorohexanoic acid (PFHxA)         | 307-24-4   | 0.02                              | µg/L  | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                               |                           | EP231X: Perfluoroheptanoic acid (PFHpA)        | 375-85-9   | 0.02                              | µg/L  | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                               |                           | EP231X: Perfluorononanoic acid (PFNA)          | 375-95-1   | 0.02                              | µg/L  | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                               |                           | EP231X: Perfluorodecanoic acid (PFDA)          | 335-76-2   | 0.02                              | µg/L  | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                               |                           | EP231X: Perfluoroundecanoic acid (PFUnDA)      | 2058-94-8  | 0.02                              | µg/L  | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                               |                           | EP231X: Perfluorododecanoic acid (PFDoDA)      | 307-55-1   | 0.02                              | µg/L  | <0.02           | <0.02            | 0.0     | No Limit           |
| EP231X: Perfluorotridecanoic acid (PFTrDA)                    | 72629-94-8                | 0.02                                           | µg/L       | <0.02                             | <0.02 | 0.0             | No Limit         |         |                    |



Sub-Matrix: **WATER**

| Sub-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: 4051169) - continued |                           |                                                                   |             |                                   |      |                 |                  |         |                    |
| EP2114394-008                                                         | 0960_MW179_3.2-3.7_211124 | 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: 4051169)                 |                           |                                                                   |             |                                   |      |                 |                  |         |                    |
| EP2114394-005                                                         | 0960_MW137_2.5-3_211124   | 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           |
| EP2114394-008                                                         | 0960_MW179_3.2-3.7_211124 | 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: 4051169)          |                           |                                                                   |             |                                   |      |                 |                  |         |                    |
| EP2114394-005                                                         | 0960_MW137_2.5-3_211124   | 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           |



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 Work Order : EP2114394  
 Client : CARDNO (WA) PTY LTD  
 Project : WA\_0960\_PFASOMP



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 (%) |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4051169) - continued |                               |                                                     |             |                                   |      |                 |                  |         |                    |
| EP2114394-008                                                            | 0960_MW179_3.2-3.7_211<br>124 | 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: 4051169)                                      |                               |                                                     |             |                                   |      |                 |                  |         |                    |
| EP2114394-005                                                            | 0960_MW137_2.5-3_21112<br>4   | EP231X: Sum of PFAS                                 | ----        | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
| EP2114394-008                                                            | 0960_MW179_3.2-3.7_211<br>124 | EP231X: Sum of PFAS                                 | ----        | 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**

| Sub-Matrix: WATER                                                |                 |      |      | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                    |                       |      |
|------------------------------------------------------------------|-----------------|------|------|-----------------------------|---------------------------------------|--------------------|-----------------------|------|
|                                                                  |                 |      |      |                             | Spike<br>Concentration                | Spike Recovery (%) | Acceptable Limits (%) |      |
| Method: Compound                                                 | CAS Number      | LOR  | Unit | Result                      |                                       | LCS                | Low                   | High |
| ED037P: Alkalinity by PC Titrator (QCLot: 4053979)               |                 |      |      |                             |                                       |                    |                       |      |
| ED037-P: Hydroxide Alkalinity as CaCO3                           | DMO-210-00<br>1 | 1    | mg/L | <1                          | ----                                  | ----               | ----                  | ---- |
| ED037-P: Carbonate Alkalinity as CaCO3                           | 3812-32-6       | 1    | mg/L | <1                          | ----                                  | ----               | ----                  | ---- |
| ED037-P: Bicarbonate Alkalinity as CaCO3                         | 71-52-3         | 1    | mg/L | <1                          | ----                                  | ----               | ----                  | ---- |
| ED037-P: Total Alkalinity as CaCO3                               | ----            | 1    | mg/L | <1                          | 20 mg/L                               | 109                | 81.2                  | 126  |
|                                                                  |                 |      |      | <1                          | 200 mg/L                              | 102                | 90.0                  | 110  |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4040540) |                 |      |      |                             |                                       |                    |                       |      |
| ED041G: Sulfate as SO4 - Turbidimetric                           | 14808-79-8      | 1    | mg/L | <1                          | 25 mg/L                               | 102                | 87.7                  | 113  |
|                                                                  |                 |      |      | <1                          | 500 mg/L                              | 104                | 87.7                  | 113  |
| ED045G: Chloride by Discrete Analyser (QCLot: 4040539)           |                 |      |      |                             |                                       |                    |                       |      |
| ED045G: Chloride                                                 | 16887-00-6      | 1    | mg/L | <1                          | 10 mg/L                               | 98.7               | 87.9                  | 114  |
|                                                                  |                 |      |      | <1                          | 1000 mg/L                             | 102                | 87.9                  | 114  |
| ED093F: Dissolved Major Cations (QCLot: 4042970)                 |                 |      |      |                             |                                       |                    |                       |      |
| ED093F: Calcium                                                  | 7440-70-2       | 1    | mg/L | <1                          | 50 mg/L                               | 98.3               | 85.9                  | 113  |
| ED093F: Magnesium                                                | 7439-95-4       | 1    | mg/L | <1                          | 50 mg/L                               | 97.8               | 88.0                  | 110  |
| ED093F: Sodium                                                   | 7440-23-5       | 1    | mg/L | <1                          | 50 mg/L                               | 104                | 87.3                  | 118  |
| ED093F: Potassium                                                | 7440-09-7       | 1    | mg/L | <1                          | 50 mg/L                               | 91.9               | 89.7                  | 108  |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4051169)           |                 |      |      |                             |                                       |                    |                       |      |
| EP231X: Perfluorobutane sulfonic acid (PFBS)                     | 375-73-5        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 112                | 72.0                  | 130  |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)                   | 2706-91-4       | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 99.8               | 71.0                  | 127  |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)                    | 355-46-4        | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 99.4               | 68.0                  | 131  |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)                   | 375-92-8        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 103                | 69.0                  | 134  |
| EP231X: Perfluorooctane sulfonic acid (PFOS)                     | 1763-23-1       | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 105                | 65.0                  | 140  |
| EP231X: Perfluorodecane sulfonic acid (PFDS)                     | 335-77-3        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 91.4               | 53.0                  | 142  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4051169)         |                 |      |      |                             |                                       |                    |                       |      |
| EP231X: Perfluorobutanoic acid (PFBA)                            | 375-22-4        | 0.1  | µg/L | <0.1                        | 1.25 µg/L                             | 91.4               | 73.0                  | 129  |
| EP231X: Perfluoropentanoic acid (PFPeA)                          | 2706-90-3       | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 105                | 72.0                  | 129  |
| EP231X: Perfluorohexanoic acid (PFHxA)                           | 307-24-4        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 120                | 72.0                  | 129  |
| EP231X: Perfluoroheptanoic acid (PFHpA)                          | 375-85-9        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 116                | 72.0                  | 130  |
| EP231X: Perfluorooctanoic acid (PFOA)                            | 335-67-1        | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 118                | 71.0                  | 133  |
| EP231X: Perfluorononanoic acid (PFNA)                            | 375-95-1        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 103                | 69.0                  | 130  |
| EP231X: Perfluorodecanoic acid (PFDA)                            | 335-76-2        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 116                | 71.0                  | 129  |
| EP231X: Perfluoroundecanoic acid (PFUnDA)                        | 2058-94-8       | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 112                | 69.0                  | 133  |
| EP231X: Perfluorododecanoic acid (PFDoDA)                        | 307-55-1        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 107                | 72.0                  | 134  |



Sub-Matrix: **WATER**

| Sub-Matrix: WATER                                                    |             |      |      | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |     |
|----------------------------------------------------------------------|-------------|------|------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|-----|
|                                                                      |             |      |      |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |     |
| Method: Compound                                                     | CAS Number  | LOR  | Unit | Result                      |                                       |                           |                                   |     |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4051169) - continued |             |      |      |                             |                                       |                           |                                   |     |
| 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                            | 104                       | 71.0                              | 132 |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4051169)                 |             |      |      |                             |                                       |                           |                                   |     |
| EP231X: Perfluorooctane sulfonamide (FOSA)                           | 754-91-6    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 105                       | 67.0                              | 137 |
| EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)                | 31506-32-8  | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 79.1                      | 68.0                              | 141 |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)                 | 4151-50-2   | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 86.4                      | 62.6                              | 147 |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)         | 24448-09-7  | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 99.7                      | 66.0                              | 145 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)          | 1691-99-2   | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 95.5                      | 57.6                              | 145 |
| EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)    | 2355-31-9   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 103                       | 65.0                              | 136 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)     | 2991-50-6   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 123                       | 61.0                              | 135 |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4051169)          |             |      |      |                             |                                       |                           |                                   |     |
| EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                    | 757124-72-4 | 0.05 | µg/L | <0.05                       | 0.25 µg/L                             | 106                       | 63.0                              | 143 |
| EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                    | 27619-97-2  | 0.05 | µg/L | <0.05                       | 0.25 µg/L                             | 114                       | 64.0                              | 140 |
| EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                    | 39108-34-4  | 0.05 | µg/L | <0.05                       | 0.25 µg/L                             | 100                       | 67.0                              | 138 |
| EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)                  | 120226-60-0 | 0.05 | µg/L | <0.05                       | 0.25 µg/L                             | 81.6                      | 71.4                              | 144 |

## Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

|                                                                         |                         |                                                |            | Matrix Spike (MS) Report |                        |                       |      |
|-------------------------------------------------------------------------|-------------------------|------------------------------------------------|------------|--------------------------|------------------------|-----------------------|------|
|                                                                         |                         |                                                |            | Spike<br>Concentration   | SpikeRecovery(%)<br>MS | Acceptable Limits (%) |      |
| Laboratory sample ID                                                    | Sample ID               | Method: Compound                               | CAS Number |                          |                        | Low                   | High |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4040540)</b> |                         |                                                |            |                          |                        |                       |      |
| EP2114394-001                                                           | 0960_MW145_5-5.5_211124 | ED041G: Sulfate as SO4 - Turbidimetric         | 14808-79-8 | 100 mg/L                 | # Not Determined       | 70.0                  | 130  |
| <b>ED045G: Chloride by Discrete Analyser (QCLot: 4040539)</b>           |                         |                                                |            |                          |                        |                       |      |
| EP2114394-001                                                           | 0960_MW145_5-5.5_211124 | ED045G: Chloride                               | 16887-00-6 | 1000 mg/L                | # Not Determined       | 70.0                  | 130  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4051169)</b>           |                         |                                                |            |                          |                        |                       |      |
| EP2114394-006                                                           | 0960_MW146_3-3.5_211124 | EP231X: Perfluorobutane sulfonic acid (PFBS)   | 375-73-5   | 0.25 µg/L                | 120                    | 72.0                  | 130  |
|                                                                         |                         | EP231X: Perfluoropentane sulfonic acid (PFPeS) | 2706-91-4  | 0.25 µg/L                | 102                    | 71.0                  | 127  |
|                                                                         |                         | EP231X: Perfluorohexane sulfonic acid (PFHxS)  | 355-46-4   | 0.25 µg/L                | 106                    | 68.0                  | 131  |
|                                                                         |                         | EP231X: Perfluoroheptane sulfonic acid (PFHpS) | 375-92-8   | 0.25 µg/L                | 106                    | 69.0                  | 134  |



Sub-Matrix: **WATER**

| 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: 4051169) - continued |                         |                                                                   |             |                          |                  |                       |      |
| EP2114394-006                                                      | 0960_MW146_3-3.5_211124 | EP231X: Perfluorooctane sulfonic acid (PFOS)                      | 1763-23-1   | 0.25 µg/L                | 111              | 65.0                  | 140  |
|                                                                    |                         | EP231X: Perfluorodecane sulfonic acid (PFDS)                      | 335-77-3    | 0.25 µg/L                | 100              | 53.0                  | 142  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4051169)           |                         |                                                                   |             |                          |                  |                       |      |
| EP2114394-006                                                      | 0960_MW146_3-3.5_211124 | EP231X: Perfluorobutanoic acid (PFBA)                             | 375-22-4    | 1.25 µg/L                | 101              | 73.0                  | 129  |
|                                                                    |                         | EP231X: Perfluoropentanoic acid (PFPeA)                           | 2706-90-3   | 0.25 µg/L                | 113              | 72.0                  | 129  |
|                                                                    |                         | EP231X: Perfluorohexanoic acid (PFHxA)                            | 307-24-4    | 0.25 µg/L                | 119              | 72.0                  | 129  |
|                                                                    |                         | EP231X: Perfluoroheptanoic acid (PFHpA)                           | 375-85-9    | 0.25 µg/L                | 124              | 72.0                  | 130  |
|                                                                    |                         | EP231X: Perfluorooctanoic acid (PFOA)                             | 335-67-1    | 0.25 µg/L                | 126              | 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                | 123              | 71.0                  | 129  |
|                                                                    |                         | EP231X: Perfluoroundecanoic acid (PFUnDA)                         | 2058-94-8   | 0.25 µg/L                | 122              | 69.0                  | 133  |
|                                                                    |                         | EP231X: Perfluorododecanoic acid (PFDoDA)                         | 307-55-1    | 0.25 µg/L                | 115              | 72.0                  | 134  |
|                                                                    |                         | EP231X: Perfluorotridecanoic acid (PFTrDA)                        | 72629-94-8  | 0.25 µg/L                | 108              | 65.0                  | 144  |
|                                                                    |                         | EP231X: Perfluorotetradecanoic acid (PFTeDA)                      | 376-06-7    | 0.625 µg/L               | 112              | 71.0                  | 132  |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4051169)               |                         |                                                                   |             |                          |                  |                       |      |
| EP2114394-006                                                      | 0960_MW146_3-3.5_211124 | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.25 µg/L                | 111              | 67.0                  | 137  |
|                                                                    |                         | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.625 µg/L               | 74.4             | 68.0                  | 141  |
|                                                                    |                         | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.625 µg/L               | 88.6             | 62.6                  | 147  |
|                                                                    |                         | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.625 µg/L               | 106              | 66.0                  | 145  |
|                                                                    |                         | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.625 µg/L               | 101              | 57.6                  | 145  |
|                                                                    |                         | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9   | 0.25 µg/L                | 115              | 65.0                  | 136  |
|                                                                    |                         | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.25 µg/L                | 129              | 61.0                  | 135  |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4051169)        |                         |                                                                   |             |                          |                  |                       |      |
| EP2114394-006                                                      | 0960_MW146_3-3.5_211124 | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.25 µg/L                | 110              | 63.0                  | 143  |
|                                                                    |                         | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 27619-97-2  | 0.25 µg/L                | 131              | 64.0                  | 140  |
|                                                                    |                         | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | 39108-34-4  | 0.25 µg/L                | 118              | 67.0                  | 138  |
|                                                                    |                         | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | 120226-60-0 | 0.25 µg/L                | 92.8             | 71.4                  | 144  |



## QA/QC Compliance Assessment to assist with Quality Review

Work Order : EP2114394

Page : 1 of 5

Client : CARDNO (WA) PTY LTD

Laboratory : Environmental Division Perth

Contact : [REDACTED]

Telephone : +61-8-9406 1301

Project : WA\_0960\_PFASOMP

Date Samples Received : 26-Nov-2021

Site : DEF19009/Learmonth

Issue Date : 07-Dec-2021

Sampler : [REDACTED]

No. of samples received : 8

Order number : DEF19009/0960

No. of samples analysed : 8

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

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

### Summary of Outliers

#### Outliers : Quality Control Samples

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

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

#### Outliers : Analysis Holding Time Compliance

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

#### Outliers : Frequency of Quality Control Samples

- **NO** Quality Control Sample Frequency Outliers exist.

*Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes*

| Compound Group Name                             | Laboratory Sample ID | Client Sample ID        | Analyte                               | CAS Number | Data           | Limits | Comment                                                                                      |
|-------------------------------------------------|----------------------|-------------------------|---------------------------------------|------------|----------------|--------|----------------------------------------------------------------------------------------------|
| <b>Matrix Spike (MS) Recoveries</b>             |                      |                         |                                       |            |                |        |                                                                                              |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA | EP2114394--001       | 0960_MW145_5-5.5_211124 | <b>Sulfate as SO4 - Turbidimetric</b> | 14808-79-8 | Not Determined | ----   | <b>MS recovery not determined, background level greater than or equal to 4x spike level.</b> |
| ED045G: Chloride by Discrete Analyser           | EP2114394--001       | 0960_MW145_5-5.5_211124 | <b>Chloride</b>                       | 16887-00-6 | Not Determined | ----   | <b>MS recovery not determined, background level greater than or equal to 4x spike level.</b> |

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.

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                          | Sample Date               | Extraction / Preparation |                    |            | Analysis      |                  |             |   |
|-------------------------------------------------|---------------------------|--------------------------|--------------------|------------|---------------|------------------|-------------|---|
| Container / Client Sample ID(s)                 |                           | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation  |   |
| ED037P: Alkalinity by PC Titrator               |                           |                          |                    |            |               |                  |             |   |
| Clear Plastic Bottle - Natural (ED037-P)        |                           |                          |                    |            |               |                  |             |   |
| 0960_MW145_5-5.5_211124,                        | 0960_MW138_3-3.5_211124,  | 24-Nov-2021              | ----               | ----       | ----          | 03-Dec-2021      | 08-Dec-2021 | ✓ |
| 0960_MW137_2.5-3_211124,                        | 0960_MW146_3-3.5_211124,  |                          |                    |            |               |                  |             |   |
| 0960_MW180_3.5-4_211124,                        | 0960_MW179_3.2-3.7_211124 |                          |                    |            |               |                  |             |   |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA |                           |                          |                    |            |               |                  |             |   |
| Clear Plastic Bottle - Natural (ED041G)         |                           |                          |                    |            |               |                  |             |   |
| 0960_MW145_5-5.5_211124,                        | 0960_MW138_3-3.5_211124,  | 24-Nov-2021              | ----               | ----       | ----          | 02-Dec-2021      | 22-Dec-2021 | ✓ |
| 0960_MW137_2.5-3_211124,                        | 0960_MW146_3-3.5_211124,  |                          |                    |            |               |                  |             |   |
| 0960_MW180_3.5-4_211124,                        | 0960_MW179_3.2-3.7_211124 |                          |                    |            |               |                  |             |   |
| ED045G: Chloride by Discrete Analyser           |                           |                          |                    |            |               |                  |             |   |
| Clear Plastic Bottle - Natural (ED045G)         |                           |                          |                    |            |               |                  |             |   |
| 0960_MW145_5-5.5_211124,                        | 0960_MW138_3-3.5_211124,  | 24-Nov-2021              | ----               | ----       | ----          | 02-Dec-2021      | 22-Dec-2021 | ✓ |
| 0960_MW137_2.5-3_211124,                        | 0960_MW146_3-3.5_211124,  |                          |                    |            |               |                  |             |   |
| 0960_MW180_3.5-4_211124,                        | 0960_MW179_3.2-3.7_211124 |                          |                    |            |               |                  |             |   |
| ED093F: Dissolved Major Cations                 |                           |                          |                    |            |               |                  |             |   |
| Clear Plastic Bottle - Natural (ED093F)         |                           |                          |                    |            |               |                  |             |   |
| 0960_MW145_5-5.5_211124,                        | 0960_MW138_3-3.5_211124,  | 24-Nov-2021              | ----               | ----       | ----          | 01-Dec-2021      | 01-Dec-2021 | ✓ |
| 0960_MW137_2.5-3_211124,                        | 0960_MW146_3-3.5_211124,  |                          |                    |            |               |                  |             |   |
| 0960_MW180_3.5-4_211124,                        | 0960_MW179_3.2-3.7_211124 |                          |                    |            |               |                  |             |   |



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                                                                                                                  | Sample Date                                                                                       | Extraction / Preparation |                    |             | Analysis      |                  |             |   |
|-----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|--------------------------|--------------------|-------------|---------------|------------------|-------------|---|
| Container / Client Sample ID(s)                                                                                                         |                                                                                                   | Date extracted           | Due for extraction | Evaluation  | Date analysed | Due for analysis | Evaluation  |   |
| EP231A: Perfluoroalkyl Sulfonic Acids                                                                                                   |                                                                                                   |                          |                    |             |               |                  |             |   |
| HDPE (no PTFE) (EP231X)<br>0960_MW145_5-5.5_211124,<br>0960_MW138_3-3.5_211124,<br>0960_MW137_2.5-3_211124,<br>0960_MW180_3.5-4_211124, | 0960_QC118_211124,<br>0960_QC120_211124,<br>0960_MW146_3-3.5_211124,<br>0960_MW179_3.2-3.7_211124 | 24-Nov-2021              | 02-Dec-2021        | 23-May-2022 | ✔             | 03-Dec-2021      | 23-May-2022 | ✔ |
| EP231B: Perfluoroalkyl Carboxylic Acids                                                                                                 |                                                                                                   |                          |                    |             |               |                  |             |   |
| HDPE (no PTFE) (EP231X)<br>0960_MW145_5-5.5_211124,<br>0960_MW138_3-3.5_211124,<br>0960_MW137_2.5-3_211124,<br>0960_MW180_3.5-4_211124, | 0960_QC118_211124,<br>0960_QC120_211124,<br>0960_MW146_3-3.5_211124,<br>0960_MW179_3.2-3.7_211124 | 24-Nov-2021              | 02-Dec-2021        | 23-May-2022 | ✔             | 03-Dec-2021      | 23-May-2022 | ✔ |
| EP231C: Perfluoroalkyl Sulfonamides                                                                                                     |                                                                                                   |                          |                    |             |               |                  |             |   |
| HDPE (no PTFE) (EP231X)<br>0960_MW145_5-5.5_211124,<br>0960_MW138_3-3.5_211124,<br>0960_MW137_2.5-3_211124,<br>0960_MW180_3.5-4_211124, | 0960_QC118_211124,<br>0960_QC120_211124,<br>0960_MW146_3-3.5_211124,<br>0960_MW179_3.2-3.7_211124 | 24-Nov-2021              | 02-Dec-2021        | 23-May-2022 | ✔             | 03-Dec-2021      | 23-May-2022 | ✔ |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids                                                                                              |                                                                                                   |                          |                    |             |               |                  |             |   |
| HDPE (no PTFE) (EP231X)<br>0960_MW145_5-5.5_211124,<br>0960_MW138_3-3.5_211124,<br>0960_MW137_2.5-3_211124,<br>0960_MW180_3.5-4_211124, | 0960_QC118_211124,<br>0960_QC120_211124,<br>0960_MW146_3-3.5_211124,<br>0960_MW179_3.2-3.7_211124 | 24-Nov-2021              | 02-Dec-2021        | 23-May-2022 | ✔             | 03-Dec-2021      | 23-May-2022 | ✔ |
| EP231P: PFAS Sums                                                                                                                       |                                                                                                   |                          |                    |             |               |                  |             |   |
| HDPE (no PTFE) (EP231X)<br>0960_MW145_5-5.5_211124,<br>0960_MW138_3-3.5_211124,<br>0960_MW137_2.5-3_211124,<br>0960_MW180_3.5-4_211124, | 0960_QC118_211124,<br>0960_QC120_211124,<br>0960_MW146_3-3.5_211124,<br>0960_MW179_3.2-3.7_211124 | 24-Nov-2021              | 02-Dec-2021        | 23-May-2022 | ✔             | 03-Dec-2021      | 23-May-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                            |         | Count |         | Rate (%) |          |            | Quality Control Specification  |
|--------------------------------------------------------|---------|-------|---------|----------|----------|------------|--------------------------------|
| Analytical Methods                                     | Method  | QC    | Regular | Actual   | Expected | Evaluation |                                |
|                                                        |         |       |         |          |          |            |                                |
| Laboratory Duplicates (DUP)                            |         |       |         |          |          |            |                                |
| Alkalinity by PC Titrator                              | ED037-P | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 2     | 19      | 10.53    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Laboratory Control Samples (LCS)                       |         |       |         |          |          |            |                                |
| Alkalinity by PC Titrator                              | ED037-P | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 19      | 5.26     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Method Blanks (MB)                                     |         |       |         |          |          |            |                                |
| Alkalinity by PC Titrator                              | ED037-P | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 19      | 5.26     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Matrix Spikes (MS)                                     |         |       |         |          |          |            |                                |
| Chloride by Discrete Analyser                          | ED045G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 19      | 5.26     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |





## Brief Method Summaries

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

| Analytical Methods                                                 | Method       | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------------------|--------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alkalinity by PC Titrator                                          | ED037-P      | WATER  | In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                                                                                                                                                                                                                |
| Sulfate (Turbidimetric) as SO <sub>4</sub> 2- by Discrete Analyser | ED041G       | WATER  | In house: Referenced to APHA 4500-SO <sub>4</sub> . Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO <sub>4</sub> suspension is measured by a photometer and the SO <sub>4</sub> -2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                         |
| Chloride by Discrete Analyser                                      | ED045G       | WATER  | In house: Referenced to APHA 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA seal method 2 017-1-L                                                                                                                                                                                                                                                                                                                                      |
| Major Cations - Dissolved                                          | ED093F       | WATER  | In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                           |
| Ionic Balance by PCT DA and Turbi SO <sub>4</sub> DA               | * EN055 - PG | WATER  | In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS               | EP231X       | WATER  | In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements. |
| Preparation Methods                                                | Method       | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Solid Phase Extraction (SPE) for PFAS in water                     | ORG72        | WATER  | In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.                                                                                                                                                                                                |



# CHAIN OF CUSTODY

COC#: 30626

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: MG - DEF19009/Learmonth GW

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:

/ ES2019CARBSD0002

## LABORATORY USE ONLY (Circle)

Custody Seal intact?

Yes 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 | Ground Waters Primary WATER | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|-------------------|-------------|---------------------|--------|----------------------|---------|-----------------------------|----------------------|------------------------|
| 001    | 0960_MW021_211124 |             | 24/11/2021 11:15 AM | Water  | ALS: 4<br>Non ALS: 0 | No      | Partial 4/8                 |                      |                        |
| 002    | 0960_MW114_211124 |             | 24/11/2021 11:39 AM | Water  | ALS: 4<br>Non ALS: 0 | No      | Partial 4/8                 |                      |                        |
| 003    | 0960_MW233_211124 |             | 24/11/2021 12:09 PM | Water  | ALS: 4<br>Non ALS: 0 | No      | Partial 4/8                 |                      |                        |
| 004    | 0960_QC124_211124 |             | 24/11/2021 12:10 PM | Water  | ALS: 2<br>Non ALS: 0 | No      | Partial 1/8                 |                      |                        |
| 005    | 0960_MW162_211124 |             | 24/11/2021 01:10 PM | Water  | ALS: 4<br>Non ALS: 0 | No      | Partial 4/8                 |                      |                        |
| 006    | 0960_MW113_211124 |             | 24/11/2021 01:27 PM | Water  | ALS: 4<br>Non ALS: 0 | No      | Partial 4/8                 |                      |                        |
| 007    | 0960_QC127_211124 |             | 24/11/2021 02:06 PM | Water  | ALS: 2<br>Non ALS: 0 | No      | Partial 1/8                 |                      |                        |
| 008    | 0960_MW168_211124 |             | 24/11/2021 02:07 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8                 |                      |                        |
| 009    | 0960_MW167_211124 |             | 24/11/2021 02:22 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8                 |                      |                        |



# CHAIN OF CUSTODY

COC#: 30626

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: MG - DEF19009/Learmonth GW

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:

/ ES2019CARBSD0002

## LABORATORY USE ONLY (Circle)

Custody Seal intact?

Yes 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 | Ground Waters Primary WATER | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|-------------------|-------------|---------------------|--------|----------------------|---------|-----------------------------|----------------------|------------------------|
| 010    | 0960_MW166_211124 |             | 24/11/2021 02:41 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8                 |                      |                        |
| 011    | 0960_MW165_211124 |             | 24/11/2021 02:58 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8                 |                      |                        |
| 012    | 0960_MW163_211124 |             | 24/11/2021 03:41 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8                 |                      |                        |

# CHAIN OF CUSTODY

ALS COC#: 30626 ALS Laboratory: EP Perth

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

SAMPLER MOBILE:  
/ ES2019CARBSD0002

## LABORATORY USE ONLY (Circle)

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

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: MG - DEF19009/Learmonth GW

ORDER NO: DEF19009/0960

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

| SAMPLE | SAMPLE NAME       | PARTIAL ANALYSIS GROUP NAME | MATRIX | SELECTED ANALYSIS NAME                                                                                                                                                                                      |
|--------|-------------------|-----------------------------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 001    | 0960_MW021_211124 | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 002    | 0960_MW114_211124 | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 003    | 0960_MW233_211124 | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 004    | 0960_QC124_211124 | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 005    | 0960_MW162_211124 | Ground Waters Primary WATER | Water  | - EP231X PFAS - Full Suite (28 analytes)                                                                                                                                                                    |
| 006    | 0960_MW113_211124 | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 007    | 0960_QC127_211124 | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 008    | 0960_MW168_211124 | Ground Waters Primary WATER | Water  | - EP231X PFAS - Full Suite (28 analytes)                                                                                                                                                                    |
| 009    | 0960_MW167_211124 | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 010    | 0960_MW166_211124 | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |





# CHAIN OF CUSTODY

ALS COC#: 30626

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: MG - DEF19009/Learmonth GW

ORDER NO: DEF19009/0960

PROJECT MANAGER

PRIMARY SAMPLER

EMAIL REPORTS TO

EMAIL INVOICES TO

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

SAMPLER MOBILE:  
/ ES2019CARBSD0002

## LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

|     |                   |                             |       |                                                                                                                                                                                                                                                                                |
|-----|-------------------|-----------------------------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 011 | 0960_MW165_211124 | Ground Waters Primary WATER | Water | <ul style="list-style-type: none"><li>- NT-02 Major Anions (Chloride, Sulphate, Alkalinity)</li><li>- NT-01 Major Cations (Ca, Mg, Na, K)</li><li>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &amp; ED093F</li><li>- EP231X PFAS - Full Suite (28 analytes)</li></ul> |
| 012 | 0960_MW163_211124 | Ground Waters Primary WATER | Water | <ul style="list-style-type: none"><li>- NT-02 Major Anions (Chloride, Sulphate, Alkalinity)</li><li>- NT-01 Major Cations (Ca, Mg, Na, K)</li><li>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &amp; ED093F</li><li>- EP231X PFAS - Full Suite (28 analytes)</li></ul> |



# CHAIN OF CUSTODY

COC#: 30626

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: MG - DEF19009/Learmonth GW

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:  
/ ES2019CARBSD0002

## LABORATORY USE ONLY (Circle)

Custody Seal intact?

Yes 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    | 0960_MW021_211124 | HDPE (no PTFE)                 | 20 mL  | 00352010039956 | Grey  | No       |        |
| 001    | 0960_MW021_211124 | HDPE (no PTFE)                 | 20 mL  | 00352010040044 | Grey  | No       |        |
| 001    | 0960_MW021_211124 | Clear Plastic Bottle - Natural | 250 mL | 00070220143102 | Green | No       |        |
| 001    | 0960_MW021_211124 | Clear Plastic Bottle - Natural | 250 mL | 00070220143178 | Green | No       |        |
| 002    | 0960_MW114_211124 | Clear Plastic Bottle - Natural | 250 mL | 00070220143204 | Green | No       |        |
| 002    | 0960_MW114_211124 | Clear Plastic Bottle - Natural | 250 mL | 00070220143069 | Green | No       |        |
| 002    | 0960_MW114_211124 | HDPE (no PTFE)                 | 20 mL  | 00352010039969 | Grey  | No       |        |
| 002    | 0960_MW114_211124 | HDPE (no PTFE)                 | 20 mL  | 00352010039962 | Grey  | No       |        |
| 003    | 0960_MW233_211124 | Clear Plastic Bottle - Natural | 250 mL | 00070220142426 | Green | No       |        |
| 003    | 0960_MW233_211124 | HDPE (no PTFE)                 | 20 mL  | 00352010040244 | Grey  | No       |        |
| 003    | 0960_MW233_211124 | HDPE (no PTFE)                 | 20 mL  | 00352005019872 | Grey  | No       |        |
| 003    | 0960_MW233_211124 | Clear Plastic Bottle - Natural | 250 mL | 00070220142755 | Green | No       |        |
| 004    | 0960_QC124_211124 | HDPE (no PTFE)                 | 20 mL  | 00350019035043 | Grey  | No       |        |
| 004    | 0960_QC124_211124 | HDPE (no PTFE)                 | 20 mL  | 00350019035154 | Grey  | No       |        |
| 005    | 0960_MW162_211124 | Clear Plastic Bottle - Natural | 250 mL | 00070220142803 | Green | No       |        |
| 005    | 0960_MW162_211124 | HDPE (no PTFE)                 | 20 mL  | 00352010040030 | Grey  | No       |        |
| 005    | 0960_MW162_211124 | Clear Plastic Bottle - Natural | 250 mL | 00070220142661 | Green | No       |        |
| 005    | 0960_MW162_211124 | HDPE (no PTFE)                 | 20 mL  | 00352010040146 | Grey  | No       |        |
| 006    | 0960_MW113_211124 | Clear Plastic Bottle - Natural | 250 mL | 00070220142866 | Green | No       |        |
| 006    | 0960_MW113_211124 | HDPE (no PTFE)                 | 20 mL  | 00352010040166 | Grey  | No       |        |
| 006    | 0960_MW113_211124 | HDPE (no PTFE)                 | 20 mL  | 00352010040109 | Grey  | No       |        |
| 006    | 0960_MW113_211124 | Clear Plastic Bottle - Natural | 250 mL | 00070220142380 | Green | No       |        |
| 007    | 0960_QC127_211124 | HDPE (no PTFE)                 | 20 mL  | 00350019177534 | Grey  | No       |        |
| 007    | 0960_QC127_211124 | HDPE (no PTFE)                 | 20 mL  | 00350019177434 | Grey  | No       |        |
| 008    | 0960_MW168_211124 | HDPE (no PTFE)                 | 20 mL  | 00352101071754 | Grey  | No       |        |
| 008    | 0960_MW168_211124 | HDPE (no PTFE)                 | 20 mL  | 00352101071969 | Grey  | No       |        |

Wednesday, November 24, 2021

12:44:57 PM

# CHAIN OF CUSTODY

ALS COC#: 30626 ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: MG - DEF19009/Learmonth GW

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:  
/ ES2019CARBSD0002

## LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

|     |                   |                                |        |                |       |    |  |
|-----|-------------------|--------------------------------|--------|----------------|-------|----|--|
| 008 | 0960_MW168_211124 | Clear Plastic Bottle - Natural | 250 mL | 00070621051579 | Green | No |  |
| 009 | 0960_MW167_211124 | HDPE (no PTFE)                 | 20 mL  | 00352101071903 | Grey  | No |  |
| 009 | 0960_MW167_211124 | HDPE (no PTFE)                 | 20 mL  | 00352101071327 | Grey  | No |  |
| 009 | 0960_MW167_211124 | Clear Plastic Bottle - Natural | 250 mL | 00070621197264 | Green | No |  |
| 010 | 0960_MW166_211124 | HDPE (no PTFE)                 | 20 mL  | 00352101071621 | Grey  | No |  |
| 010 | 0960_MW166_211124 | HDPE (no PTFE)                 | 20 mL  | 00352101038044 | Grey  | No |  |
| 010 | 0960_MW166_211124 | Clear Plastic Bottle - Natural | 250 mL | 00070621197266 | Green | No |  |
| 011 | 0960_MW165_211124 | HDPE (no PTFE)                 | 20 mL  | 00352101071738 | Grey  | No |  |
| 011 | 0960_MW165_211124 | Clear Plastic Bottle - Natural | 250 mL | 00070621191161 | Green | No |  |
| 011 | 0960_MW165_211124 | HDPE (no PTFE)                 | 20 mL  | 00352101071687 | Grey  | No |  |
| 012 | 0960_MW163_211124 | HDPE (no PTFE)                 | 20 mL  | 00352101071924 | Grey  | No |  |
| 012 | 0960_MW163_211124 | Clear Plastic Bottle - Natural | 250 mL | 00070621197272 | Green | No |  |
| 012 | 0960_MW163_211124 | HDPE (no PTFE)                 | 20 mL  | 00352101071286 | Grey  | No |  |

Total Bottle Count: ALS: 39, Non ALS: 0

## SAMPLE RECEIPT NOTIFICATION (SRN)

**Work Order : EP2114395**

|                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Client : <b>CARDNO (WA) PTY LTD</b></p> <p>Contact : [REDACTED]</p> <p>Address : 11 HARVEST TERRACE PO BOX 155<br/>WEST PERTH WA, AUSTRALIA 6006</p> <p>E-mail : [REDACTED]@cardno.com.au</p> <p>Telephone : ----</p> <p>Facsimile : ----</p> <p>Project : WA_0960_PFASOMP</p> <p>Order number : DEF19009/0960</p> <p>C-O-C number : 30626</p> <p>Site : DEF19009/Learmonth</p> <p>Sampler : [REDACTED]</p> | <p>Laboratory : Environmental Division Perth</p> <p>Contact : [REDACTED]</p> <p>Address : 26 Rigali Way Wangara WA Australia<br/>6065</p> <p>E-mail : [REDACTED]@alsglobal.com</p> <p>Telephone : +61-8-9406 1301</p> <p>Facsimile : +61-8-9406 1399</p> <p>Page : 1 of 2</p> <p>Quote number : ES2019CARBSD0002 (SY/139/19)</p> <p>QC Level : NEPM 2013 B3 &amp; ALS QC Standard</p> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Dates

|                                           |                                               |
|-------------------------------------------|-----------------------------------------------|
| Date Samples Received : 26-Nov-2021 09:55 | Issue Date : 26-Nov-2021                      |
| Client Requested Due Date : 08-Dec-2021   | Scheduled Reporting Date : <b>08-Dec-2021</b> |

### Delivery Details

|                             |                                              |
|-----------------------------|----------------------------------------------|
| Mode of Delivery : Carrier  | Security Seal : Not Available                |
| No. of coolers/boxes : 3    | Temperature : 24.8 - Ice present             |
| Receipt Detail : Ice Melted | No. of samples received / analysed : 12 / 12 |

### General Comments

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





## Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exists.

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

| Laboratory sample ID | Sampling date / time | Sample ID         | WATER - EN055 - PG<br>Ionic Balance by ED037P, ED041G, ED045G &<br>WATER - EP231X<br>PFAS - Full Suite (28 analytes) | WATER - NT-01<br>Major Cations (Ca, Mg, Na, K) | WATER - NT-02<br>Major Anions (Chloride, Sulphate, Alkalinity) |
|----------------------|----------------------|-------------------|----------------------------------------------------------------------------------------------------------------------|------------------------------------------------|----------------------------------------------------------------|
| EP2114395-001        | 24-Nov-2021 11:15    | 0960_MW021_211124 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114395-002        | 24-Nov-2021 11:39    | 0960_MW114_211124 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114395-003        | 24-Nov-2021 12:09    | 0960_MW233_211124 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114395-004        | 24-Nov-2021 12:10    | 0960_QC124_211124 |                                                                                                                      | ✓                                              |                                                                |
| EP2114395-005        | 24-Nov-2021 13:10    | 0960_MW162_211124 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114395-006        | 24-Nov-2021 13:27    | 0960_MW113_211124 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114395-007        | 24-Nov-2021 14:06    | 0960_QC127_211124 |                                                                                                                      | ✓                                              |                                                                |
| EP2114395-008        | 24-Nov-2021 14:07    | 0960_MW168_211124 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114395-009        | 24-Nov-2021 14:22    | 0960_MW167_211124 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114395-010        | 24-Nov-2021 14:41    | 0960_MW166_211124 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114395-011        | 24-Nov-2021 14:58    | 0960_MW165_211124 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114395-012        | 24-Nov-2021 15:41    | 0960_MW163_211124 | ✓                                                                                                                    | ✓                                              | ✓                                                              |

## Proactive Holding Time Report

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

## Requested Deliverables

|                                                                                                                  |       |                              |
|------------------------------------------------------------------------------------------------------------------|-------|------------------------------|
| <ul style="list-style-type: none"> <li>- A4 - AU Tax Invoice (INV)</li> </ul>                                    | Email | cardno.com.au                |
| <b>DERP LAB REPORTS</b>                                                                                          |       |                              |
| <ul style="list-style-type: none"> <li>- EDI Format - ESDAT (ESDAT)</li> </ul>                                   | Email | derp.labreports@esdat.com.au |
| <ul style="list-style-type: none"> <li>- *AU Certificate of Analysis - NATA (COA)</li> </ul>                     | Email | cardno.com.au                |
| <ul style="list-style-type: none"> <li>- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)</li> </ul>    | Email | cardno.com.au                |
| <ul style="list-style-type: none"> <li>- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)</li> </ul>            | Email | cardno.com.au                |
| <ul style="list-style-type: none"> <li>- A4 - AU Sample Receipt Notification - Environmental HT (SRN)</li> </ul> | Email | cardno.com.au                |
| <ul style="list-style-type: none"> <li>- Chain of Custody (CoC) (COC)</li> </ul>                                 | Email | cardno.com.au                |
| <ul style="list-style-type: none"> <li>- EDI Format - ESDAT (ESDAT)</li> </ul>                                   | Email | cardno.com.au                |
| <ul style="list-style-type: none"> <li>- EDI Format - XTab (XTAB)</li> </ul>                                     | Email | cardno.com.au                |
| <b>Perth</b>                                                                                                     |       |                              |
| <ul style="list-style-type: none"> <li>- A4 - AU Tax Invoice (INV)</li> </ul>                                    | Email | perth@cardno.com.au          |

## CERTIFICATE OF ANALYSIS

**Work Order** : **EP2114395**  
**Client** : **CARDNO (WA) PTY LTD**  
**Contact** : [REDACTED]  
**Address** : 11 HARVEST TERRACE PO BOX 155  
 WEST PERTH WA, AUSTRALIA 6006  
**Telephone** : ----  
**Project** : WA\_0960\_PFASOMP  
**Order number** : DEF19009/0960  
**C-O-C number** : 30626  
**Sampler** : [REDACTED]  
**Site** : DEF19009/Learmonth  
**Quote number** : SY/139/19  
**No. of samples received** : 12  
**No. of samples analysed** : 12

**Page** : 1 of 12  
**Laboratory** : Environmental Division Perth  
**Contact** : [REDACTED]  
**Address** : 26 Rigali Way Wangara WA Australia 6065  
**Telephone** : +61-8-9406 1301  
**Date Samples Received** : 26-Nov-2021 09:55  
**Date Analysis Commenced** : 01-Dec-2021  
**Issue Date** : 07-Dec-2021 20:07



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>    |
|------------------------------------------------------------------------|----------------------------|----------------------------------|
| <span style="background-color: black; color: black;">[REDACTED]</span> | Laboratory Manager (Perth) | Perth Inorganics, Wangara, WA    |
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator           | Sydney Organics, Smithfield, NSW |



## 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.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- EP231X: Positive result for analyte Perfluorooctane sulfonic acid (PFOS) on sample EP2114395\_011 has been confirmed by re-extraction and re-analysis.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, 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: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                        |             |      |       | 0960_MW021_211124 | 0960_MW114_211124 | 0960_MW233_211124 | 0960_QC124_211124 | 0960_MW162_211124 |
|--------------------------------------------------------|-------------|------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                   |             |      |       | 24-Nov-2021 11:15 | 24-Nov-2021 11:39 | 24-Nov-2021 12:09 | 24-Nov-2021 12:10 | 24-Nov-2021 13:10 |
| Compound                                               | CAS Number  | LOR  | Unit  | EP2114395-001     | EP2114395-002     | EP2114395-003     | EP2114395-004     | EP2114395-005     |
|                                                        |             |      |       | Result            | Result            | Result            | Result            | Result            |
| <b>ED037P: Alkalinity by PC Titrator</b>               |             |      |       |                   |                   |                   |                   |                   |
| Hydroxide Alkalinity as CaCO3                          | DMO-210-001 | 1    | mg/L  | <1                | <1                | <1                | ----              | <1                |
| Carbonate Alkalinity as CaCO3                          | 3812-32-6   | 1    | mg/L  | <1                | <1                | 10                | ----              | <1                |
| Bicarbonate Alkalinity as CaCO3                        | 71-52-3     | 1    | mg/L  | 999               | 469               | 585               | ----              | 496               |
| Total Alkalinity as CaCO3                              | ----        | 1    | mg/L  | 999               | 469               | 595               | ----              | 496               |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b> |             |      |       |                   |                   |                   |                   |                   |
| Sulfate as SO4 - Turbidimetric                         | 14808-79-8  | 1    | mg/L  | 121               | 275               | 32                | ----              | 411               |
| <b>ED045G: Chloride by Discrete Analyser</b>           |             |      |       |                   |                   |                   |                   |                   |
| Chloride                                               | 16887-00-6  | 1    | mg/L  | 659               | 2500              | 207               | ----              | 3830              |
| <b>ED093F: Dissolved Major Cations</b>                 |             |      |       |                   |                   |                   |                   |                   |
| Calcium                                                | 7440-70-2   | 1    | mg/L  | 4                 | 116               | 3                 | ----              | 184               |
| Magnesium                                              | 7439-95-4   | 1    | mg/L  | 8                 | 112               | 2                 | ----              | 222               |
| Sodium                                                 | 7440-23-5   | 1    | mg/L  | 753               | 1610              | 335               | ----              | 2200              |
| Potassium                                              | 7440-09-7   | 1    | mg/L  | 22                | 55                | 11                | ----              | 118               |
| <b>EN055: Ionic Balance</b>                            |             |      |       |                   |                   |                   |                   |                   |
| ∅ Total Anions                                         | ----        | 0.01 | meq/L | 41.1              | 85.6              | 18.4              | ----              | 126               |
| ∅ Total Cations                                        | ----        | 0.01 | meq/L | 34.2              | 86.4              | 15.2              | ----              | 126               |
| ∅ Ionic Balance                                        | ----        | 0.01 | %     | 9.16              | 0.48              | 9.61              | ----              | 0.14              |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>           |             |      |       |                   |                   |                   |                   |                   |
| Perfluorobutane sulfonic acid (PFBS)                   | 375-73-5    | 0.02 | µg/L  | 0.17              | <0.02             | 0.08              | 0.09              | 0.66              |
| Perfluoropentane sulfonic acid (PFPeS)                 | 2706-91-4   | 0.02 | µg/L  | 0.14              | <0.02             | 0.10              | 0.11              | 0.55              |
| Perfluorohexane sulfonic acid (PFHxS)                  | 355-46-4    | 0.01 | µg/L  | 1.04              | <0.01             | 2.08              | 2.19              | 3.79              |
| Perfluoroheptane sulfonic acid (PFHpS)                 | 375-92-8    | 0.02 | µg/L  | <0.02             | <0.02             | 0.18              | 0.16              | 0.04              |
| Perfluorooctane sulfonic acid (PFOS)                   | 1763-23-1   | 0.01 | µg/L  | 0.42              | <0.01             | 2.11              | 1.91              | 0.29              |
| Perfluorodecane sulfonic acid (PFDS)                   | 335-77-3    | 0.02 | µg/L  | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>         |             |      |       |                   |                   |                   |                   |                   |
| 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  | 0.05              | <0.02             | 0.05              | 0.05              | 0.28              |
| Perfluorohexanoic acid (PFHxA)                         | 307-24-4    | 0.02 | µg/L  | 0.25              | <0.02             | 0.28              | 0.26              | 1.46              |
| Perfluoroheptanoic acid (PFHpA)                        | 375-85-9    | 0.02 | µg/L  | 0.03              | <0.02             | 0.04              | 0.03              | 0.10              |





## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_MW021_211124 | 0960_MW114_211124 | 0960_MW233_211124 | 0960_QC124_211124 | 0960_MW162_211124 |
|------------------------------------------------------------|-------------|------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                       |             |      |      | 24-Nov-2021 11:15 | 24-Nov-2021 11:39 | 24-Nov-2021 12:09 | 24-Nov-2021 12:10 | 24-Nov-2021 13:10 |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2114395-001     | EP2114395-002     | EP2114395-003     | EP2114395-004     | EP2114395-005     |
|                                                            |             |      |      | Result            | Result            | Result            | Result            | Result            |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                   |                   |                   |                   |                   |
| Perfluorooctanoic acid (PFOA)                              | 335-67-1    | 0.01 | µg/L | 0.02              | <0.01             | 0.22              | 0.21              | 0.09              |
| 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             |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                   |                   |                   |                   |                   |
| Perfluorooctane sulfonamide (FOSA)                         | 754-91-6    | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)              | 31506-32-8  | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)               | 4151-50-2   | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)       | 24448-09-7  | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)        | 1691-99-2   | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)  | 2355-31-9   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)   | 2991-50-6   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                   |                   |                   |                   |                   |
| 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             |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_MW021_211124 | 0960_MW114_211124 | 0960_MW233_211124 | 0960_QC124_211124 | 0960_MW162_211124 |
|---------------------------------------------------------------|--------------------|------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                          |                    |      |      | 24-Nov-2021 11:15 | 24-Nov-2021 11:39 | 24-Nov-2021 12:09 | 24-Nov-2021 12:10 | 24-Nov-2021 13:10 |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2114395-001     | EP2114395-002     | EP2114395-003     | EP2114395-004     | EP2114395-005     |
|                                                               |                    |      |      | Result            | Result            | Result            | Result            | Result            |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                   |                   |                   |                   |                   |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                   |                   |                   |                   |                   |
| Sum of PFAS                                                   | ----               | 0.01 | µg/L | 2.12              | <0.01             | 5.14              | 5.01              | 7.36              |
| Sum of PFHxS and PFOS                                         | 355-46-4/1763-23-1 | 0.01 | µg/L | 1.46              | <0.01             | 4.19              | 4.10              | 4.08              |
| Sum of PFAS (WA DER List)                                     | ----               | 0.01 | µg/L | 1.98              | <0.01             | 4.86              | 4.74              | 6.77              |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 110               | 113               | 112               | 111               | 113               |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 107               | 110               | 117               | 117               | 110               |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                        |             |      |       | 0960_MW113_211124 | 0960_QC127_211124 | 0960_MW168_211124 | 0960_MW167_211124 | 0960_MW166_211124 |
|--------------------------------------------------------|-------------|------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                   |             |      |       | 24-Nov-2021 13:27 | 24-Nov-2021 14:06 | 24-Nov-2021 14:07 | 24-Nov-2021 14:22 | 24-Nov-2021 14:41 |
| Compound                                               | CAS Number  | LOR  | Unit  | EP2114395-006     | EP2114395-007     | EP2114395-008     | EP2114395-009     | EP2114395-010     |
|                                                        |             |      |       | Result            | Result            | Result            | Result            | Result            |
| <b>ED037P: Alkalinity by PC Titrator</b>               |             |      |       |                   |                   |                   |                   |                   |
| Hydroxide Alkalinity as CaCO3                          | DMO-210-001 | 1    | mg/L  | <1                | ----              | <1                | <1                | <1                |
| Carbonate Alkalinity as CaCO3                          | 3812-32-6   | 1    | mg/L  | <1                | ----              | <1                | <1                | <1                |
| Bicarbonate Alkalinity as CaCO3                        | 71-52-3     | 1    | mg/L  | 386               | ----              | 579               | 889               | 964               |
| Total Alkalinity as CaCO3                              | ----        | 1    | mg/L  | 386               | ----              | 579               | 889               | 964               |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b> |             |      |       |                   |                   |                   |                   |                   |
| Sulfate as SO4 - Turbidimetric                         | 14808-79-8  | 1    | mg/L  | 272               | ----              | 703               | 306               | 110               |
| <b>ED045G: Chloride by Discrete Analyser</b>           |             |      |       |                   |                   |                   |                   |                   |
| Chloride                                               | 16887-00-6  | 1    | mg/L  | 3070              | ----              | 3620              | 1050              | 378               |
| <b>ED093F: Dissolved Major Cations</b>                 |             |      |       |                   |                   |                   |                   |                   |
| Calcium                                                | 7440-70-2   | 1    | mg/L  | 210               | ----              | 179               | 20                | 4                 |
| Magnesium                                              | 7439-95-4   | 1    | mg/L  | 178               | ----              | 201               | 27                | 6                 |
| Sodium                                                 | 7440-23-5   | 1    | mg/L  | 1710              | ----              | 2290              | 1050              | 595               |
| Potassium                                              | 7440-09-7   | 1    | mg/L  | 66                | ----              | 98                | 40                | 23                |
| <b>EN055: Ionic Balance</b>                            |             |      |       |                   |                   |                   |                   |                   |
| ∅ Total Anions                                         | ----        | 0.01 | meq/L | 100               | ----              | 128               | 53.8              | 32.2              |
| ∅ Total Cations                                        | ----        | 0.01 | meq/L | 101               | ----              | 128               | 49.9              | 27.2              |
| ∅ Ionic Balance                                        | ----        | 0.01 | %     | 0.61              | ----              | 0.28              | 3.70              | 8.51              |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>           |             |      |       |                   |                   |                   |                   |                   |
| Perfluorobutane sulfonic acid (PFBS)                   | 375-73-5    | 0.02 | µg/L  | <0.02             | 0.13              | 0.13              | 0.07              | 0.10              |
| Perfluoropentane sulfonic acid (PFPeS)                 | 2706-91-4   | 0.02 | µg/L  | <0.02             | 0.12              | 0.13              | 0.08              | 0.06              |
| Perfluorohexane sulfonic acid (PFHxS)                  | 355-46-4    | 0.01 | µg/L  | <0.01             | 1.18              | 1.22              | 1.50              | 0.48              |
| Perfluoroheptane sulfonic acid (PFHpS)                 | 375-92-8    | 0.02 | µg/L  | <0.02             | <0.02             | <0.02             | 0.06              | <0.02             |
| Perfluorooctane sulfonic acid (PFOS)                   | 1763-23-1   | 0.01 | µg/L  | <0.01             | 0.13              | 0.12              | 1.08              | 0.47              |
| Perfluorodecane sulfonic acid (PFDS)                   | 335-77-3    | 0.02 | µg/L  | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>         |             |      |       |                   |                   |                   |                   |                   |
| 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             | 0.08              | 0.09              | 0.12              | 0.20              |
| Perfluorohexanoic acid (PFHxA)                         | 307-24-4    | 0.02 | µg/L  | <0.02             | 0.42              | 0.45              | 0.40              | 0.33              |
| Perfluoroheptanoic acid (PFHpA)                        | 375-85-9    | 0.02 | µg/L  | <0.02             | 0.04              | 0.04              | 0.11              | 0.17              |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_MW113_211124 | 0960_QC127_211124 | 0960_MW168_211124 | 0960_MW167_211124 | 0960_MW166_211124 |
|------------------------------------------------------------|-------------|------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                       |             |      |      | 24-Nov-2021 13:27 | 24-Nov-2021 14:06 | 24-Nov-2021 14:07 | 24-Nov-2021 14:22 | 24-Nov-2021 14:41 |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2114395-006     | EP2114395-007     | EP2114395-008     | EP2114395-009     | EP2114395-010     |
|                                                            |             |      |      | Result            | Result            | Result            | Result            | Result            |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                   |                   |                   |                   |                   |
| Perfluorooctanoic acid (PFOA)                              | 335-67-1    | 0.01 | µg/L | <0.01             | 0.03              | 0.04              | 0.17              | 0.14              |
| Perfluorononanoic acid (PFNA)                              | 375-95-1    | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| Perfluorodecanoic acid (PFDA)                              | 335-76-2    | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| Perfluoroundecanoic acid (PFUnDA)                          | 2058-94-8   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| Perfluorododecanoic acid (PFDoDA)                          | 307-55-1    | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| Perfluorotridecanoic acid (PFTrDA)                         | 72629-94-8  | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| Perfluorotetradecanoic acid (PFTeDA)                       | 376-06-7    | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                   |                   |                   |                   |                   |
| Perfluorooctane sulfonamide (FOSA)                         | 754-91-6    | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)              | 31506-32-8  | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)               | 4151-50-2   | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)       | 24448-09-7  | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)        | 1691-99-2   | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)  | 2355-31-9   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)   | 2991-50-6   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                   |                   |                   |                   |                   |
| 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             |





## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_MW113_211124 | 0960_QC127_211124 | 0960_MW168_211124 | 0960_MW167_211124 | 0960_MW166_211124 |
|---------------------------------------------------------------|--------------------|------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                          |                    |      |      | 24-Nov-2021 13:27 | 24-Nov-2021 14:06 | 24-Nov-2021 14:07 | 24-Nov-2021 14:22 | 24-Nov-2021 14:41 |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2114395-006     | EP2114395-007     | EP2114395-008     | EP2114395-009     | EP2114395-010     |
|                                                               |                    |      |      | Result            | Result            | Result            | Result            | Result            |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                   |                   |                   |                   |                   |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                   |                   |                   |                   |                   |
| Sum of PFAS                                                   | ----               | 0.01 | µg/L | <0.01             | 2.13              | 2.22              | 3.59              | 1.95              |
| Sum of PFHxS and PFOS                                         | 355-46-4/1763-23-1 | 0.01 | µg/L | <0.01             | 1.31              | 1.34              | 2.58              | 0.95              |
| Sum of PFAS (WA DER List)                                     | ----               | 0.01 | µg/L | <0.01             | 2.01              | 2.09              | 3.45              | 1.89              |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 108               | 100               | 106               | 102               | 113               |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 106               | 102               | 105               | 106               | 112               |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                        |             |      |       | 0960_MW165_211124 | 0960_MW163_211124 | ----  | ----  | ----  |
|--------------------------------------------------------|-------------|------|-------|-------------------|-------------------|-------|-------|-------|
| Sampling date / time                                   |             |      |       | 24-Nov-2021 14:58 | 24-Nov-2021 15:41 | ----  | ----  | ----  |
| Compound                                               | CAS Number  | LOR  | Unit  | EP2114395-011     | EP2114395-012     | ----- | ----- | ----- |
| Result                                                 |             |      |       | Result            | Result            | ----  | ----  | ----  |
| <b>ED037P: Alkalinity by PC Titrator</b>               |             |      |       |                   |                   |       |       |       |
| Hydroxide Alkalinity as CaCO3                          | DMO-210-001 | 1    | mg/L  | <1                | <1                | ----  | ----  | ----  |
| Carbonate Alkalinity as CaCO3                          | 3812-32-6   | 1    | mg/L  | <1                | <1                | ----  | ----  | ----  |
| Bicarbonate Alkalinity as CaCO3                        | 71-52-3     | 1    | mg/L  | 867               | 439               | ----  | ----  | ----  |
| Total Alkalinity as CaCO3                              | ----        | 1    | mg/L  | 867               | 439               | ----  | ----  | ----  |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b> |             |      |       |                   |                   |       |       |       |
| Sulfate as SO4 - Turbidimetric                         | 14808-79-8  | 1    | mg/L  | 54                | 574               | ----  | ----  | ----  |
| <b>ED045G: Chloride by Discrete Analyser</b>           |             |      |       |                   |                   |       |       |       |
| Chloride                                               | 16887-00-6  | 1    | mg/L  | 384               | 3570              | ----  | ----  | ----  |
| <b>ED093F: Dissolved Major Cations</b>                 |             |      |       |                   |                   |       |       |       |
| Calcium                                                | 7440-70-2   | 1    | mg/L  | 2                 | 156               | ----  | ----  | ----  |
| Magnesium                                              | 7439-95-4   | 1    | mg/L  | 4                 | 188               | ----  | ----  | ----  |
| Sodium                                                 | 7440-23-5   | 1    | mg/L  | 543               | 2140              | ----  | ----  | ----  |
| Potassium                                              | 7440-09-7   | 1    | mg/L  | 19                | 101               | ----  | ----  | ----  |
| <b>EN055: Ionic Balance</b>                            |             |      |       |                   |                   |       |       |       |
| ∅ Total Anions                                         | ----        | 0.01 | meq/L | 29.3              | 121               | ----  | ----  | ----  |
| ∅ Total Cations                                        | ----        | 0.01 | meq/L | 24.5              | 119               | ----  | ----  | ----  |
| ∅ Ionic Balance                                        | ----        | 0.01 | %     | 8.82              | 1.04              | ----  | ----  | ----  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>           |             |      |       |                   |                   |       |       |       |
| Perfluorobutane sulfonic acid (PFBS)                   | 375-73-5    | 0.02 | µg/L  | <0.02             | 0.73              | ----  | ----  | ----  |
| Perfluoropentane sulfonic acid (PFPeS)                 | 2706-91-4   | 0.02 | µg/L  | <0.02             | 0.78              | ----  | ----  | ----  |
| Perfluorohexane sulfonic acid (PFHxS)                  | 355-46-4    | 0.01 | µg/L  | <0.01             | 6.70              | ----  | ----  | ----  |
| Perfluoroheptane sulfonic acid (PFHpS)                 | 375-92-8    | 0.02 | µg/L  | <0.02             | 0.39              | ----  | ----  | ----  |
| Perfluorooctane sulfonic acid (PFOS)                   | 1763-23-1   | 0.01 | µg/L  | 0.01              | 3.57              | ----  | ----  | ----  |
| Perfluorodecane sulfonic acid (PFDS)                   | 335-77-3    | 0.02 | µg/L  | <0.02             | <0.02             | ----  | ----  | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>         |             |      |       |                   |                   |       |       |       |
| 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             | 0.40              | ----  | ----  | ----  |
| Perfluorohexanoic acid (PFHxA)                         | 307-24-4    | 0.02 | µg/L  | <0.02             | 2.35              | ----  | ----  | ----  |
| Perfluoroheptanoic acid (PFHpA)                        | 375-85-9    | 0.02 | µg/L  | <0.02             | 0.21              | ----  | ----  | ----  |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_MW165_211124 | 0960_MW163_211124 | ----  | ----  | ----  |
|------------------------------------------------------------|-------------|------|------|-------------------|-------------------|-------|-------|-------|
| Sampling date / time                                       |             |      |      | 24-Nov-2021 14:58 | 24-Nov-2021 15:41 | ----  | ----  | ----  |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2114395-011     | EP2114395-012     | ----- | ----- | ----- |
|                                                            |             |      |      | Result            | Result            | ----  | ----  | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                   |                   |       |       |       |
| Perfluorooctanoic acid (PFOA)                              | 335-67-1    | 0.01 | µg/L | <0.01             | <b>0.32</b>       | ----  | ----  | ----  |
| 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             | ----  | ----  | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                   |                   |       |       |       |
| 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             | ----  | ----  | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                   |                   |       |       |       |
| 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             | <b>0.14</b>       | ----  | ----  | ----  |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                  | 39108-34-4  | 0.05 | µg/L | <0.05             | <0.05             | ----  | ----  | ----  |



## Analytical Results

|                                                        |                    |      |      |           |                   |                   |       |       |       |
|--------------------------------------------------------|--------------------|------|------|-----------|-------------------|-------------------|-------|-------|-------|
| Sub-Matrix: GROUNDWATER<br>(Matrix: WATER)             |                    |      |      | Sample ID | 0960_MW165_211124 | 0960_MW163_211124 | ----  | ----  | ----  |
| Sampling date / time                                   |                    |      |      |           | 24-Nov-2021 14:58 | 24-Nov-2021 15:41 | ----  | ----  | ----  |
| Compound                                               | CAS Number         | LOR  | Unit |           | EP2114395-011     | EP2114395-012     | ----- | ----- | ----- |
|                                                        |                    |      |      | Result    | Result            |                   | ----  | ----  | ----  |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued |                    |      |      |           |                   |                   |       |       |       |
| 10:2 Fluorotelomer sulfonic acid<br>(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              | 15.7              | ----  | ----  | ----  |
| Sum of PFHxS and PFOS                                  | 355-46-4/1763-23-1 | 0.01 | µg/L |           | 0.01              | 10.3              | ----  | ----  | ----  |
| Sum of PFAS (WA DER List)                              | ----               | 0.01 | µg/L |           | 0.01              | 14.5              | ----  | ----  | ----  |
| EP231S: PFAS Surrogate                                 |                    |      |      |           |                   |                   |       |       |       |
| 13C4-PFOS                                              | ----               | 0.02 | %    |           | 109               | 108               | ----  | ----  | ----  |
| 13C8-PFOA                                              | ----               | 0.02 | %    |           | 108               | 105               | ----  | ----  | ----  |



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Work Order : EP2114395  
Client : CARDNO (WA) PTY LTD  
Project : WA\_0960\_PFASOMP



## Surrogate Control Limits

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

## Inter-Laboratory Testing

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

|                                |                                                                          |                                |                                                  |
|--------------------------------|--------------------------------------------------------------------------|--------------------------------|--------------------------------------------------|
| <b>Work Order</b>              | <b>: EP2114395</b>                                                       | <b>Page</b>                    | <b>: 1 of 6</b>                                  |
| <b>Client</b>                  | <b>: CARDNO (WA) PTY LTD</b>                                             | <b>Laboratory</b>              | <b>: Environmental Division Perth</b>            |
| <b>Contact</b>                 | <b>: [REDACTED]</b>                                                      | <b>Contact</b>                 | <b>: [REDACTED]</b>                              |
| <b>Address</b>                 | <b>: 11 HARVEST TERRACE PO BOX 155<br/>WEST PERTH WA, AUSTRALIA 6006</b> | <b>Address</b>                 | <b>: 26 Rigali Way Wangara WA Australia 6065</b> |
| <b>Telephone</b>               | <b>: ----</b>                                                            | <b>Telephone</b>               | <b>: +61-8-9406 1301</b>                         |
| <b>Project</b>                 | <b>: WA_0960_PFASOMP</b>                                                 | <b>Date Samples Received</b>   | <b>: 26-Nov-2021</b>                             |
| <b>Order number</b>            | <b>: DEF19009/0960</b>                                                   | <b>Date Analysis Commenced</b> | <b>: 01-Dec-2021</b>                             |
| <b>C-O-C number</b>            | <b>: 30626</b>                                                           | <b>Issue Date</b>              | <b>: 07-Dec-2021</b>                             |
| <b>Sampler</b>                 | <b>: [REDACTED]</b>                                                      |                                |                                                  |
| <b>Site</b>                    | <b>: DEF19009/Learmonth</b>                                              |                                |                                                  |
| <b>Quote number</b>            | <b>: SY/139/19</b>                                                       |                                |                                                  |
| <b>No. of samples received</b> | <b>: 12</b>                                                              |                                |                                                  |
| <b>No. of samples analysed</b> | <b>: 12</b>                                                              |                                |                                                  |



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]         | Laboratory Manager (Perth) | Perth Inorganics, Wangara, WA    |
| [REDACTED]         | LCMS Coordinator           | Sydney Organics, Smithfield, NSW |



## 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**

| Sub-Matrix: WATER                                                 |                   |                                          |             | Laboratory Duplicate (DUP) Report |      |                 |                  |         |                    |
|-------------------------------------------------------------------|-------------------|------------------------------------------|-------------|-----------------------------------|------|-----------------|------------------|---------|--------------------|
| Laboratory sample ID                                              | Sample ID         | Method: Compound                         | CAS Number  | LOR                               | Unit | Original Result | Duplicate Result | RPD (%) | Acceptable RPD (%) |
| ED037P: Alkalinity by PC Titrator (QC Lot: 4055129)               |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2114392-002                                                     | Anonymous         | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 385             | 386              | 0.3     | 0% - 20%           |
|                                                                   |                   | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 385             | 386              | 0.3     | 0% - 20%           |
| EP2114392-012                                                     | Anonymous         | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | 4               | 4                | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 121             | 121              | 0.0     | 0% - 20%           |
|                                                                   |                   | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 125             | 125              | 0.0     | 0% - 20%           |
| ED037P: Alkalinity by PC Titrator (QC Lot: 4055130)               |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2114395-006                                                     | 0960_MW113_211124 | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 386             | 383              | 0.7     | 0% - 20%           |
|                                                                   |                   | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 386             | 383              | 0.7     | 0% - 20%           |
| EP2114414-002                                                     | Anonymous         | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | 5               | 4                | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 154             | 156              | 1.3     | 0% - 20%           |
|                                                                   |                   | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 159             | 161              | 1.2     | 0% - 20%           |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4040540) |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2114394-001                                                     | Anonymous         | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 5390            | 5290             | 1.9     | 0% - 20%           |
| EP2114395-006                                                     | 0960_MW113_211124 | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 272             | 273              | 0.0     | 0% - 20%           |
| ED045G: Chloride by Discrete Analyser (QC Lot: 4040539)           |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2114394-001                                                     | Anonymous         | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 36400           | 35700            | 1.8     | 0% - 20%           |
| EP2114395-006                                                     | 0960_MW113_211124 | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 3070            | 3150             | 2.4     | 0% - 20%           |



| Sub-Matrix: WATER                                 |                   |                   |            | Laboratory Duplicate (DUP) Report |      |                 |                  |         |                    |
|---------------------------------------------------|-------------------|-------------------|------------|-----------------------------------|------|-----------------|------------------|---------|--------------------|
| Laboratory sample ID                              | Sample ID         | Method: Compound  | CAS Number | LOR                               | Unit | Original Result | Duplicate Result | RPD (%) | Acceptable RPD (%) |
| ED093F: Dissolved Major Cations (QC Lot: 4042970) |                   |                   |            |                                   |      |                 |                  |         |                    |
| EP2114394-001                                     | Anonymous         | ED093F: Calcium   | 7440-70-2  | 1                                 | mg/L | 1080            | 1090             | 0.6     | 0% - 20%           |
|                                                   |                   | ED093F: Magnesium | 7439-95-4  | 1                                 | mg/L | 2780            | 2810             | 1.2     | 0% - 20%           |
|                                                   |                   | ED093F: Sodium    | 7440-23-5  | 1                                 | mg/L | 23000           | 23300            | 1.7     | 0% - 20%           |
|                                                   |                   | ED093F: Potassium | 7440-09-7  | 1                                 | mg/L | 1180            | 1200             | 1.4     | 0% - 20%           |
| EP2114395-006                                     | 0960_MW113_211124 | ED093F: Calcium   | 7440-70-2  | 1                                 | mg/L | 210             | 209              | 0.0     | 0% - 20%           |
|                                                   |                   | ED093F: Magnesium | 7439-95-4  | 1                                 | mg/L | 178             | 177              | 0.0     | 0% - 20%           |
|                                                   |                   | ED093F: Sodium    | 7440-23-5  | 1                                 | mg/L | 1710            | 1700             | 0.4     | 0% - 20%           |
|                                                   |                   | ED093F: Potassium | 7440-09-7  | 1                                 | mg/L | 66              | 65               | 0.0     | 0% - 20%           |





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

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

Sub-Matrix: **WATER**

| Sub-Matrix: WATER                                                |                 |      |      | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |      |
|------------------------------------------------------------------|-----------------|------|------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|------|
|                                                                  |                 |      |      |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |      |
| Method: Compound                                                 | CAS Number      | LOR  | Unit | Result                      |                                       |                           |                                   |      |
| ED037P: Alkalinity by PC Titrator (QCLot: 4055129)               |                 |      |      |                             |                                       |                           |                                   |      |
| ED037-P: Hydroxide Alkalinity as CaCO3                           | DMO-210-00<br>1 | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Carbonate Alkalinity as CaCO3                           | 3812-32-6       | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Bicarbonate Alkalinity as CaCO3                         | 71-52-3         | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Total Alkalinity as CaCO3                               | ----            | 1    | mg/L | <1                          | 20 mg/L                               | 107                       | 81.2                              | 126  |
|                                                                  |                 |      |      | <1                          | 200 mg/L                              | 101                       | 90.0                              | 110  |
| ED037P: Alkalinity by PC Titrator (QCLot: 4055130)               |                 |      |      |                             |                                       |                           |                                   |      |
| ED037-P: Hydroxide Alkalinity as CaCO3                           | DMO-210-00<br>1 | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Carbonate Alkalinity as CaCO3                           | 3812-32-6       | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Bicarbonate Alkalinity as CaCO3                         | 71-52-3         | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Total Alkalinity as CaCO3                               | ----            | 1    | mg/L | <1                          | 20 mg/L                               | 102                       | 81.2                              | 126  |
|                                                                  |                 |      |      | <1                          | 200 mg/L                              | 101                       | 90.0                              | 110  |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4040540) |                 |      |      |                             |                                       |                           |                                   |      |
| ED041G: Sulfate as SO4 - Turbidimetric                           | 14808-79-8      | 1    | mg/L | <1                          | 25 mg/L                               | 102                       | 87.7                              | 113  |
|                                                                  |                 |      |      | <1                          | 500 mg/L                              | 104                       | 87.7                              | 113  |
| ED045G: Chloride by Discrete Analyser (QCLot: 4040539)           |                 |      |      |                             |                                       |                           |                                   |      |
| ED045G: Chloride                                                 | 16887-00-6      | 1    | mg/L | <1                          | 10 mg/L                               | 98.7                      | 87.9                              | 114  |
|                                                                  |                 |      |      | <1                          | 1000 mg/L                             | 102                       | 87.9                              | 114  |
| ED093F: Dissolved Major Cations (QCLot: 4042970)                 |                 |      |      |                             |                                       |                           |                                   |      |
| ED093F: Calcium                                                  | 7440-70-2       | 1    | mg/L | <1                          | 50 mg/L                               | 98.3                      | 85.9                              | 113  |
| ED093F: Magnesium                                                | 7439-95-4       | 1    | mg/L | <1                          | 50 mg/L                               | 97.8                      | 88.0                              | 110  |
| ED093F: Sodium                                                   | 7440-23-5       | 1    | mg/L | <1                          | 50 mg/L                               | 104                       | 87.3                              | 118  |
| ED093F: Potassium                                                | 7440-09-7       | 1    | mg/L | <1                          | 50 mg/L                               | 91.9                      | 89.7                              | 108  |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4053416)           |                 |      |      |                             |                                       |                           |                                   |      |
| EP231X: Perfluorobutane sulfonic acid (PFBS)                     | 375-73-5        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 116                       | 72.0                              | 130  |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)                   | 2706-91-4       | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 122                       | 71.0                              | 127  |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)                    | 355-46-4        | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 123                       | 68.0                              | 131  |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)                   | 375-92-8        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 116                       | 69.0                              | 134  |
| EP231X: Perfluorooctane sulfonic acid (PFOS)                     | 1763-23-1       | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 123                       | 65.0                              | 140  |
| EP231X: Perfluorodecane sulfonic acid (PFDS)                     | 335-77-3        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 121                       | 53.0                              | 142  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4053416)         |                 |      |      |                             |                                       |                           |                                   |      |
| EP231X: Perfluorobutanoic acid (PFBA)                            | 375-22-4        | 0.1  | µg/L | <0.1                        | 1.25 µg/L                             | 128                       | 73.0                              | 129  |
| EP231X: Perfluoropentanoic acid (PFPeA)                          | 2706-90-3       | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 126                       | 72.0                              | 129  |

### Method Blank (MB) Report

### Spike

**Spike Recovery (%)**

**Acceptable Limits (%)**

CAS Number

**LOR**

Unit

## Result

### Concentration

**LCS**

Low

**High**

|                                              |            |      |      |       |            |     |      |     |
|----------------------------------------------|------------|------|------|-------|------------|-----|------|-----|
| EP231X: Perfluorohexanoic acid (PFHxA)       | 307-24-4   | 0.02 | µg/L | <0.02 | 0.25 µg/L  | 129 | 72.0 | 129 |
| EP231X: Perfluoroheptanoic acid (PFHpA)      | 375-85-9   | 0.02 | µg/L | <0.02 | 0.25 µg/L  | 129 | 72.0 | 130 |
| EP231X: Perfluorooctanoic acid (PFOA)        | 335-67-1   | 0.01 | µg/L | <0.01 | 0.25 µg/L  | 132 | 71.0 | 133 |
| EP231X: Perfluorononanoic acid (PFNA)        | 375-95-1   | 0.02 | µg/L | <0.02 | 0.25 µg/L  | 118 | 69.0 | 130 |
| EP231X: Perfluorodecanoic acid (PFDA)        | 335-76-2   | 0.02 | µg/L | <0.02 | 0.25 µg/L  | 123 | 71.0 | 129 |
| EP231X: Perfluoroundecanoic acid (PFUnDA)    | 2058-94-8  | 0.02 | µg/L | <0.02 | 0.25 µg/L  | 120 | 69.0 | 133 |
| EP231X: Perfluorododecanoic acid (PFDoDA)    | 307-55-1   | 0.02 | µg/L | <0.02 | 0.25 µg/L  | 129 | 72.0 | 134 |
| EP231X: Perfluorotridecanoic acid (PFTTrDA)  | 72629-94-8 | 0.02 | µg/L | <0.02 | 0.25 µg/L  | 126 | 65.0 | 144 |
| EP231X: Perfluorotetradecanoic acid (PFTeDA) | 376-06-7   | 0.05 | µg/L | <0.05 | 0.625 µg/L | 122 | 71.0 | 132 |

|                                                                   |            |      |      |       |            |     |      |     |
|-------------------------------------------------------------------|------------|------|------|-------|------------|-----|------|-----|
| EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6   | 0.02 | µg/L | <0.02 | 0.25 µg/L  | 133 | 67.0 | 137 |
| EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8 | 0.05 | µg/L | <0.05 | 0.625 µg/L | 117 | 68.0 | 141 |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2  | 0.05 | µg/L | <0.05 | 0.625 µg/L | 123 | 62.6 | 147 |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7 | 0.05 | µg/L | <0.05 | 0.625 µg/L | 121 | 66.0 | 145 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2  | 0.05 | µg/L | <0.05 | 0.625 µg/L | 121 | 57.6 | 145 |
| 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  | 123 | 61.0 | 135 |

|                                                     |             |      |      |       |           |      |      |     |
|-----------------------------------------------------|-------------|------|------|-------|-----------|------|------|-----|
| EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)   | 757124-72-4 | 0.05 | µg/L | <0.05 | 0.25 µg/L | 134  | 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 | 127  | 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 | 132  | 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 | 92.2 | 71.4 | 144 |

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.

### Matrix Spike (MS) Report

### Spike

SpikeRecovery(%)

### Acceptable Limits (%)

Laboratory sample ID

Sample ID

**Method:** Compound

CAS Number

### Concentration

MS

Low

*High*

|               |           |                                        |            |          |                  |      |     |
|---------------|-----------|----------------------------------------|------------|----------|------------------|------|-----|
| EP2114394-001 | Anonymous | ED041G: Sulfate as SO4 - Turbidimetric | 14808-79-8 | 100 mg/L | # Not Determined | 70.0 | 130 |
|---------------|-----------|----------------------------------------|------------|----------|------------------|------|-----|



Sub-Matrix: WATER

|                                                                    |  |           |                  | Matrix Spike (MS) Report |                     |                     |                                |
|--------------------------------------------------------------------|--|-----------|------------------|--------------------------|---------------------|---------------------|--------------------------------|
| Laboratory sample ID                                               |  | Sample ID | Method: Compound | CAS Number               | Spike Concentration | SpikeRecovery(%) MS | Acceptable Limits (%) Low High |
| ED045G: Chloride by Discrete Analyser (QCLot: 4040539) - continued |  |           |                  |                          |                     |                     |                                |
| EP2114394-001                                                      |  | Anonymous | ED045G: Chloride | 16887-00-6               | 1000 mg/L           | # Not Determined    | 70.0 130                       |

## QA/QC Compliance Assessment to assist with Quality Review

|              |                       |                         |                                |
|--------------|-----------------------|-------------------------|--------------------------------|
| Work Order   | : EP2114395           | Page                    | : 1 of 6                       |
| Client       | : CARDNO (WA) PTY LTD | Laboratory              | : Environmental Division Perth |
| Contact      | : [REDACTED]          | Telephone               | : +61-8-9406 1301              |
| Project      | : WA_0960_PFASOMP     | Date Samples Received   | : 26-Nov-2021                  |
| Site         | : DEF19009/Learmonth  | Issue Date              | : 07-Dec-2021                  |
| Sampler      | : [REDACTED]          | No. of samples received | : 12                           |
| Order number | : DEF19009/0960       | No. of samples analysed | : 12                           |

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

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

### Summary of Outliers

#### Outliers : Quality Control Samples

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

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- 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.

Page : 2 of 6  
 Work Order : EP2114395  
 Client : CARDNO (WA) PTY LTD  
 Project : WA\_0960\_PFASOMP



### 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                                                                                      |
|-------------------------------------------------|----------------------|------------------|---------------------------------------|------------|----------------|--------|----------------------------------------------------------------------------------------------|
| <b>Matrix Spike (MS) Recoveries</b>             |                      |                  |                                       |            |                |        |                                                                                              |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA | EP2114394--001       | Anonymous        | <b>Sulfate as SO4 - Turbidimetric</b> | 14808-79-8 | Not Determined | ----   | <b>MS recovery not determined, background level greater than or equal to 4x spike level.</b> |
| ED045G: Chloride by Discrete Analyser           | EP2114394--001       | Anonymous        | <b>Chloride</b>                       | 16887-00-6 | Not Determined | ----   | <b>MS recovery not determined, background level greater than or equal to 4x spike level.</b> |

### Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

| Quality Control Sample Type                          | Count |         | Rate (%) |          | Quality Control Specification  |
|------------------------------------------------------|-------|---------|----------|----------|--------------------------------|
| Method                                               | QC    | Regular | Actual   | Expected |                                |
| <b>Laboratory Duplicates (DUP)</b>                   |       |         |          |          |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | 0     | 20      | 0.00     | 10.00    | NEPM 2013 B3 & ALS QC Standard |
| <b>Matrix Spikes (MS)</b>                            |       |         |          |          |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | 0     | 20      | 0.00     | 5.00     | NEPM 2013 B3 & ALS QC Standard |

## Analysis Holding Time Compliance

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

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

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

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

Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                   | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |             |   |
|------------------------------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|-------------|---|
| Container / Client Sample ID(s)          |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation  |   |
| ED037P: Alkalinity by PC Titrator        |             |                          |                    |            |               |                  |             |   |
| Clear Plastic Bottle - Natural (ED037-P) |             | 24-Nov-2021              | ----               | ----       | ----          | 04-Dec-2021      | 08-Dec-2021 | ✔ |
| 0960_MW021_211124, 0960_MW114_211124,    |             |                          |                    |            |               |                  |             |   |
| 0960_MW233_211124, 0960_MW162_211124,    |             |                          |                    |            |               |                  |             |   |
| 0960_MW113_211124, 0960_MW168_211124,    |             |                          |                    |            |               |                  |             |   |
| 0960_MW167_211124, 0960_MW166_211124,    |             |                          |                    |            |               |                  |             |   |
| 0960_MW165_211124, 0960_MW163_211124     |             |                          |                    |            |               |                  |             |   |





Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                          |                    | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |
|-------------------------------------------------|--------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|
| Container / Client Sample ID(s)                 |                    |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA |                    |             |                          |                    |            |               |                  |            |
| Clear Plastic Bottle - Natural (ED041G)         |                    | 24-Nov-2021 | ----                     | ----               | ----       | 02-Dec-2021   | 22-Dec-2021      | ✔          |
| 0960_MW021_211124,                              | 0960_MW114_211124, |             |                          |                    |            |               |                  |            |
| 0960_MW233_211124,                              | 0960_MW162_211124, |             |                          |                    |            |               |                  |            |
| 0960_MW113_211124,                              | 0960_MW168_211124, |             |                          |                    |            |               |                  |            |
| 0960_MW167_211124,                              | 0960_MW166_211124, |             |                          |                    |            |               |                  |            |
| 0960_MW165_211124,                              | 0960_MW163_211124  |             |                          |                    |            |               |                  |            |
| ED045G: Chloride by Discrete Analyser           |                    |             |                          |                    |            |               |                  |            |
| Clear Plastic Bottle - Natural (ED045G)         |                    | 24-Nov-2021 | ----                     | ----               | ----       | 02-Dec-2021   | 22-Dec-2021      | ✔          |
| 0960_MW021_211124,                              | 0960_MW114_211124, |             |                          |                    |            |               |                  |            |
| 0960_MW233_211124,                              | 0960_MW162_211124, |             |                          |                    |            |               |                  |            |
| 0960_MW113_211124,                              | 0960_MW168_211124, |             |                          |                    |            |               |                  |            |
| 0960_MW167_211124,                              | 0960_MW166_211124, |             |                          |                    |            |               |                  |            |
| 0960_MW165_211124,                              | 0960_MW163_211124  |             |                          |                    |            |               |                  |            |
| ED093F: Dissolved Major Cations                 |                    |             |                          |                    |            |               |                  |            |
| Clear Plastic Bottle - Natural (ED093F)         |                    | 24-Nov-2021 | ----                     | ----               | ----       | 01-Dec-2021   | 01-Dec-2021      | ✔          |
| 0960_MW021_211124,                              | 0960_MW114_211124, |             |                          |                    |            |               |                  |            |
| 0960_MW233_211124,                              | 0960_MW162_211124, |             |                          |                    |            |               |                  |            |
| 0960_MW113_211124,                              | 0960_MW168_211124, |             |                          |                    |            |               |                  |            |
| 0960_MW167_211124,                              | 0960_MW166_211124, |             |                          |                    |            |               |                  |            |
| 0960_MW165_211124,                              | 0960_MW163_211124  |             |                          |                    |            |               |                  |            |
| EP231A: Perfluoroalkyl Sulfonic Acids           |                    |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                         |                    | 24-Nov-2021 | 03-Dec-2021              | 23-May-2022        | ✔          | 06-Dec-2021   | 23-May-2022      | ✔          |
| 0960_MW021_211124,                              | 0960_MW114_211124, |             |                          |                    |            |               |                  |            |
| 0960_MW233_211124,                              | 0960_QC124_211124, |             |                          |                    |            |               |                  |            |
| 0960_MW162_211124,                              | 0960_MW113_211124, |             |                          |                    |            |               |                  |            |
| 0960_QC127_211124,                              | 0960_MW168_211124, |             |                          |                    |            |               |                  |            |
| 0960_MW167_211124,                              | 0960_MW166_211124, |             |                          |                    |            |               |                  |            |
| 0960_MW165_211124,                              | 0960_MW163_211124  |             |                          |                    |            |               |                  |            |
| EP231B: Perfluoroalkyl Carboxylic Acids         |                    |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                         |                    | 24-Nov-2021 | 03-Dec-2021              | 23-May-2022        | ✔          | 06-Dec-2021   | 23-May-2022      | ✔          |
| 0960_MW021_211124,                              | 0960_MW114_211124, |             |                          |                    |            |               |                  |            |
| 0960_MW233_211124,                              | 0960_QC124_211124, |             |                          |                    |            |               |                  |            |
| 0960_MW162_211124,                              | 0960_MW113_211124, |             |                          |                    |            |               |                  |            |
| 0960_QC127_211124,                              | 0960_MW168_211124, |             |                          |                    |            |               |                  |            |
| 0960_MW167_211124,                              | 0960_MW166_211124, |             |                          |                    |            |               |                  |            |
| 0960_MW165_211124,                              | 0960_MW163_211124  |             |                          |                    |            |               |                  |            |



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                     |                    | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |
|--------------------------------------------|--------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|
| Container / Client Sample ID(s)            |                    |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| EP231C: Perfluoroalkyl Sulfonamides        |                    |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                    |                    | 24-Nov-2021 | 03-Dec-2021              | 23-May-2022        | ✓          | 06-Dec-2021   | 23-May-2022      | ✓          |
| 0960_MW021_211124,                         | 0960_MW114_211124, |             |                          |                    |            |               |                  |            |
| 0960_MW233_211124,                         | 0960_QC124_211124, |             |                          |                    |            |               |                  |            |
| 0960_MW162_211124,                         | 0960_MW113_211124, |             |                          |                    |            |               |                  |            |
| 0960_QC127_211124,                         | 0960_MW168_211124, |             |                          |                    |            |               |                  |            |
| 0960_MW167_211124,                         | 0960_MW166_211124, |             |                          |                    |            |               |                  |            |
| 0960_MW165_211124,                         | 0960_MW163_211124  |             |                          |                    |            |               |                  |            |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids |                    |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                    |                    | 24-Nov-2021 | 03-Dec-2021              | 23-May-2022        | ✓          | 06-Dec-2021   | 23-May-2022      | ✓          |
| 0960_MW021_211124,                         | 0960_MW114_211124, |             |                          |                    |            |               |                  |            |
| 0960_MW233_211124,                         | 0960_QC124_211124, |             |                          |                    |            |               |                  |            |
| 0960_MW162_211124,                         | 0960_MW113_211124, |             |                          |                    |            |               |                  |            |
| 0960_QC127_211124,                         | 0960_MW168_211124, |             |                          |                    |            |               |                  |            |
| 0960_MW167_211124,                         | 0960_MW166_211124, |             |                          |                    |            |               |                  |            |
| 0960_MW165_211124,                         | 0960_MW163_211124  |             |                          |                    |            |               |                  |            |
| EP231P: PFAS Sums                          |                    |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                    |                    | 24-Nov-2021 | 03-Dec-2021              | 23-May-2022        | ✓          | 06-Dec-2021   | 23-May-2022      | ✓          |
| 0960_MW021_211124,                         | 0960_MW114_211124, |             |                          |                    |            |               |                  |            |
| 0960_MW233_211124,                         | 0960_QC124_211124, |             |                          |                    |            |               |                  |            |
| 0960_MW162_211124,                         | 0960_MW113_211124, |             |                          |                    |            |               |                  |            |
| 0960_QC127_211124,                         | 0960_MW168_211124, |             |                          |                    |            |               |                  |            |
| 0960_MW167_211124,                         | 0960_MW166_211124, |             |                          |                    |            |               |                  |            |
| 0960_MW165_211124,                         | 0960_MW163_211124  |             |                          |                    |            |               |                  |            |



## Quality Control Parameter Frequency Compliance

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

Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

| Quality Control Sample Type                            |         | Count |         | Rate (%) |          | Quality Control Specification |                                |
|--------------------------------------------------------|---------|-------|---------|----------|----------|-------------------------------|--------------------------------|
| Analytical Methods                                     | Method  | QC    | Regular | Actual   | Expected |                               | Evaluation                     |
|                                                        |         |       |         |          |          |                               |                                |
| Laboratory Duplicates (DUP)                            |         |       |         |          |          |                               |                                |
| Alkalinity by PC Titrator                              | ED037-P | 4     | 40      | 10.00    | 10.00    | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 2     | 20      | 10.00    | 10.00    | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 2     | 20      | 10.00    | 10.00    | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 0     | 20      | 0.00     | 10.00    | ✗                             | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 2     | 20      | 10.00    | 10.00    | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Laboratory Control Samples (LCS)                       |         |       |         |          |          |                               |                                |
| Alkalinity by PC Titrator                              | ED037-P | 4     | 40      | 10.00    | 10.00    | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 2     | 20      | 10.00    | 10.00    | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 1     | 20      | 5.00     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 20      | 5.00     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 2     | 20      | 10.00    | 10.00    | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Method Blanks (MB)                                     |         |       |         |          |          |                               |                                |
| Alkalinity by PC Titrator                              | ED037-P | 2     | 40      | 5.00     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 1     | 20      | 5.00     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 1     | 20      | 5.00     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 20      | 5.00     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 1     | 20      | 5.00     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Matrix Spikes (MS)                                     |         |       |         |          |          |                               |                                |
| Chloride by Discrete Analyser                          | ED045G  | 1     | 20      | 5.00     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 0     | 20      | 0.00     | 5.00     | ✗                             | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 1     | 20      | 5.00     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |



## Brief Method Summaries

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

| Analytical Methods                                                 | Method       | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------------------|--------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alkalinity by PC Titrator                                          | ED037-P      | WATER  | In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                                                                                                                                                                                                                |
| Sulfate (Turbidimetric) as SO <sub>4</sub> 2- by Discrete Analyser | ED041G       | WATER  | In house: Referenced to APHA 4500-SO <sub>4</sub> . Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO <sub>4</sub> suspension is measured by a photometer and the SO <sub>4</sub> -2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                         |
| Chloride by Discrete Analyser                                      | ED045G       | WATER  | In house: Referenced to APHA 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA seal method 2 017-1-L                                                                                                                                                                                                                                                                                                                                      |
| Major Cations - Dissolved                                          | ED093F       | WATER  | In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                           |
| Ionic Balance by PCT DA and Turbi SO <sub>4</sub> DA               | * EN055 - PG | WATER  | In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS               | EP231X       | WATER  | In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements. |
| Preparation Methods                                                | Method       | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Solid Phase Extraction (SPE) for PFAS in water                     | ORG72        | WATER  | In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.                                                                                                                                                                                                |



# CHAIN OF CUSTODY

COC#: 30627

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: CG - DEF19009/Learmonth SED

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:

/ ES2019CARBSD0002

## LABORATORY USE ONLY (Circle)

Custody Seal intact?

Yes 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 | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|-------------------|-------------|------------------------|--------|----------------------|---------|--------------------|----------------------|------------------------|
| 001    | 0960_SS227_211124 |             | 24/11/2021<br>11:21 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 002    | 0960_QC121_211124 |             | 24/11/2021<br>11:21 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 003    | 0960_SS291_211124 |             | 24/11/2021<br>11:37 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 004    | 0960_SS293_211124 |             | 24/11/2021<br>11:55 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 005    | 0960_SS198_211124 |             | 24/11/2021<br>12:05 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 006    | 0960_QC125_211124 |             | 24/11/2021<br>12:05 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 007    | 0960_SD210_211124 |             | 24/11/2021<br>12:12 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 008    | 0060_SD209_211124 |             | 24/11/2021<br>02:59 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 009    | 0960_SD302_211124 |             | 24/11/2021<br>03:26 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |





# CHAIN OF CUSTODY

COC#: 30627

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: CG - DEF19009/Learmonth SED

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:

/ ES2019CARBSD0002

## LABORATORY USE ONLY (Circle)

Custody Seal intact?

Yes 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 | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|-------------------|-------------|------------------------|--------|----------------------|---------|--------------------|----------------------|------------------------|
| 010    | 0960_SD303_211124 |             | 24/11/2021<br>03:41 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |

11 SS242  
12 SD207  
13 QC225

**CHAIN OF CUSTODY**

COC#: 30627

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: CG - DEF19009/Learmonth SED

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:

/ ES2019CARBSD0002

**LABORATORY USE ONLY (Circle)**

Custody Seal intact?

Yes 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    | 0960_SS227_211124 | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 002    | 0960_QC121_211124 | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 003    | 0960_SS291_211124 | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 004    | 0960_SS293_211124 | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 005    | 0960_SS198_211124 | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 006    | 0960_QC125_211124 | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 007    | 0960_SD210_211124 | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 008    | 0060_SD209_211124 | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 009    | 0960_SD302_211124 | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 010    | 0960_SD303_211124 | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |

**CHAIN OF CUSTODY**

COC#: 30627

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: CG - DEF19009/Learmonth SED

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:

/ ES2019CARBSD0002

**LABORATORY USE ONLY (Circle)**

Custody Seal intact?

Yes 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    | 0960_SS227_211124 | HDPE Soil Jar | 200 mL | 00620719069309 | Grey | No       |        |
| 002    | 0960_QC121_211124 | HDPE Soil Jar | 200 mL | 00621019097714 | Grey | No       |        |
| 003    | 0960_SS291_211124 | HDPE Soil Jar | 200 mL | 00621019097769 | Grey | No       |        |
| 004    | 0960_SS293_211124 | HDPE Soil Jar | 200 mL | 00621019097694 | Grey | No       |        |
| 005    | 0960_SS198_211124 | HDPE Soil Jar | 200 mL | 00621019097708 | Grey | No       |        |
| 006    | 0960_QC125_211124 | HDPE Soil Jar | 200 mL | 00621019097672 | Grey | No       |        |
| 007    | 0960_SD210_211124 | HDPE Soil Jar | 200 mL | 00621019097729 | Grey | No       |        |
| 008    | 0060_SD209_211124 | HDPE Soil Jar | 200 mL | 00621019097765 | Grey | No       |        |
| 009    | 0960_SD302_211124 | HDPE Soil Jar | 200 mL | 00621019097690 | Grey | No       |        |
| 010    | 0960_SD303_211124 | HDPE Soil Jar | 200 mL | 00621019097770 | Grey | No       |        |

**Total Bottle Count: ALS: 10, Non ALS: 0**

## SAMPLE RECEIPT NOTIFICATION (SRN)

**Work Order : EP2114396**

|                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Client : <b>CARDNO (WA) PTY LTD</b></p> <p>Contact : [REDACTED]</p> <p>Address : 11 HARVEST TERRACE PO BOX 155<br/>WEST PERTH WA, AUSTRALIA 6006</p> <p>E-mail : [REDACTED]@cardno.com.au</p> <p>Telephone : ----</p> <p>Facsimile : ----</p> <p>Project : WA_0960_PFASOMP</p> <p>Order number : DEF19009/0960</p> <p>C-O-C number : 30627</p> <p>Site : DEF19009/Learmonth</p> <p>Sampler : [REDACTED]</p> | <p>Laboratory : Environmental Division Perth</p> <p>Contact : Customer Services EP</p> <p>Address : 26 Rigali Way Wangara WA Australia<br/>6065</p> <p>E-mail : ALSEnviro.Perth@alsglobal.com</p> <p>Telephone : +61-8-9406 1301</p> <p>Facsimile : +61-8-9406 1399</p> <p>Page : 1 of 2</p> <p>Quote number : ES2019CARBSD0002 (SY/139/19)</p> <p>QC Level : NEPM 2013 B3 &amp; ALS QC Standard</p> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Dates

|                                           |                                               |
|-------------------------------------------|-----------------------------------------------|
| Date Samples Received : 26-Nov-2021 09:55 | Issue Date : 29-Nov-2021                      |
| Client Requested Due Date : 08-Dec-2021   | Scheduled Reporting Date : <b>08-Dec-2021</b> |

### Delivery Details

|                             |                                              |
|-----------------------------|----------------------------------------------|
| Mode of Delivery : Carrier  | Security Seal : Not Available                |
| No. of coolers/boxes : 3    | Temperature : 24.8 - Ice present             |
| Receipt Detail : Ice Melted | No. of samples received / analysed : 12 / 12 |

### General Comments

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



## Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exists.

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: SOIL

| Laboratory sample ID | Sampling date / time | Sample ID         | SOIL - EA055-103 Moisture Content | SOIL - EP231X (solids) PFAS - Full Suite (28 analytes) |
|----------------------|----------------------|-------------------|-----------------------------------|--------------------------------------------------------|
| EP2114396-001        | 24-Nov-2021 11:21    | 0960_SS227_211124 | ✓                                 | ✓                                                      |
| EP2114396-002        | 24-Nov-2021 11:21    | 0960_QC121_211124 | ✓                                 | ✓                                                      |
| EP2114396-003        | 24-Nov-2021 11:37    | 0960_SS291_211124 | ✓                                 | ✓                                                      |
| EP2114396-004        | 24-Nov-2021 11:55    | 0960_SS293_211124 | ✓                                 | ✓                                                      |
| EP2114396-005        | 24-Nov-2021 12:05    | 0960_SS198_211124 | ✓                                 | ✓                                                      |
| EP2114396-006        | 24-Nov-2021 12:05    | 0960_QC125_211124 | ✓                                 | ✓                                                      |
| EP2114396-007        | 24-Nov-2021 12:12    | 0960_SD210_211124 | ✓                                 | ✓                                                      |
| EP2114396-008        | 24-Nov-2021 14:59    | 0060_SD209_211124 | ✓                                 | ✓                                                      |
| EP2114396-009        | 24-Nov-2021 15:26    | 0960_SD302_211124 | ✓                                 | ✓                                                      |
| EP2114396-010        | 24-Nov-2021 15:41    | 0960_SD303_211124 | ✓                                 | ✓                                                      |
| EP2114396-011        | 24-Nov-2021 00:00    | 0960_SS292_211124 | ✓                                 | ✓                                                      |
| EP2114396-012        | 24-Nov-2021 00:00    | 0960_SD207_211124 | ✓                                 | ✓                                                      |

## Proactive Holding Time Report

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

## Requested Deliverables

|                                                                                                                  |       |                              |
|------------------------------------------------------------------------------------------------------------------|-------|------------------------------|
| <ul style="list-style-type: none"> <li>- A4 - AU Tax Invoice (INV)</li> </ul>                                    | Email | cardno.com.au                |
| <b>DERP LAB REPORTS</b>                                                                                          |       |                              |
| <ul style="list-style-type: none"> <li>- EDI Format - ESDAT (ESDAT)</li> </ul>                                   | Email | derp.labreports@esdat.com.au |
| <ul style="list-style-type: none"> <li>- *AU Certificate of Analysis - NATA (COA)</li> </ul>                     | Email | cardno.com.au                |
| <ul style="list-style-type: none"> <li>- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)</li> </ul>    | Email | cardno.com.au                |
| <ul style="list-style-type: none"> <li>- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)</li> </ul>            | Email | cardno.com.au                |
| <ul style="list-style-type: none"> <li>- A4 - AU Sample Receipt Notification - Environmental HT (SRN)</li> </ul> | Email | cardno.com.au                |
| <ul style="list-style-type: none"> <li>- Chain of Custody (CoC) (COC)</li> </ul>                                 | Email | cardno.com.au                |
| <ul style="list-style-type: none"> <li>- EDI Format - ESDAT (ESDAT)</li> </ul>                                   | Email | cardno.com.au                |
| <ul style="list-style-type: none"> <li>- EDI Format - XTab (XTAB)</li> </ul>                                     | Email | cardno.com.au                |
| <b>Perth</b>                                                                                                     |       |                              |
| <ul style="list-style-type: none"> <li>- A4 - AU Tax Invoice (INV)</li> </ul>                                    | Email | perth@cardno.com.au          |



## CERTIFICATE OF ANALYSIS

**Work Order** : **EP2114396**  
**Client** : **CARDNO (WA) PTY LTD**  
**Contact** : [REDACTED]  
**Address** : 11 HARVEST TERRACE PO BOX 155  
 WEST PERTH WA, AUSTRALIA 6006  
**Telephone** : ----  
**Project** : WA\_0960\_PFASOMP  
**Order number** : DEF19009/0960  
**C-O-C number** : 30627  
**Sampler** : [REDACTED]  
**Site** : DEF19009/Learmonth  
**Quote number** : SY/139/19  
**No. of samples received** : 12  
**No. of samples analysed** : 12

**Page** : 1 of 9  
**Laboratory** : Environmental Division Perth  
**Contact** : Customer Services EP  
**Address** : 26 Rigali Way Wangara WA Australia 6065  
**Telephone** : +61-8-9406 1301  
**Date Samples Received** : 26-Nov-2021 09:55  
**Date Analysis Commenced** : 03-Dec-2021  
**Issue Date** : 08-Dec-2021 09:57



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>      |
|------------------------------------------------------------------------|------------------|------------------------------------|
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator | Sydney Inorganics, Smithfield, NSW |
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator | Sydney Organics, Smithfield, NSW   |



## 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.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- 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

|                                                    |            |        |       | 0960_SS227_211124 | 0960_QC121_211124 | 0960_SS291_211124 | 0960_SS293_211124 | 0960_SS198_211124 |
|----------------------------------------------------|------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                               |            |        |       | 24-Nov-2021 11:21 | 24-Nov-2021 11:21 | 24-Nov-2021 11:37 | 24-Nov-2021 11:55 | 24-Nov-2021 12:05 |
| Compound                                           | CAS Number | LOR    | Unit  | EP2114396-001     | EP2114396-002     | EP2114396-003     | EP2114396-004     | EP2114396-005     |
|                                                    |            |        |       | Result            | Result            | Result            | Result            | Result            |
| <b>EA055: Moisture Content (Dried @ 105-110°C)</b> |            |        |       |                   |                   |                   |                   |                   |
| Moisture Content                                   | ----       | 0.1    | %     | 3.7               | 3.7               | 6.6               | 1.5               | 5.3               |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>       |            |        |       |                   |                   |                   |                   |                   |
| 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 | 0.0238            | 0.0199            | 0.0022            | 0.0017            | 0.0035            |
| Perfluorodecane sulfonic acid (PFDS)               | 335-77-3   | 0.0002 | mg/kg | <0.0002           | <0.0002           | <0.0002           | <0.0002           | <0.0002           |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>     |            |        |       |                   |                   |                   |                   |                   |
| 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 (PFTTrDA)                | 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           |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>         |            |        |       |                   |                   |                   |                   |                   |
| 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<br>(Matrix: SOIL)                    |                    |        |       | Sample ID | 0960_SS227_211124 | 0960_QC121_211124 | 0960_SS291_211124 | 0960_SS293_211124 | 0960_SS198_211124 |
|-----------------------------------------------------------|--------------------|--------|-------|-----------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                      |                    |        |       |           | 24-Nov-2021 11:21 | 24-Nov-2021 11:21 | 24-Nov-2021 11:37 | 24-Nov-2021 11:55 | 24-Nov-2021 12:05 |
| Compound                                                  | CAS Number         | LOR    | Unit  |           | EP2114396-001     | EP2114396-002     | EP2114396-003     | EP2114396-004     | EP2114396-005     |
|                                                           |                    |        |       | Result    | Result            | Result            | Result            | Result            | Result            |
| <b>EP231C: Perfluoroalkyl Sulfonamides - Continued</b>    |                    |        |       |           |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>         |                    |        |       |           |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231P: PFAS Sums</b>                                  |                    |        |       |           |                   |                   |                   |                   |                   |
| Sum of PFAS                                               | ----               | 0.0002 | mg/kg | 0.0238    | 0.0199            | 0.0022            | 0.0017            | 0.0035            |                   |
| Sum of PFHxS and PFOS                                     | 355-46-4/1763-23-1 | 0.0002 | mg/kg | 0.0238    | 0.0199            | 0.0022            | 0.0017            | 0.0035            |                   |
| Sum of PFAS (WA DER List)                                 | ----               | 0.0002 | mg/kg | 0.0238    | 0.0199            | 0.0022            | 0.0017            | 0.0035            |                   |
| <b>EP231S: PFAS Surrogate</b>                             |                    |        |       |           |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                 | ----               | 0.0002 | %     | 95.0      | 90.0              | 100               | 86.5              | 97.5              |                   |
| 13C8-PFOA                                                 | ----               | 0.0002 | %     | 110       | 104               | 99.5              | 108               | 120               |                   |



## Analytical Results

Sub-Matrix: SEDIMENT  
 (Matrix: SOIL)

Sample ID

|                                                    |            |        |       | 0960_QC125_211124 | 0960_SD210_211124 | 0060_SD209_211124 | 0960_SD302_211124 | 0960_SD303_211124 |
|----------------------------------------------------|------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                               |            |        |       | 24-Nov-2021 12:05 | 24-Nov-2021 12:12 | 24-Nov-2021 14:59 | 24-Nov-2021 15:26 | 24-Nov-2021 15:41 |
| Compound                                           | CAS Number | LOR    | Unit  | EP2114396-006     | EP2114396-007     | EP2114396-008     | EP2114396-009     | EP2114396-010     |
|                                                    |            |        |       | Result            | Result            | Result            | Result            | Result            |
| <b>EA055: Moisture Content (Dried @ 105-110°C)</b> |            |        |       |                   |                   |                   |                   |                   |
| Moisture Content                                   | ----       | 0.1    | %     | 6.7               | 21.2              | 25.1              | 20.8              | 22.9              |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>       |            |        |       |                   |                   |                   |                   |                   |
| 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 | 0.0029            | 0.0008            | <0.0002           | <0.0002           | 0.0003            |
| Perfluorodecane sulfonic acid (PFDS)               | 335-77-3   | 0.0002 | mg/kg | <0.0002           | <0.0002           | <0.0002           | <0.0002           | <0.0002           |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>     |            |        |       |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>         |            |        |       |                   |                   |                   |                   |                   |
| 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

|                                                           |                    |        |       | 0960_QC125_211124 | 0960_SD210_211124 | 0060_SD209_211124 | 0960_SD302_211124 | 0960_SD303_211124 |
|-----------------------------------------------------------|--------------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                      |                    |        |       | 24-Nov-2021 12:05 | 24-Nov-2021 12:12 | 24-Nov-2021 14:59 | 24-Nov-2021 15:26 | 24-Nov-2021 15:41 |
| Compound                                                  | CAS Number         | LOR    | Unit  | EP2114396-006     | EP2114396-007     | EP2114396-008     | EP2114396-009     | EP2114396-010     |
|                                                           |                    |        |       | Result            | Result            | Result            | Result            | Result            |
| <b>EP231C: Perfluoroalkyl Sulfonamides - Continued</b>    |                    |        |       |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>         |                    |        |       |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231P: PFAS Sums</b>                                  |                    |        |       |                   |                   |                   |                   |                   |
| Sum of PFAS                                               | ----               | 0.0002 | mg/kg | 0.0029            | 0.0008            | <0.0002           | <0.0002           | 0.0003            |
| Sum of PFHxS and PFOS                                     | 355-46-4/1763-23-1 | 0.0002 | mg/kg | 0.0029            | 0.0008            | <0.0002           | <0.0002           | 0.0003            |
| Sum of PFAS (WA DER List)                                 | ----               | 0.0002 | mg/kg | 0.0029            | 0.0008            | <0.0002           | <0.0002           | 0.0003            |
| <b>EP231S: PFAS Surrogate</b>                             |                    |        |       |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                 | ----               | 0.0002 | %     | 87.0              | 106               | 99.5              | 88.0              | 99.5              |
| 13C8-PFOA                                                 | ----               | 0.0002 | %     | 102               | 104               | 95.5              | 85.0              | 88.5              |



## Analytical Results

Sub-Matrix: SEDIMENT  
 (Matrix: SOIL)

Sample ID

|                                                    |            |        |       | 0960_SS292_211124 | 0960_SD207_211124 | ----  | ----  | ----  |
|----------------------------------------------------|------------|--------|-------|-------------------|-------------------|-------|-------|-------|
| Sampling date / time                               |            |        |       | 24-Nov-2021 00:00 | 24-Nov-2021 00:00 | ----  | ----  | ----  |
| Compound                                           | CAS Number | LOR    | Unit  | EP2114396-011     | EP2114396-012     | ----- | ----- | ----- |
| Result                                             |            |        |       | Result            | Result            | ----  | ----  | ----  |
| <b>EA055: Moisture Content (Dried @ 105-110°C)</b> |            |        |       |                   |                   |       |       |       |
| Moisture Content                                   | ----       | 0.1    | %     | 1.0               | 21.9              | ----  | ----  | ----  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>       |            |        |       |                   |                   |       |       |       |
| 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 | 0.0020            | <0.0002           | ----  | ----  | ----  |
| Perfluorodecane sulfonic acid (PFDS)               | 335-77-3   | 0.0002 | mg/kg | <0.0002           | <0.0002           | ----  | ----  | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>     |            |        |       |                   |                   |       |       |       |
| 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           | ----  | ----  | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>         |            |        |       |                   |                   |       |       |       |
| 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

|                                                           |                    |        |       | 0960_SS292_211124 | 0960_SD207_211124 | ----  | ----  | ----  |
|-----------------------------------------------------------|--------------------|--------|-------|-------------------|-------------------|-------|-------|-------|
| Sampling date / time                                      |                    |        |       | 24-Nov-2021 00:00 | 24-Nov-2021 00:00 | ----  | ----  | ----  |
| Compound                                                  | CAS Number         | LOR    | Unit  | EP2114396-011     | EP2114396-012     | ----- | ----- | ----- |
|                                                           |                    |        |       | Result            | Result            | ----  | ----  | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides - Continued</b>    |                    |        |       |                   |                   |       |       |       |
| 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           | ----  | ----  | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>         |                    |        |       |                   |                   |       |       |       |
| 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           | ----  | ----  | ----  |
| <b>EP231P: PFAS Sums</b>                                  |                    |        |       |                   |                   |       |       |       |
| Sum of PFAS                                               | ----               | 0.0002 | mg/kg | <b>0.0020</b>     | <0.0002           | ----  | ----  | ----  |
| Sum of PFHxS and PFOS                                     | 355-46-4/1763-23-1 | 0.0002 | mg/kg | <b>0.0020</b>     | <0.0002           | ----  | ----  | ----  |
| Sum of PFAS (WA DER List)                                 | ----               | 0.0002 | mg/kg | <b>0.0020</b>     | <0.0002           | ----  | ----  | ----  |
| <b>EP231S: PFAS Surrogate</b>                             |                    |        |       |                   |                   |       |       |       |
| 13C4-PFOS                                                 | ----               | 0.0002 | %     | <b>97.0</b>       | <b>102</b>        | ----  | ----  | ----  |
| 13C8-PFOA                                                 | ----               | 0.0002 | %     | <b>99.5</b>       | <b>91.0</b>       | ----  | ----  | ----  |



## Surrogate Control Limits

| Sub-Matrix: <b>SEDIMENT</b>   |            | Recovery Limits (%) |      |
|-------------------------------|------------|---------------------|------|
| Compound                      | CAS Number | Low                 | High |
| <b>EP231S: PFAS Surrogate</b> |            |                     |      |
| <b>13C4-PFOS</b>              | ----       | 60                  | 120  |
| <b>13C8-PFOA</b>              | ----       | 60                  | 120  |

## Inter-Laboratory Testing

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

## QUALITY CONTROL REPORT

|                                |                                                                          |                                |                                                  |
|--------------------------------|--------------------------------------------------------------------------|--------------------------------|--------------------------------------------------|
| <b>Work Order</b>              | <b>: EP2114396</b>                                                       | <b>Page</b>                    | <b>: 1 of 11</b>                                 |
| <b>Client</b>                  | <b>: CARDNO (WA) PTY LTD</b>                                             | <b>Laboratory</b>              | <b>: Environmental Division Perth</b>            |
| <b>Contact</b>                 | <b>: [REDACTED]</b>                                                      | <b>Contact</b>                 | <b>: Customer Services EP</b>                    |
| <b>Address</b>                 | <b>: 11 HARVEST TERRACE PO BOX 155<br/>WEST PERTH WA, AUSTRALIA 6006</b> | <b>Address</b>                 | <b>: 26 Rigali Way Wangara WA Australia 6065</b> |
| <b>Telephone</b>               | <b>: ----</b>                                                            | <b>Telephone</b>               | <b>: +61-8-9406 1301</b>                         |
| <b>Project</b>                 | <b>: WA_0960_PFASOMP</b>                                                 | <b>Date Samples Received</b>   | <b>: 26-Nov-2021</b>                             |
| <b>Order number</b>            | <b>: DEF19009/0960</b>                                                   | <b>Date Analysis Commenced</b> | <b>: 03-Dec-2021</b>                             |
| <b>C-O-C number</b>            | <b>: 30627</b>                                                           | <b>Issue Date</b>              | <b>: 08-Dec-2021</b>                             |
| <b>Sampler</b>                 | <b>: [REDACTED]</b>                                                      |                                |                                                  |
| <b>Site</b>                    | <b>: DEF19009/Learmonth</b>                                              |                                |                                                  |
| <b>Quote number</b>            | <b>: SY/139/19</b>                                                       |                                |                                                  |
| <b>No. of samples received</b> | <b>: 12</b>                                                              |                                |                                                  |
| <b>No. of samples analysed</b> | <b>: 12</b>                                                              |                                |                                                  |



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]         | LCMS Coordinator | Sydney Inorganics, Smithfield, NSW |
| [REDACTED]         | LCMS Coordinator | Sydney Organics, Smithfield, NSW   |





## 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**

| Sub-Matrix: <b>SOIL</b>                                       |                   |                                                |            | 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: 4056870) |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2114393-003                                                 | Anonymous         | EA055: Moisture Content                        | ----       | 0.1                               | %     | 7.6             | 7.4              | 2.8     | 0% - 20%           |
| EP2114396-001                                                 | 0960_SS227_211124 | EA055: Moisture Content                        | ----       | 0.1                               | %     | 3.7             | 3.6              | 0.0     | 0% - 20%           |
| EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4056871) |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2114396-010                                                 | 0960_SD303_211124 | EA055: Moisture Content                        | ----       | 0.1                               | %     | 22.9            | 23.3             | 1.9     | 0% - 20%           |
| EP2114475-001                                                 | Anonymous         | EA055: Moisture Content                        | ----       | 0.1                               | %     | 11.0            | 10.8             | 1.5     | 0% - 20%           |
| EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4052757)       |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2114393-001                                                 | 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 | 0.0010          | 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 | 0.0443          | 0.0470           | 5.9     | 0% - 20%           |
|                                                               |                   | EP231X: Perfluorodecane sulfonic acid (PFDS)   | 335-77-3   | 0.0002                            | mg/kg | 0.0004          | 0.0004           | 0.0     | No Limit           |
| EP2114393-011                                                 | Anonymous         | EP231X: Perfluorobutane sulfonic acid (PFBS)   | 375-73-5   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                               |                   | EP231X: Perfluoropentane sulfonic acid (PFPeS) | 2706-91-4  | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                               |                   | EP231X: Perfluorohexane sulfonic acid (PFHxS)  | 355-46-4   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                               |                   | EP231X: Perfluoroheptane sulfonic acid (PFHpS) | 375-92-8   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                               |                   | EP231X: Perfluorooctane sulfonic acid (PFOS)   | 1763-23-1  | 0.0002                            | mg/kg | 0.0004          | 0.0005           | 0.0     | No Limit           |
|                                                               |                   | EP231X: Perfluorodecane sulfonic acid (PFDS)   | 335-77-3   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
| EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4052758)       |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2114396-008                                                 | 0060_SD209_211124 | 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: 4052758) - continued |                   |                                                           |            |                                         |           |                 |                  |         |                    |
| EP2114396-008                                                       | 0060_SD209_211124 | 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           |
| EP2114472-002                                                       | Anonymous         | EP231X: Perfluorobutane sulfonic acid (PFBS)              | 375-73-5   | 0.0002                                  | mg/kg     | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                     |                   | EP231X: Perfluoropentane sulfonic acid (PFPeS)            | 2706-91-4  | 0.0002                                  | mg/kg     | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                     |                   | EP231X: Perfluorohexane sulfonic acid (PFHxS)             | 355-46-4   | 0.0002                                  | mg/kg     | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                     |                   | EP231X: Perfluoroheptane sulfonic acid (PFHpS)            | 375-92-8   | 0.0002                                  | mg/kg     | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                     |                   | EP231X: Perfluorooctane sulfonic acid (PFOS)              | 1763-23-1  | 0.0002                                  | mg/kg     | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                     |                   | EP231X: Perfluorodecane sulfonic acid (PFDS)              | 335-77-3   | 0.0002                                  | mg/kg     | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                     |                   | EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4052757) |            |                                         |           |                 |                  |         |                    |
| EP2114393-001                                                       | 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     | 0.0008          | 0.0008           | 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     | 0.0008          | 0.0008           | 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           |
|                                                                     |                   | EP2114393-011                                             | Anonymous  | 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     | <0.0002         | <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           |
| EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4052758)           |                   |                                                           |            |                                         |           |                 |                  |         |                    |
| EP2114396-008                                                       | 0060_SD209_211124 | 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: 4052758) - continued |                   |                                                                   |            |                                   |       |                 |                  |         |                    |
| EP2114396-008                                                         | 0060_SD209_211124 | 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           |
| EP2114472-002                                                         | 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           |
|                                                                       |                   | 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: 4052757)                 |                   |                                                                   |            |                                   |       |                 |                  |         |                    |
| EP2114393-001                                                         | 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           |
| EP2114393-011                                                         | Anonymous         | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                       |                   | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9  | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                       |                   | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6  | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                       |                   | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8 | 0.0005                            | mg/kg | <0.0005         | <0.0005          | 0.0     | No Limit           |
|                                                                       |                   | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2  | 0.0005                            | mg/kg | <0.0005         | <0.0005          | 0.0     | No Limit           |
|                                                                       |                   | 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: 4052758)        |                   |                                                                   |             |                                   |       |                 |                  |         |                    |
| EP2114396-008                                                | 0060_SD209_211124 | 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           |
| EP2114472-002                                                | 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           |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4052757) |                   |                                                                   |             |                                   |       |                 |                  |         |                    |
| EP2114393-001                                                | 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 | 0.0012          | 0.0011           | 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           |
| EP2114393-011                                                | Anonymous         | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.0005                            | mg/kg | <0.0005         | <0.0005          | 0.0     | No Limit           |
|                                                              |                   | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 27619-97-2  | 0.0005                            | mg/kg | <0.0005         | <0.0005          | 0.0     | No Limit           |
|                                                              |                   | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | 39108-34-4  | 0.0005                            | mg/kg | <0.0005         | <0.0005          | 0.0     | No Limit           |

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 Work Order : EP2114396  
 Client : CARDNO (WA) PTY LTD  
 Project : WA\_0960\_PFASOMP



| 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: 4052757) - continued |                   |                                                     |             |                                   |       |                 |                  |         |                    |
| EP2114393-011                                                            | Anonymous         | 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: 4052758)             |                   |                                                     |             |                                   |       |                 |                  |         |                    |
| EP2114396-008                                                            | 0060_SD209_211124 | 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           |
| EP2114472-002                                                            | 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           |





## 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**

| Sub-Matrix: SOIL                                         |            |        |       | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                    |                       |     |
|----------------------------------------------------------|------------|--------|-------|-----------------------------|---------------------------------------|--------------------|-----------------------|-----|
|                                                          |            |        |       |                             | Spike<br>Concentration                | Spike Recovery (%) | Acceptable Limits (%) |     |
| Method: Compound                                         | CAS Number | LOR    | Unit  | Result                      |                                       |                    | LCS                   | Low |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4052757)   |            |        |       |                             |                                       |                    |                       |     |
| EP231X: Perfluorobutane sulfonic acid (PFBS)             | 375-73-5   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 102                | 72.0                  | 128 |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)           | 2706-91-4  | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 107                | 73.0                  | 123 |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)            | 355-46-4   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 98.4               | 67.0                  | 130 |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)           | 375-92-8   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 89.2               | 70.0                  | 132 |
| EP231X: Perfluorooctane sulfonic acid (PFOS)             | 1763-23-1  | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 97.2               | 68.0                  | 136 |
| EP231X: Perfluorodecane sulfonic acid (PFDS)             | 335-77-3   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 97.6               | 59.0                  | 134 |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4052758)   |            |        |       |                             |                                       |                    |                       |     |
| EP231X: Perfluorobutane sulfonic acid (PFBS)             | 375-73-5   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 88.0               | 72.0                  | 128 |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)           | 2706-91-4  | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 99.6               | 73.0                  | 123 |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)            | 355-46-4   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 99.6               | 67.0                  | 130 |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)           | 375-92-8   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 92.8               | 70.0                  | 132 |
| EP231X: Perfluorooctane sulfonic acid (PFOS)             | 1763-23-1  | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 88.4               | 68.0                  | 136 |
| EP231X: Perfluorodecane sulfonic acid (PFDS)             | 335-77-3   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 90.4               | 59.0                  | 134 |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4052757) |            |        |       |                             |                                       |                    |                       |     |
| EP231X: Perfluorobutanoic acid (PFBA)                    | 375-22-4   | 0.001  | mg/kg | <0.001                      | 0.00625 mg/kg                         | 116                | 71.0                  | 135 |
| EP231X: Perfluoropentanoic acid (PFPeA)                  | 2706-90-3  | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 101                | 69.0                  | 132 |
| EP231X: Perfluorohexanoic acid (PFHxA)                   | 307-24-4   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 104                | 70.0                  | 132 |
| EP231X: Perfluoroheptanoic acid (PFHpA)                  | 375-85-9   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 113                | 71.0                  | 131 |
| EP231X: Perfluorooctanoic acid (PFOA)                    | 335-67-1   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 108                | 69.0                  | 133 |
| EP231X: Perfluorononanoic acid (PFNA)                    | 375-95-1   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 96.8               | 72.0                  | 129 |
| EP231X: Perfluorodecanoic acid (PFDA)                    | 335-76-2   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 107                | 69.0                  | 133 |
| EP231X: Perfluoroundecanoic acid (PFUnDA)                | 2058-94-8  | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 89.6               | 64.0                  | 136 |
| EP231X: Perfluorododecanoic acid (PFDoDA)                | 307-55-1   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 109                | 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                         | 116                | 69.0                  | 133 |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4052758) |            |        |       |                             |                                       |                    |                       |     |
| EP231X: Perfluorobutanoic acid (PFBA)                    | 375-22-4   | 0.001  | mg/kg | <0.001                      | 0.00625 mg/kg                         | 98.5               | 71.0                  | 135 |
| EP231X: Perfluoropentanoic acid (PFPeA)                  | 2706-90-3  | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 101                | 69.0                  | 132 |
| EP231X: Perfluorohexanoic acid (PFHxA)                   | 307-24-4   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 104                | 70.0                  | 132 |
| EP231X: Perfluoroheptanoic acid (PFHpA)                  | 375-85-9   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 108                | 71.0                  | 131 |
| EP231X: Perfluorooctanoic acid (PFOA)                    | 335-67-1   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 104                | 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                         | 99.6               | 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 |



Sub-Matrix: **SOIL**

| Sub-Matrix: SOIL                                                     |             |        |       | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |     |
|----------------------------------------------------------------------|-------------|--------|-------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|-----|
|                                                                      |             |        |       |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |     |
| Method: Compound                                                     | CAS Number  | LOR    | Unit  | Result                      |                                       |                           |                                   |     |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4052758) - continued |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: Perfluorododecanoic acid (PFDoDA)                            | 307-55-1    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 101                       | 69.0                              | 135 |
| EP231X: Perfluorotridecanoic acid (PFTrDA)                           | 72629-94-8  | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 91.6                      | 66.0                              | 139 |
| EP231X: Perfluorotetradecanoic acid (PFTeDA)                         | 376-06-7    | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 112                       | 69.0                              | 133 |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4052757)                 |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: Perfluorooctane sulfonamide (FOSA)                           | 754-91-6    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 100                       | 67.0                              | 137 |
| EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)                | 31506-32-8  | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 104                       | 71.6                              | 129 |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)                 | 4151-50-2   | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 97.1                      | 69.8                              | 131 |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)         | 24448-09-7  | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 101                       | 68.7                              | 130 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)          | 1691-99-2   | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 114                       | 65.1                              | 134 |
| 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                         | 84.0                      | 61.0                              | 139 |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4052758)                 |             |        |       |                             |                                       |                           |                                   |     |
| 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                         | 114                       | 71.6                              | 129 |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)                 | 4151-50-2   | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 81.2                      | 69.8                              | 131 |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)         | 24448-09-7  | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 104                       | 68.7                              | 130 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)          | 1691-99-2   | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 110                       | 65.1                              | 134 |
| 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                         | 86.8                      | 61.0                              | 139 |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4052757)          |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                    | 757124-72-4 | 0.0005 | mg/kg | <0.0005                     | 0.00125 mg/kg                         | 127                       | 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                         | 118                       | 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                         | 96.8                      | 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                         | 70.8                      | 69.2                              | 143 |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4052758)          |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                    | 757124-72-4 | 0.0005 | mg/kg | <0.0005                     | 0.00125 mg/kg                         | 111                       | 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                         | 108                       | 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                         | 117                       | 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                         | 101                       | 69.2                              | 143 |



## 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**

| 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: 4052757)   |                   |                                                |            |                          |                  |                       |      |
| EP2114393-001                                            | Anonymous         | EP231X: Perfluorobutane sulfonic acid (PFBS)   | 375-73-5   | 0.00125 mg/kg            | 91.2             | 72.0                  | 128  |
|                                                          |                   | EP231X: Perfluoropentane sulfonic acid (PFPeS) | 2706-91-4  | 0.00125 mg/kg            | 101              | 73.0                  | 123  |
|                                                          |                   | EP231X: Perfluorohexane sulfonic acid (PFHxS)  | 355-46-4   | 0.00125 mg/kg            | 85.6             | 67.0                  | 130  |
|                                                          |                   | EP231X: Perfluoroheptane sulfonic acid (PFHpS) | 375-92-8   | 0.00125 mg/kg            | 95.6             | 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            | 61.2             | 59.0                  | 134  |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4052758)   |                   |                                                |            |                          |                  |                       |      |
| EP2114396-008                                            | 0060_SD209_211124 | EP231X: Perfluorobutane sulfonic acid (PFBS)   | 375-73-5   | 0.00125 mg/kg            | 91.6             | 72.0                  | 128  |
|                                                          |                   | EP231X: Perfluoropentane sulfonic acid (PFPeS) | 2706-91-4  | 0.00125 mg/kg            | 107              | 73.0                  | 123  |
|                                                          |                   | EP231X: Perfluorohexane sulfonic acid (PFHxS)  | 355-46-4   | 0.00125 mg/kg            | 108              | 67.0                  | 130  |
|                                                          |                   | EP231X: Perfluoroheptane sulfonic acid (PFHpS) | 375-92-8   | 0.00125 mg/kg            | 102              | 70.0                  | 132  |
|                                                          |                   | EP231X: Perfluorooctane sulfonic acid (PFOS)   | 1763-23-1  | 0.00125 mg/kg            | 102              | 68.0                  | 136  |
|                                                          |                   | EP231X: Perfluorodecane sulfonic acid (PFDS)   | 335-77-3   | 0.00125 mg/kg            | 103              | 59.0                  | 134  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4052757) |                   |                                                |            |                          |                  |                       |      |
| EP2114393-001                                            | Anonymous         | EP231X: Perfluorobutanoic acid (PFBA)          | 375-22-4   | 0.00625 mg/kg            | 111              | 71.0                  | 135  |
|                                                          |                   | EP231X: Perfluoropentanoic acid (PFPeA)        | 2706-90-3  | 0.00125 mg/kg            | 102              | 69.0                  | 132  |
|                                                          |                   | EP231X: Perfluorohexanoic acid (PFHxA)         | 307-24-4   | 0.00125 mg/kg            | 91.6             | 70.0                  | 132  |
|                                                          |                   | EP231X: Perfluoroheptanoic acid (PFHpA)        | 375-85-9   | 0.00125 mg/kg            | 108              | 71.0                  | 131  |
|                                                          |                   | EP231X: Perfluorooctanoic acid (PFOA)          | 335-67-1   | 0.00125 mg/kg            | 93.6             | 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            | 102              | 69.0                  | 133  |
|                                                          |                   | EP231X: Perfluoroundecanoic acid (PFUnDA)      | 2058-94-8  | 0.00125 mg/kg            | 82.4             | 64.0                  | 136  |
|                                                          |                   | EP231X: Perfluorododecanoic acid (PFDoDA)      | 307-55-1   | 0.00125 mg/kg            | 96.4             | 69.0                  | 135  |
|                                                          |                   | EP231X: Perfluorotridecanoic acid (PFTTrDA)    | 72629-94-8 | 0.00125 mg/kg            | 96.4             | 66.0                  | 139  |
|                                                          |                   | EP231X: Perfluorotetradecanoic acid (PFTeDA)   | 376-06-7   | 0.00312 mg/kg            | 111              | 69.0                  | 133  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4052758) |                   |                                                |            |                          |                  |                       |      |
| EP2114396-008                                            | 0060_SD209_211124 | 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            | 119              | 69.0                  | 132  |
|                                                          |                   | EP231X: Perfluorohexanoic acid (PFHxA)         | 307-24-4   | 0.00125 mg/kg            | 118              | 70.0                  | 132  |
|                                                          |                   | EP231X: Perfluoroheptanoic acid (PFHpA)        | 375-85-9   | 0.00125 mg/kg            | 113              | 71.0                  | 131  |
|                                                          |                   | EP231X: Perfluorooctanoic acid (PFOA)          | 335-67-1   | 0.00125 mg/kg            | 114              | 69.0                  | 133  |
|                                                          |                   | EP231X: Perfluorononanoic acid (PFNA)          | 375-95-1   | 0.00125 mg/kg            | 106              | 72.0                  | 129  |
|                                                          |                   | EP231X: Perfluorodecanoic acid (PFDA)          | 335-76-2   | 0.00125 mg/kg            | 104              | 69.0                  | 133  |



Sub-Matrix: **SOIL**

| 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: 4052758) - continued |                   |                                                                   |             |                          |                  |                       |      |
| EP2114396-008                                                        | 0060_SD209_211124 | EP231X: Perfluoroundecanoic acid (PFUnDA)                         | 2058-94-8   | 0.00125 mg/kg            | 96.8             | 64.0                  | 136  |
|                                                                      |                   | EP231X: Perfluorododecanoic acid (PFDoDA)                         | 307-55-1    | 0.00125 mg/kg            | 111              | 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            | 121              | 69.0                  | 133  |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4052757)                 |                   |                                                                   |             |                          |                  |                       |      |
| EP2114393-001                                                        | Anonymous         | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.00125 mg/kg            | 112              | 67.0                  | 137  |
|                                                                      |                   | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.00312 mg/kg            | 101              | 71.6                  | 129  |
|                                                                      |                   | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.00312 mg/kg            | 97.4             | 69.8                  | 131  |
|                                                                      |                   | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.00312 mg/kg            | 94.6             | 68.7                  | 130  |
|                                                                      |                   | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.00312 mg/kg            | 103              | 65.1                  | 134  |
|                                                                      |                   | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9   | 0.00125 mg/kg            | 108              | 63.0                  | 144  |
|                                                                      |                   | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.00125 mg/kg            | 101              | 61.0                  | 139  |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4052758)                 |                   |                                                                   |             |                          |                  |                       |      |
| EP2114396-008                                                        | 0060_SD209_211124 | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.00125 mg/kg            | 107              | 67.0                  | 137  |
|                                                                      |                   | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.00312 mg/kg            | 122              | 71.6                  | 129  |
|                                                                      |                   | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.00312 mg/kg            | 106              | 69.8                  | 131  |
|                                                                      |                   | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.00312 mg/kg            | 113              | 68.7                  | 130  |
|                                                                      |                   | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.00312 mg/kg            | 118              | 65.1                  | 134  |
|                                                                      |                   | 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            | 100              | 61.0                  | 139  |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4052757)          |                   |                                                                   |             |                          |                  |                       |      |
| EP2114393-001                                                        | Anonymous         | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.00125 mg/kg            | 124              | 62.0                  | 145  |
|                                                                      |                   | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 27619-97-2  | 0.00125 mg/kg            | 115              | 64.0                  | 140  |
|                                                                      |                   | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | 39108-34-4  | 0.00125 mg/kg            | 78.0             | 65.0                  | 137  |
|                                                                      |                   | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | 120226-60-0 | 0.00125 mg/kg            | 75.6             | 69.2                  | 143  |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4052758)          |                   |                                                                   |             |                          |                  |                       |      |
| EP2114396-008                                                        | 0060_SD209_211124 | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.00125 mg/kg            | 119              | 62.0                  | 145  |
|                                                                      |                   | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 27619-97-2  | 0.00125 mg/kg            | 129              | 64.0                  | 140  |



Sub-Matrix: SOIL

| Sub-Matrix: <b>SOIL</b>                                                 |                   |                                                     |             | 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: 4052758) - continued |                   |                                                     |             |                          |                  |                       |      |
| EP2114396-008                                                           | 0060_SD209_211124 | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)   | 39108-34-4  | 0.00125 mg/kg            | 126              | 65.0                  | 137  |
|                                                                         |                   | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS) | 120226-60-0 | 0.00125 mg/kg            | 84.8             | 69.2                  | 143  |



## QA/QC Compliance Assessment to assist with Quality Review

Work Order : EP2114396

Page : 1 of 5

Client : CARDNO (WA) PTY LTD

Laboratory : Environmental Division Perth

Contact : [REDACTED] [REDACTED]

Telephone : +61-8-9406 1301

Project : WA\_0960\_PFASOMP

Date Samples Received : 26-Nov-2021

Site : DEF19009/Learmonth

Issue Date : 08-Dec-2021

Sampler : [REDACTED] [REDACTED] [REDACTED]

No. of samples received : 12

Order number : DEF19009/0960

No. of samples analysed : 12

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

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

### Summary of Outliers

#### Outliers : Quality Control Samples

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

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- 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.**

*Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes*

| Compound Group Name                   | Laboratory Sample ID | Client Sample ID | Analyte                                     | CAS Number | Data           | Limits | Comment                                                                                      |
|---------------------------------------|----------------------|------------------|---------------------------------------------|------------|----------------|--------|----------------------------------------------------------------------------------------------|
| <b>Matrix Spike (MS) Recoveries</b>   |                      |                  |                                             |            |                |        |                                                                                              |
| EP231A: Perfluoroalkyl Sulfonic Acids | EP2114393--001       | Anonymous        | <b>Perfluorooctane sulfonic acid (PFOS)</b> | 1763-23-1  | Not Determined | ----   | <b>MS recovery not determined, background level greater than or equal to 4x spike level.</b> |

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.

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                      | Sample Date       | Extraction / Preparation |                    |            | Analysis      |                  |            |                    |
|---------------------------------------------|-------------------|--------------------------|--------------------|------------|---------------|------------------|------------|--------------------|
| Container / Client Sample ID(s)             |                   | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |                    |
| EA055: Moisture Content (Dried @ 105-110°C) |                   |                          |                    |            |               |                  |            |                    |
| HDPE Soil Jar (EA055)                       | 24-Nov-2021       | ----                     | ----               | ----       | 06-Dec-2021   | 08-Dec-2021      | ✓          |                    |
| 0960_SS227_211124,                          |                   |                          |                    |            |               |                  |            | 0960_QC121_211124, |
| 0960_SS291_211124,                          |                   |                          |                    |            |               |                  |            | 0960_SS293_211124, |
| 0960_SS198_211124,                          |                   |                          |                    |            |               |                  |            | 0960_QC125_211124, |
| 0960_SD210_211124,                          |                   |                          |                    |            |               |                  |            | 0060_SD209_211124, |
| 0960_SD302_211124,                          |                   |                          |                    |            |               |                  |            | 0960_SD303_211124, |
| 0960_SS292_211124,                          | 0960_SD207_211124 |                          |                    |            |               |                  |            |                    |
| EP231A: Perfluoroalkyl Sulfonic Acids       |                   |                          |                    |            |               |                  |            |                    |
| HDPE Soil Jar (EP231X)                      | 24-Nov-2021       | 03-Dec-2021              | 23-May-2022        | ✓          | 06-Dec-2021   | 12-Jan-2022      | ✓          |                    |
| 0960_SS227_211124,                          |                   |                          |                    |            |               |                  |            | 0960_QC121_211124, |
| 0960_SS291_211124,                          |                   |                          |                    |            |               |                  |            | 0960_SS293_211124, |
| 0960_SS198_211124,                          |                   |                          |                    |            |               |                  |            | 0960_QC125_211124, |
| 0960_SD210_211124                           |                   |                          |                    |            |               |                  |            |                    |
| HDPE Soil Jar (EP231X)                      | 24-Nov-2021       | 03-Dec-2021              | 23-May-2022        | ✓          | 07-Dec-2021   | 12-Jan-2022      | ✓          |                    |
| 0060_SD209_211124,                          |                   |                          |                    |            |               |                  |            | 0960_SD302_211124, |
| 0960_SD303_211124,                          |                   |                          |                    |            |               |                  |            | 0960_SS292_211124, |
| 0960_SD207_211124                           |                   |                          |                    |            |               |                  |            |                    |



Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                                                                                        |                                                                | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |
|---------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|
| Container / Client Sample ID(s)                                                                               |                                                                |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| EP231B: Perfluoroalkyl Carboxylic Acids                                                                       |                                                                |             |                          |                    |            |               |                  |            |
| HDPE Soil Jar (EP231X)<br>0960_SS227_211124,<br>0960_SS291_211124,<br>0960_SS198_211124,<br>0960_SD210_211124 | 0960_QC121_211124,<br>0960_SS293_211124,<br>0960_QC125_211124, | 24-Nov-2021 | 03-Dec-2021              | 23-May-2022        | ✔          | 06-Dec-2021   | 12-Jan-2022      | ✔          |
| HDPE Soil Jar (EP231X)<br>0060_SD209_211124,<br>0960_SD303_211124,<br>0960_SD207_211124                       | 0960_SD302_211124,<br>0960_SS292_211124,                       | 24-Nov-2021 | 03-Dec-2021              | 23-May-2022        | ✔          | 07-Dec-2021   | 12-Jan-2022      | ✔          |
| EP231C: Perfluoroalkyl Sulfonamides                                                                           |                                                                |             |                          |                    |            |               |                  |            |
| HDPE Soil Jar (EP231X)<br>0960_SS227_211124,<br>0960_SS291_211124,<br>0960_SS198_211124,<br>0960_SD210_211124 | 0960_QC121_211124,<br>0960_SS293_211124,<br>0960_QC125_211124, | 24-Nov-2021 | 03-Dec-2021              | 23-May-2022        | ✔          | 06-Dec-2021   | 12-Jan-2022      | ✔          |
| HDPE Soil Jar (EP231X)<br>0060_SD209_211124,<br>0960_SD303_211124,<br>0960_SD207_211124                       | 0960_SD302_211124,<br>0960_SS292_211124,                       | 24-Nov-2021 | 03-Dec-2021              | 23-May-2022        | ✔          | 07-Dec-2021   | 12-Jan-2022      | ✔          |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids                                                                    |                                                                |             |                          |                    |            |               |                  |            |
| HDPE Soil Jar (EP231X)<br>0960_SS227_211124,<br>0960_SS291_211124,<br>0960_SS198_211124,<br>0960_SD210_211124 | 0960_QC121_211124,<br>0960_SS293_211124,<br>0960_QC125_211124, | 24-Nov-2021 | 03-Dec-2021              | 23-May-2022        | ✔          | 06-Dec-2021   | 12-Jan-2022      | ✔          |
| HDPE Soil Jar (EP231X)<br>0060_SD209_211124,<br>0960_SD303_211124,<br>0960_SD207_211124                       | 0960_SD302_211124,<br>0960_SS292_211124,                       | 24-Nov-2021 | 03-Dec-2021              | 23-May-2022        | ✔          | 07-Dec-2021   | 12-Jan-2022      | ✔          |
| EP231P: PFAS Sums                                                                                             |                                                                |             |                          |                    |            |               |                  |            |
| HDPE Soil Jar (EP231X)<br>0960_SS227_211124,<br>0960_SS291_211124,<br>0960_SS198_211124,<br>0960_SD210_211124 | 0960_QC121_211124,<br>0960_SS293_211124,<br>0960_QC125_211124, | 24-Nov-2021 | 03-Dec-2021              | 23-May-2022        | ✔          | 06-Dec-2021   | 12-Jan-2022      | ✔          |
| HDPE Soil Jar (EP231X)<br>0060_SD209_211124,<br>0960_SD303_211124,<br>0960_SD207_211124                       | 0960_SD302_211124,<br>0960_SS292_211124,                       | 24-Nov-2021 | 03-Dec-2021              | 23-May-2022        | ✔          | 07-Dec-2021   | 12-Jan-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                          |        | Count |         | Rate (%) |          |            | Quality Control Specification  |
|------------------------------------------------------|--------|-------|---------|----------|----------|------------|--------------------------------|
| Analytical Methods                                   | Method | QC    | Regular | Actual   | Expected | Evaluation |                                |
| Laboratory Duplicates (DUP)                          |        |       |         |          |          |            |                                |
| Moisture Content                                     | EA055  | 4     | 40      | 10.00    | 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 |



## Brief Method Summaries

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

| Analytical Methods                                   | Method | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------------------------------------------|--------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Moisture Content                                     | EA055  | SOIL   | In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | SOIL   | In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements. |
| Preparation Methods                                  | Method | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| QuEChERS Extraction of Solids                        | ORG71  | SOIL   | In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.                                                                                                                                                                                                                                   |



**CHAIN OF CUSTODY**

ALS COC#: 30634 ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: MG - DEF19009/Learmonth SED

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:  
/ ES2019CARBSD0002**LABORATORY USE ONLY (Circle)**

Custody Seal intact? Yes 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 | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|-------------------|-------------|------------------------|--------|----------------------|---------|--------------------|----------------------|------------------------|
| 001    | 0960_SS123_211124 |             | 24/11/2021<br>11:55 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 002    | 0960_QC122_211124 |             | 24/11/2021<br>11:55 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 003    | 0960_SS121_211124 |             | 24/11/2021<br>01:36 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 004    | 0960_SS122_211124 |             | 24/11/2021<br>01:42 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |



# CHAIN OF CUSTODY

ALS COC#: 30634

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: MG - DEF19009/Learmonth SED

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:

/ ES2019CARBSD0002

## LABORATORY USE ONLY (Circle)

Custody Seal intact?

Yes 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    | 0960_SS123_211124 | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 002    | 0960_QC122_211124 | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 003    | 0960_SS121_211124 | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 004    | 0960_SS122_211124 | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |



# CHAIN OF CUSTODY

COC#: 30634

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: MG - DEF19009/Learmonth SED

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:

/ ES2019CARBSD0002

## LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes 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    | 0960_SS123_211124 | HDPE Soil Jar | 200 mL | 00620719063183 | Grey | No       |        |
| 002    | 0960_QC122_211124 | HDPE Soil Jar | 200 mL | 00620719063188 | Grey | No       |        |
| 003    | 0960_SS121_211124 | HDPE Soil Jar | 200 mL | 00621019107806 | Grey | No       |        |
| 004    | 0960_SS122_211124 | HDPE Soil Jar | 200 mL | 00621019097716 | Grey | No       |        |

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

## SAMPLE RECEIPT NOTIFICATION (SRN)

**Work Order : EP2114397**

|                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Client : <b>CARDNO (WA) PTY LTD</b></p> <p>Contact : [REDACTED]</p> <p>Address : 11 HARVEST TERRACE PO BOX 155<br/>WEST PERTH WA, AUSTRALIA 6006</p> <p>E-mail : [REDACTED]@cardno.com.au</p> <p>Telephone : ----</p> <p>Facsimile : ----</p> <p>Project : WA_0960_PFASOMP</p> <p>Order number : DEF19009/0960</p> <p>C-O-C number : 30634</p> <p>Site : DEF19009/Learmonth</p> <p>Sampler : [REDACTED]</p> | <p>Laboratory : Environmental Division Perth</p> <p>Contact : Customer Services EP</p> <p>Address : 26 Rigali Way Wangara WA Australia<br/>6065</p> <p>E-mail : ALSEnviro.Perth@alsglobal.com</p> <p>Telephone : +61-8-9406 1301</p> <p>Facsimile : +61-8-9406 1399</p> <p>Page : 1 of 2</p> <p>Quote number : ES2019CARBSD0002 (SY/139/19)</p> <p>QC Level : NEPM 2013 B3 &amp; ALS QC Standard</p> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Dates

|                                           |                                               |
|-------------------------------------------|-----------------------------------------------|
| Date Samples Received : 26-Nov-2021 09:55 | Issue Date : 26-Nov-2021                      |
| Client Requested Due Date : 08-Dec-2021   | Scheduled Reporting Date : <b>08-Dec-2021</b> |

### Delivery Details

|                             |                                            |
|-----------------------------|--------------------------------------------|
| Mode of Delivery : Carrier  | Security Seal : Not Available              |
| No. of coolers/boxes : 3    | Temperature : 24.8 - Ice present           |
| Receipt Detail : Ice Melted | 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
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepancies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **PFAS analysis will be conducted by ALS Environmental, Sydney, NATA accreditation no. 825, Site No. 10911.**
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.



## Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exists.

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: SOIL

| Laboratory sample ID | Sampling date / time | Sample ID         | SOIL - EA055-103 Moisture Content | SOIL - EP231X (solids) PFAS - Full Suite (28 analytes) |
|----------------------|----------------------|-------------------|-----------------------------------|--------------------------------------------------------|
| EP2114397-001        | 24-Nov-2021 11:55    | 0960_SS123_211124 | ✓                                 | ✓                                                      |
| EP2114397-002        | 24-Nov-2021 11:55    | 0960_QC122_211124 | ✓                                 | ✓                                                      |
| EP2114397-003        | 24-Nov-2021 13:36    | 0960_SS121_211124 | ✓                                 | ✓                                                      |
| EP2114397-004        | 24-Nov-2021 13:42    | 0960_SS122_211124 | ✓                                 | ✓                                                      |

## Proactive Holding Time Report

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

## Requested Deliverables

|                                                                                                                  |       |                              |
|------------------------------------------------------------------------------------------------------------------|-------|------------------------------|
| <ul style="list-style-type: none"> <li>- A4 - AU Tax Invoice (INV)</li> </ul>                                    | Email | cardno.com.au                |
| <b>DERP LAB REPORTS</b>                                                                                          |       |                              |
| <ul style="list-style-type: none"> <li>- EDI Format - ESDAT (ESDAT)</li> </ul>                                   | Email | derp.labreports@esdat.com.au |
| <ul style="list-style-type: none"> <li>- *AU Certificate of Analysis - NATA (COA)</li> </ul>                     | Email | cardno.com.au                |
| <ul style="list-style-type: none"> <li>- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)</li> </ul>    | Email | cardno.com.au                |
| <ul style="list-style-type: none"> <li>- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)</li> </ul>            | Email | cardno.com.au                |
| <ul style="list-style-type: none"> <li>- A4 - AU Sample Receipt Notification - Environmental HT (SRN)</li> </ul> | Email | cardno.com.au                |
| <ul style="list-style-type: none"> <li>- Chain of Custody (CoC) (COC)</li> </ul>                                 | Email | cardno.com.au                |
| <ul style="list-style-type: none"> <li>- EDI Format - ESDAT (ESDAT)</li> </ul>                                   | Email | cardno.com.au                |
| <ul style="list-style-type: none"> <li>- EDI Format - XTab (XTAB)</li> </ul>                                     | Email | cardno.com.au                |
| <b>Perth</b>                                                                                                     |       |                              |
| <ul style="list-style-type: none"> <li>- A4 - AU Tax Invoice (INV)</li> </ul>                                    | Email | perth@cardno.com.au          |



## CERTIFICATE OF ANALYSIS

**Work Order** : EP2114397  
**Client** : CARDNO (WA) PTY LTD  
**Contact** : [REDACTED]  
**Address** : 11 HARVEST TERRACE PO BOX 155  
 WEST PERTH WA, AUSTRALIA 6006  
**Telephone** : ----  
**Project** : WA\_0960\_PFASOMP  
**Order number** : DEF19009/0960  
**C-O-C number** : 30634  
**Sampler** : [REDACTED]  
**Site** : DEF19009/Learmonth  
**Quote number** : SY/139/19  
**No. of samples received** : 4  
**No. of samples analysed** : 4

**Page** : 1 of 5  
**Laboratory** : Environmental Division Perth  
**Contact** : Customer Services EP  
**Address** : 26 Rigali Way Wangara WA Australia 6065  
**Telephone** : +61-8-9406 1301  
**Date Samples Received** : 26-Nov-2021 09:55  
**Date Analysis Commenced** : 03-Dec-2021  
**Issue Date** : 08-Dec-2021 09:57



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             |
|------------------------------------------------------------------------|------------------|------------------------------------|
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator | Sydney Inorganics, Smithfield, NSW |
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator | Sydney Organics, Smithfield, NSW   |



## 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.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- 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

|                                                    |            |        |       | 0960_SS123_211124 | 0960_QC122_211124 | 0960_SS121_211124 | 0960_SS122_211124 | ----  |
|----------------------------------------------------|------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------|
| Sampling date / time                               |            |        |       | 24-Nov-2021 11:55 | 24-Nov-2021 11:55 | 24-Nov-2021 13:36 | 24-Nov-2021 13:42 | ----  |
| Compound                                           | CAS Number | LOR    | Unit  | EP2114397-001     | EP2114397-002     | EP2114397-003     | EP2114397-004     | ----- |
|                                                    |            |        |       | Result            | Result            | Result            | Result            | ----  |
| <b>EA055: Moisture Content (Dried @ 105-110°C)</b> |            |        |       |                   |                   |                   |                   |       |
| Moisture Content                                   | ----       | 0.1    | %     | 1.2               | 0.9               | 1.8               | 1.7               | ----  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>       |            |        |       |                   |                   |                   |                   |       |
| 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            | 0.0005            | 0.0007            | 0.0004            | ----  |
| 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 | 0.0323            | 0.0347            | 0.0268            | 0.0150            | ----  |
| Perfluorodecane sulfonic acid (PFDS)               | 335-77-3   | 0.0002 | mg/kg | 0.0012            | 0.0010            | 0.0034            | 0.0002            | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>     |            |        |       |                   |                   |                   |                   |       |
| 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           | 0.0007            | <0.0002           | ----  |
| Perfluoroundecanoic acid (PFUnDA)                  | 2058-94-8  | 0.0002 | mg/kg | <0.0002           | <0.0002           | 0.0004            | <0.0002           | ----  |
| Perfluorododecanoic acid (PFDoDA)                  | 307-55-1   | 0.0002 | mg/kg | <0.0002           | <0.0002           | 0.0003            | <0.0002           | ----  |
| 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           | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>         |            |        |       |                   |                   |                   |                   |       |
| 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<br>(Matrix: SOIL)                    |                    |        |       | Sample ID | 0960_SS123_211124 | 0960_QC122_211124 | 0960_SS121_211124 | 0960_SS122_211124 | ----  |
|-----------------------------------------------------------|--------------------|--------|-------|-----------|-------------------|-------------------|-------------------|-------------------|-------|
| Sampling date / time                                      |                    |        |       |           | 24-Nov-2021 11:55 | 24-Nov-2021 11:55 | 24-Nov-2021 13:36 | 24-Nov-2021 13:42 | ----  |
| Compound                                                  | CAS Number         | LOR    | Unit  |           | EP2114397-001     | EP2114397-002     | EP2114397-003     | EP2114397-004     | ----- |
|                                                           |                    |        |       | Result    | Result            | Result            | Result            | Result            | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides - Continued</b>    |                    |        |       |           |                   |                   |                   |                   |       |
| 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           | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>         |                    |        |       |           |                   |                   |                   |                   |       |
| 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           | ----  |
| <b>EP231P: PFAS Sums</b>                                  |                    |        |       |           |                   |                   |                   |                   |       |
| Sum of PFAS                                               | ----               | 0.0002 | mg/kg | 0.0338    | 0.0362            | 0.0323            | 0.0156            | 0.0156            | ----  |
| Sum of PFHxS and PFOS                                     | 355-46-4/1763-23-1 | 0.0002 | mg/kg | 0.0326    | 0.0352            | 0.0275            | 0.0154            | 0.0154            | ----  |
| Sum of PFAS (WA DER List)                                 | ----               | 0.0002 | mg/kg | 0.0326    | 0.0352            | 0.0275            | 0.0154            | 0.0154            | ----  |
| <b>EP231S: PFAS Surrogate</b>                             |                    |        |       |           |                   |                   |                   |                   |       |
| 13C4-PFOS                                                 | ----               | 0.0002 | %     | 96.0      | 90.5              | 93.0              | 83.5              | 83.5              | ----  |
| 13C8-PFOA                                                 | ----               | 0.0002 | %     | 104       | 96.5              | 98.5              | 91.0              | 91.0              | ----  |

Page : 5 of 5  
Work Order : EP2114397  
Client : CARDNO (WA) PTY LTD  
Project : WA\_0960\_PFASOMP



## Surrogate Control Limits

| Sub-Matrix: <b>SEDIMENT</b>   |            | Recovery Limits (%) |      |
|-------------------------------|------------|---------------------|------|
| Compound                      | CAS Number | Low                 | High |
| <b>EP231S: PFAS Surrogate</b> |            |                     |      |
| <b>13C4-PFOS</b>              | ----       | 60                  | 120  |
| <b>13C8-PFOA</b>              | ----       | 60                  | 120  |

## Inter-Laboratory Testing

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



## QUALITY CONTROL REPORT

|                                |                                                                          |                                |                                                  |
|--------------------------------|--------------------------------------------------------------------------|--------------------------------|--------------------------------------------------|
| <b>Work Order</b>              | <b>: EP2114397</b>                                                       | <b>Page</b>                    | <b>: 1 of 7</b>                                  |
| <b>Client</b>                  | <b>: CARDNO (WA) PTY LTD</b>                                             | <b>Laboratory</b>              | <b>: Environmental Division Perth</b>            |
| <b>Contact</b>                 | <b>: [REDACTED]</b>                                                      | <b>Contact</b>                 | <b>: Customer Services EP</b>                    |
| <b>Address</b>                 | <b>: 11 HARVEST TERRACE PO BOX 155<br/>WEST PERTH WA, AUSTRALIA 6006</b> | <b>Address</b>                 | <b>: 26 Rigali Way Wangara WA Australia 6065</b> |
| <b>Telephone</b>               | <b>: ----</b>                                                            | <b>Telephone</b>               | <b>: +61-8-9406 1301</b>                         |
| <b>Project</b>                 | <b>: WA_0960_PFASOMP</b>                                                 | <b>Date Samples Received</b>   | <b>: 26-Nov-2021</b>                             |
| <b>Order number</b>            | <b>: DEF19009/0960</b>                                                   | <b>Date Analysis Commenced</b> | <b>: 03-Dec-2021</b>                             |
| <b>C-O-C number</b>            | <b>: 30634</b>                                                           | <b>Issue Date</b>              | <b>: 08-Dec-2021</b>                             |
| <b>Sampler</b>                 | <b>: [REDACTED]</b>                                                      |                                |                                                  |
| <b>Site</b>                    | <b>: DEF19009/Learmonth</b>                                              |                                |                                                  |
| <b>Quote number</b>            | <b>: SY/139/19</b>                                                       |                                |                                                  |
| <b>No. of samples received</b> | <b>: 4</b>                                                               |                                |                                                  |
| <b>No. of samples analysed</b> | <b>: 4</b>                                                               |                                |                                                  |



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]  | LCMS Coordinator | Sydney Inorganics, Smithfield, NSW |
| [REDACTED]  | LCMS Coordinator | Sydney Organics, Smithfield, NSW   |



## 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**

| Sub-Matrix: <b>SOIL</b>                                       |           |                                                |            | 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: 4056871) |           |                                                |            |                                   |       |                 |                  |         |                    |
| EP2114396-010                                                 | Anonymous | EA055: Moisture Content                        | ----       | 0.1                               | %     | 22.9            | 23.3             | 1.9     | 0% - 20%           |
| EP2114475-001                                                 | Anonymous | EA055: Moisture Content                        | ----       | 0.1                               | %     | 11.0            | 10.8             | 1.5     | 0% - 20%           |
| EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4052758)       |           |                                                |            |                                   |       |                 |                  |         |                    |
| EP2114396-008                                                 | 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           |
| EP2114472-002                                                 | Anonymous | EP231X: Perfluorobutane sulfonic acid (PFBS)   | 375-73-5   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                               |           | EP231X: Perfluoropentane sulfonic acid (PFPeS) | 2706-91-4  | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                               |           | EP231X: Perfluorohexane sulfonic acid (PFHxS)  | 355-46-4   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                               |           | EP231X: Perfluoroheptane sulfonic acid (PFHpS) | 375-92-8   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                               |           | EP231X: Perfluorooctane sulfonic acid (PFOS)   | 1763-23-1  | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                               |           | EP231X: Perfluorodecane sulfonic acid (PFDS)   | 335-77-3   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
| EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4052758)     |           |                                                |            |                                   |       |                 |                  |         |                    |
| EP2114396-008                                                 | 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           |



| 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: 4052758) - continued |           |                                                                   |            |                                   |       |                 |                  |         |                    |
| EP2114396-008                                                         | 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           |
| EP2114472-002                                                         | 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           |
|                                                                       |           | 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: 4052758)                 |           |                                                                   |            |                                   |       |                 |                  |         |                    |
| EP2114396-008                                                         | 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           |
| EP2114472-002                                                         | 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           |

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 Work Order : EP2114397  
 Client : CARDNO (WA) PTY LTD  
 Project : WA\_0960\_PFASOMP



| Sub-Matrix: <b>SOIL</b>                                             |           |                                                     |             | Laboratory Duplicate (DUP) Report |       |                 |                  |         |                    |
|---------------------------------------------------------------------|-----------|-----------------------------------------------------|-------------|-----------------------------------|-------|-----------------|------------------|---------|--------------------|
| Laboratory sample ID                                                | Sample ID | Method: Compound                                    | CAS Number  | LOR                               | Unit  | Original Result | Duplicate Result | RPD (%) | Acceptable RPD (%) |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4052758)</b> |           |                                                     |             |                                   |       |                 |                  |         |                    |
| EP2114396-008                                                       | 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           |
| EP2114472-002                                                       | 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           |



## 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**

| Sub-Matrix: SOIL                                                  |             |        |       | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |     |
|-------------------------------------------------------------------|-------------|--------|-------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|-----|
|                                                                   |             |        |       |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |     |
| Method: Compound                                                  | CAS Number  | LOR    | Unit  | Result                      |                                       |                           |                                   |     |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4052758)            |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: Perfluorobutane sulfonic acid (PFBS)                      | 375-73-5    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 88.0                      | 72.0                              | 128 |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)                    | 2706-91-4   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 99.6                      | 73.0                              | 123 |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)                     | 355-46-4    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 99.6                      | 67.0                              | 130 |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)                    | 375-92-8    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 92.8                      | 70.0                              | 132 |
| EP231X: Perfluorooctane sulfonic acid (PFOS)                      | 1763-23-1   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 88.4                      | 68.0                              | 136 |
| EP231X: Perfluorodecane sulfonic acid (PFDS)                      | 335-77-3    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 90.4                      | 59.0                              | 134 |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4052758)          |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: Perfluorobutanoic acid (PFBA)                             | 375-22-4    | 0.001  | mg/kg | <0.001                      | 0.00625 mg/kg                         | 98.5                      | 71.0                              | 135 |
| EP231X: Perfluoropentanoic acid (PFPeA)                           | 2706-90-3   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 101                       | 69.0                              | 132 |
| EP231X: Perfluorohexanoic acid (PFHxA)                            | 307-24-4    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 104                       | 70.0                              | 132 |
| EP231X: Perfluoroheptanoic acid (PFHpA)                           | 375-85-9    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 108                       | 71.0                              | 131 |
| EP231X: Perfluorooctanoic acid (PFOA)                             | 335-67-1    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 104                       | 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                         | 99.6                      | 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                         | 101                       | 69.0                              | 135 |
| EP231X: Perfluorotridecanoic acid (PFTrDA)                        | 72629-94-8  | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 91.6                      | 66.0                              | 139 |
| EP231X: Perfluorotetradecanoic acid (PFTeDA)                      | 376-06-7    | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 112                       | 69.0                              | 133 |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4052758)              |             |        |       |                             |                                       |                           |                                   |     |
| 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                         | 114                       | 71.6                              | 129 |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 81.2                      | 69.8                              | 131 |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 104                       | 68.7                              | 130 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 110                       | 65.1                              | 134 |
| 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                         | 86.8                      | 61.0                              | 139 |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4052758)       |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.0005 | mg/kg | <0.0005                     | 0.00125 mg/kg                         | 111                       | 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                         | 108                       | 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                         | 117                       | 65.0                              | 137 |





| Sub-Matrix: SOIL                                                        |             |        |       | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                    |                       |      |
|-------------------------------------------------------------------------|-------------|--------|-------|-----------------------------|---------------------------------------|--------------------|-----------------------|------|
| Method: Compound                                                        | CAS Number  | LOR    | Unit  |                             | Spike                                 | Spike Recovery (%) | Acceptable Limits (%) |      |
|                                                                         |             |        |       |                             | Concentration                         | LCS                | Low                   | High |
|                                                                         |             |        |       |                             |                                       |                    |                       |      |
|                                                                         |             |        |       |                             |                                       |                    |                       |      |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4052758) - continued |             |        |       |                             |                                       |                    |                       |      |
| EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)                     | 120226-60-0 | 0.0005 | mg/kg | <0.0005                     | 0.00125 mg/kg                         | 101                | 69.2                  | 143  |

## 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                                         |           |                                                                   |            | 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: 4052758)   |           |                                                                   |            |                          |                  |                       |      |
| EP2114396-008                                            | Anonymous | EP231X: Perfluorobutane sulfonic acid (PFBS)                      | 375-73-5   | 0.00125 mg/kg            | 91.6             | 72.0                  | 128  |
|                                                          |           | EP231X: Perfluoropentane sulfonic acid (PFPeS)                    | 2706-91-4  | 0.00125 mg/kg            | 107              | 73.0                  | 123  |
|                                                          |           | EP231X: Perfluorohexane sulfonic acid (PFHxS)                     | 355-46-4   | 0.00125 mg/kg            | 108              | 67.0                  | 130  |
|                                                          |           | EP231X: Perfluoroheptane sulfonic acid (PFHpS)                    | 375-92-8   | 0.00125 mg/kg            | 102              | 70.0                  | 132  |
|                                                          |           | EP231X: Perfluorooctane sulfonic acid (PFOS)                      | 1763-23-1  | 0.00125 mg/kg            | 102              | 68.0                  | 136  |
|                                                          |           | EP231X: Perfluorodecane sulfonic acid (PFDS)                      | 335-77-3   | 0.00125 mg/kg            | 103              | 59.0                  | 134  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4052758) |           |                                                                   |            |                          |                  |                       |      |
| EP2114396-008                                            | Anonymous | 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            | 119              | 69.0                  | 132  |
|                                                          |           | EP231X: Perfluorohexanoic acid (PFHxA)                            | 307-24-4   | 0.00125 mg/kg            | 118              | 70.0                  | 132  |
|                                                          |           | EP231X: Perfluoroheptanoic acid (PFHpA)                           | 375-85-9   | 0.00125 mg/kg            | 113              | 71.0                  | 131  |
|                                                          |           | EP231X: Perfluorooctanoic acid (PFOA)                             | 335-67-1   | 0.00125 mg/kg            | 114              | 69.0                  | 133  |
|                                                          |           | EP231X: Perfluorononanoic acid (PFNA)                             | 375-95-1   | 0.00125 mg/kg            | 106              | 72.0                  | 129  |
|                                                          |           | EP231X: Perfluorodecanoic acid (PFDA)                             | 335-76-2   | 0.00125 mg/kg            | 104              | 69.0                  | 133  |
|                                                          |           | EP231X: Perfluoroundecanoic acid (PFUnDA)                         | 2058-94-8  | 0.00125 mg/kg            | 96.8             | 64.0                  | 136  |
|                                                          |           | EP231X: Perfluorododecanoic acid (PFDoDA)                         | 307-55-1   | 0.00125 mg/kg            | 111              | 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            | 121              | 69.0                  | 133  |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4052758)     |           |                                                                   |            |                          |                  |                       |      |
| EP2114396-008                                            | Anonymous | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6   | 0.00125 mg/kg            | 107              | 67.0                  | 137  |
|                                                          |           | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8 | 0.00312 mg/kg            | 122              | 71.6                  | 129  |
|                                                          |           | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2  | 0.00312 mg/kg            | 106              | 69.8                  | 131  |
|                                                          |           | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7 | 0.00312 mg/kg            | 113              | 68.7                  | 130  |
|                                                          |           | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2  | 0.00312 mg/kg            | 118              | 65.1                  | 134  |
|                                                          |           | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9  | 0.00125 mg/kg            | 107              | 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: 4052758) - continued |           |                                                                  |             |                          |                  |                       |      |
| EP2114396-008                                                    | Anonymous | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA) | 2991-50-6   | 0.00125 mg/kg            | 100              | 61.0                  | 139  |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4052758)      |           |                                                                  |             |                          |                  |                       |      |
| EP2114396-008                                                    | Anonymous | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                | 757124-72-4 | 0.00125 mg/kg            | 119              | 62.0                  | 145  |
|                                                                  |           | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                | 27619-97-2  | 0.00125 mg/kg            | 129              | 64.0                  | 140  |
|                                                                  |           | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                | 39108-34-4  | 0.00125 mg/kg            | 126              | 65.0                  | 137  |
|                                                                  |           | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)              | 120226-60-0 | 0.00125 mg/kg            | 84.8             | 69.2                  | 143  |

## QA/QC Compliance Assessment to assist with Quality Review

|              |                       |                         |                                |
|--------------|-----------------------|-------------------------|--------------------------------|
| Work Order   | : EP2114397           | Page                    | : 1 of 4                       |
| Client       | : CARDNO (WA) PTY LTD | Laboratory              | : Environmental Division Perth |
| Contact      | : [REDACTED]          | Telephone               | : +61-8-9406 1301              |
| Project      | : WA_0960_PFASOMP     | Date Samples Received   | : 26-Nov-2021                  |
| Site         | : DEF19009/Learmonth  | Issue Date              | : 08-Dec-2021                  |
| Sampler      | : [REDACTED]          | No. of samples received | : 4                            |
| Order number | : DEF19009/0960       | 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                                                             | Sample Date                             | Extraction / Preparation |                    |             | Analysis      |                  |             |   |
|--------------------------------------------------------------------|-----------------------------------------|--------------------------|--------------------|-------------|---------------|------------------|-------------|---|
| Container / Client Sample ID(s)                                    |                                         | Date extracted           | Due for extraction | Evaluation  | Date analysed | Due for analysis | Evaluation  |   |
| EA055: Moisture Content (Dried @ 105-110°C)                        |                                         |                          |                    |             |               |                  |             |   |
| HDPE Soil Jar (EA055)<br>0960_SS123_211124,<br>0960_SS121_211124,  | 0960_QC122_211124,<br>0960_SS122_211124 | 24-Nov-2021              | ----               | ----        | ----          | 06-Dec-2021      | 08-Dec-2021 | ✓ |
| EP231A: Perfluoroalkyl Sulfonic Acids                              |                                         |                          |                    |             |               |                  |             |   |
| HDPE Soil Jar (EP231X)<br>0960_SS123_211124,<br>0960_SS121_211124, | 0960_QC122_211124,<br>0960_SS122_211124 | 24-Nov-2021              | 03-Dec-2021        | 23-May-2022 | ✓             | 07-Dec-2021      | 12-Jan-2022 | ✓ |
| EP231B: Perfluoroalkyl Carboxylic Acids                            |                                         |                          |                    |             |               |                  |             |   |
| HDPE Soil Jar (EP231X)<br>0960_SS123_211124,<br>0960_SS121_211124, | 0960_QC122_211124,<br>0960_SS122_211124 | 24-Nov-2021              | 03-Dec-2021        | 23-May-2022 | ✓             | 07-Dec-2021      | 12-Jan-2022 | ✓ |
| EP231C: Perfluoroalkyl Sulfonamides                                |                                         |                          |                    |             |               |                  |             |   |
| HDPE Soil Jar (EP231X)<br>0960_SS123_211124,<br>0960_SS121_211124, | 0960_QC122_211124,<br>0960_SS122_211124 | 24-Nov-2021              | 03-Dec-2021        | 23-May-2022 | ✓             | 07-Dec-2021      | 12-Jan-2022 | ✓ |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids                         |                                         |                          |                    |             |               |                  |             |   |
| HDPE Soil Jar (EP231X)<br>0960_SS123_211124,<br>0960_SS121_211124, | 0960_QC122_211124,<br>0960_SS122_211124 | 24-Nov-2021              | 03-Dec-2021        | 23-May-2022 | ✓             | 07-Dec-2021      | 12-Jan-2022 | ✓ |
| EP231P: PFAS Sums                                                  |                                         |                          |                    |             |               |                  |             |   |
| HDPE Soil Jar (EP231X)<br>0960_SS123_211124,<br>0960_SS121_211124, | 0960_QC122_211124,<br>0960_SS122_211124 | 24-Nov-2021              | 03-Dec-2021        | 23-May-2022 | ✓             | 07-Dec-2021      | 12-Jan-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                          |        | Count |         | Rate (%) |          |            | Quality Control Specification  |
|------------------------------------------------------|--------|-------|---------|----------|----------|------------|--------------------------------|
| Analytical Methods                                   | Method | QC    | Regular | Actual   | Expected | Evaluation |                                |
| Laboratory Duplicates (DUP)                          |        |       |         |          |          |            |                                |
| Moisture Content                                     | EA055  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 2     | 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. |
| Preparation Methods                                  | Method | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| QuEChERS Extraction of Solids                        | ORG71  | SOIL   | In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.                                                                                                                                                                                                                                   |

**CHAIN OF CUSTODY**

ALS COC#: 30635 ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: MB\_DEF19009/Learmonth SW

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:

/ ES2019CARBSD0002

**LABORATORY USE ONLY (Circle)**

Custody Seal intact?

Yes 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 | Surface Waters Primary WATER | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|------------|-------------|------------------------|--------|----------------------|---------|------------------------------|----------------------|------------------------|
| 001    | 0960_SW305 |             | 24/11/2021<br>12:10 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial<br>4/8               |                      |                        |
| 002    | 0960_QC123 |             | 24/11/2021<br>12:12 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial<br>1/8               |                      |                        |
| 003    | 0960_SW304 |             | 24/11/2021<br>12:25 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial<br>4/8               |                      |                        |
| 004    | 0960_SW001 |             | 24/11/2021<br>01:00 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial<br>4/8               |                      |                        |
| 005    | 0960_SW300 |             | 24/11/2021<br>01:35 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial<br>4/8               |                      |                        |
| 006    | 0960_QC126 |             | 24/11/2021<br>01:36 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial<br>1/8               |                      |                        |
| 007    | 0960_SW211 |             | 24/11/2021<br>02:29 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial<br>4/8               |                      |                        |



# CHAIN OF CUSTODY

COC#: 30635 ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: MB\_DEF19009/Learmonth SW

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:  
/ ES2019CARBSD0002

## LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes 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    | 0960_SW305  | Surface Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 002    | 0960_QC123  | Surface Waters Primary WATER | Water  | - EP231X PFAS - Full Suite (28 analytes)                                                                                                                                                                    |
| 003    | 0960_SW304  | Surface Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 004    | 0960_SW001  | Surface Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 005    | 0960_SW300  | Surface Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 006    | 0960_QC126  | Surface Waters Primary WATER | Water  | - EP231X PFAS - Full Suite (28 analytes)                                                                                                                                                                    |
| 007    | 0960_SW211  | Surface Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |

**CHAIN OF CUSTODY**

ALS COC#: 30635

ALS Laboratory: EP Perth

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: MB\_DEF19009/Learmonth SW

ORDER NO: DEF19009/0960

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS: 5 Days

Biohazard info:

SAMPLER MOBILE:  
/ ES2019CARBSD0002**LABORATORY USE ONLY (Circle)**

Custody Seal intact?

Yes 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                                     | 0960_SW305  | Clear Plastic Bottle - Natural | 250 mL | 00070621070470 | Green | No       |        |
| 001                                     | 0960_SW305  | HDPE (no PTFE)                 | 20 mL  | 00352101071471 | Grey  | No       |        |
| 001                                     | 0960_SW305  | HDPE (no PTFE)                 | 20 mL  | 00352101071833 | Grey  | No       |        |
| 002                                     | 0960_QC123  | HDPE (no PTFE)                 | 20 mL  | 00352101071737 | Grey  | No       |        |
| 002                                     | 0960_QC123  | HDPE (no PTFE)                 | 20 mL  | 00352101070956 | Grey  | No       |        |
| 002                                     | 0960_QC123  | Clear Plastic Bottle - Natural | 250 mL | 00070621191133 | Green | No       |        |
| 003                                     | 0960_SW304  | Clear Plastic Bottle - Natural | 250 mL | 00070621191148 | Green | No       |        |
| 003                                     | 0960_SW304  | HDPE (no PTFE)                 | 20 mL  | 00352101071855 | Grey  | No       |        |
| 003                                     | 0960_SW304  | HDPE (no PTFE)                 | 20 mL  | 00352101071723 | Grey  | No       |        |
| 004                                     | 0960_SW001  | Clear Plastic Bottle - Natural | 250 mL | 00070621197273 | Green | No       |        |
| 004                                     | 0960_SW001  | HDPE (no PTFE)                 | 20 mL  | 00352101071247 | Grey  | No       |        |
| 004                                     | 0960_SW001  | HDPE (no PTFE)                 | 20 mL  | 00352101070750 | Grey  | No       |        |
| 005                                     | 0960_SW300  | Clear Plastic Bottle - Natural | 250 mL | 00070621191277 | Green | No       |        |
| 005                                     | 0960_SW300  | HDPE (no PTFE)                 | 20 mL  | 00352101071816 | Grey  | No       |        |
| 005                                     | 0960_SW300  | HDPE (no PTFE)                 | 20 mL  | 00352101071516 | Grey  | No       |        |
| 006                                     | 0960_QC126  | HDPE (no PTFE)                 | 20 mL  | 00352101071884 | Grey  | No       |        |
| 006                                     | 0960_QC126  | Clear Plastic Bottle - Natural | 250 mL | 00070621191257 | Green | No       |        |
| 006                                     | 0960_QC126  | HDPE (no PTFE)                 | 20 mL  | 00352101071952 | Grey  | No       |        |
| 007                                     | 0960_SW211  | Clear Plastic Bottle - Natural | 250 mL | 00070621197282 | Green | No       |        |
| 007                                     | 0960_SW211  | HDPE (no PTFE)                 | 20 mL  | 00352101071772 | Grey  | No       |        |
| 007                                     | 0960_SW211  | HDPE (no PTFE)                 | 20 mL  | 00352101071005 | Grey  | No       |        |
| Total Bottle Count: ALS: 21, Non ALS: 0 |             |                                |        |                |       |          |        |

## SAMPLE RECEIPT NOTIFICATION (SRN)

**Work Order : EP2114398**

|                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Client : <b>CARDNO (WA) PTY LTD</b></p> <p>Contact : [REDACTED]</p> <p>Address : 11 HARVEST TERRACE PO BOX 155<br/>WEST PERTH WA, AUSTRALIA 6006</p> <p>E-mail : [REDACTED]@cardno.com.au</p> <p>Telephone : ----</p> <p>Facsimile : ----</p> <p>Project : WA_0960_PFASOMP</p> <p>Order number : DEF19009/0960</p> <p>C-O-C number : 30635</p> <p>Site : DEF19009/Learmonth</p> <p>Sampler : [REDACTED]</p> | <p>Laboratory : Environmental Division Perth</p> <p>Contact : [REDACTED]</p> <p>Address : 26 Rigali Way Wangara WA Australia<br/>6065</p> <p>E-mail : [REDACTED]@alsglobal.com</p> <p>Telephone : +61-8-9406 1301</p> <p>Facsimile : +61-8-9406 1399</p> <p>Page : 1 of 2</p> <p>Quote number : ES2019CARBSD0002 (SY/139/19)</p> <p>QC Level : NEPM 2013 B3 &amp; ALS QC Standard</p> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Dates

|                                           |                                               |
|-------------------------------------------|-----------------------------------------------|
| Date Samples Received : 26-Nov-2021 09:55 | Issue Date : 26-Nov-2021                      |
| Client Requested Due Date : 07-Dec-2021   | Scheduled Reporting Date : <b>07-Dec-2021</b> |

### Delivery Details

|                             |                                            |
|-----------------------------|--------------------------------------------|
| Mode of Delivery : Carrier  | Security Seal : Not Available              |
| No. of coolers/boxes : 3    | Temperature : 24.8 - Ice present           |
| Receipt Detail : Ice Melted | 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
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepancies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **PFAS analysis will be conducted by ALS Environmental, Sydney, NATA accreditation no. 825, Site No. 10911.**
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.





## Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exists.

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

| Laboratory sample ID | Sampling date / time | Sample ID         | WATER - EN055 - PG<br>Ionic Balance by ED037P, ED041G, ED045G &<br>ED045H | WATER - EP231X<br>PFAS - Full Suite (28 analytes) | WATER - NT-01<br>Major Cations (Ca, Mg, Na, K) | WATER - NT-02<br>Major Anions (Chloride, Sulphate, Alkalinity) |
|----------------------|----------------------|-------------------|---------------------------------------------------------------------------|---------------------------------------------------|------------------------------------------------|----------------------------------------------------------------|
| EP2114398-001        | 24-Nov-2021 12:10    | 0960_SW305_211124 | ✓                                                                         | ✓                                                 | ✓                                              | ✓                                                              |
| EP2114398-002        | 24-Nov-2021 12:12    | 0960_QC123_211124 |                                                                           | ✓                                                 |                                                |                                                                |
| EP2114398-003        | 24-Nov-2021 12:25    | 0960_SW304_211124 | ✓                                                                         | ✓                                                 | ✓                                              | ✓                                                              |
| EP2114398-004        | 24-Nov-2021 13:00    | 0960_SW001_211124 | ✓                                                                         | ✓                                                 | ✓                                              | ✓                                                              |
| EP2114398-005        | 24-Nov-2021 13:35    | 0960_SW300_211124 | ✓                                                                         | ✓                                                 | ✓                                              | ✓                                                              |
| EP2114398-006        | 24-Nov-2021 13:36    | 0960_QC126_211124 |                                                                           | ✓                                                 |                                                |                                                                |
| EP2114398-007        | 24-Nov-2021 14:29    | 0960_SW211_211124 | ✓                                                                         | ✓                                                 | ✓                                              | ✓                                                              |

## Proactive Holding Time Report

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

## Requested Deliverables

|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----------------------------------------|
| <div> <div></div> <div></div> </div> <ul style="list-style-type: none"> <li>- A4 - AU Tax Invoice (INV)</li> </ul>                                                                                                                                                                                                                                                                                                                                            | Email | <div>cardno.com.au</div>                |
| <b>DERP LAB REPORTS</b>                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |                                         |
| <ul style="list-style-type: none"> <li>- EDI Format - ESDAT (ESDAT)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                | Email | <div>derp.labreports@esdat.com.au</div> |
| <div> <div></div> <div></div> </div> <ul style="list-style-type: none"> <li>- *AU Certificate of Analysis - NATA (COA)</li> <li>- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)</li> <li>- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)</li> <li>- A4 - AU Sample Receipt Notification - Environmental HT (SRN)</li> <li>- Chain of Custody (CoC) (COC)</li> <li>- EDI Format - ESDAT (ESDAT)</li> <li>- EDI Format - XTab (XTAB)</li> </ul> | Email | <div>cardno.com.au</div>                |
| <b>Perth</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |                                         |
| <ul style="list-style-type: none"> <li>- A4 - AU Tax Invoice (INV)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                 | Email | <div>perth@cardno.com.au</div>          |

## CERTIFICATE OF ANALYSIS

**Work Order** : **EP2114398**  
**Client** : **CARDNO (WA) PTY LTD**  
**Contact** : [REDACTED]  
**Address** : 11 HARVEST TERRACE PO BOX 155  
 WEST PERTH WA, AUSTRALIA 6006  
**Telephone** : ----  
**Project** : WA\_0960\_PFASOMP  
**Order number** : DEF19009/0960  
**C-O-C number** : 30635  
**Sampler** : [REDACTED]  
**Site** : DEF19009/Learmonth  
**Quote number** : SY/139/19  
**No. of samples received** : 7  
**No. of samples analysed** : 7

**Page** : 1 of 9  
**Laboratory** : Environmental Division Perth  
**Contact** : [REDACTED]  
**Address** : 26 Rigali Way Wangara WA Australia 6065  
**Telephone** : +61-8-9406 1301  
**Date Samples Received** : 26-Nov-2021 09:55  
**Date Analysis Commenced** : 01-Dec-2021  
**Issue Date** : 07-Dec-2021 11:03



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>    |
|------------------------------------------------------------------------|----------------------------|----------------------------------|
| <span style="background-color: black; color: black;">[REDACTED]</span> | Laboratory Manager (Perth) | Perth Inorganics, Wangara, WA    |
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator           | Sydney Organics, Smithfield, NSW |



## 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.

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



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                        |             |      |       | 0960_SW305_211124 | 0960_QC123_211124 | 0960_SW304_211124 | 0960_SW001_211124 | 0960_SW300_211124 |
|--------------------------------------------------------|-------------|------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                   |             |      |       | 24-Nov-2021 12:10 | 24-Nov-2021 12:12 | 24-Nov-2021 12:25 | 24-Nov-2021 13:00 | 24-Nov-2021 13:35 |
| Compound                                               | CAS Number  | LOR  | Unit  | EP2114398-001     | EP2114398-002     | EP2114398-003     | EP2114398-004     | EP2114398-005     |
|                                                        |             |      |       | Result            | Result            | Result            | Result            | Result            |
| <b>ED037P: Alkalinity by PC Titrator</b>               |             |      |       |                   |                   |                   |                   |                   |
| Hydroxide Alkalinity as CaCO3                          | DMO-210-001 | 1    | mg/L  | <1                | ----              | <1                | <1                | <1                |
| Carbonate Alkalinity as CaCO3                          | 3812-32-6   | 1    | mg/L  | <1                | ----              | <1                | <1                | <1                |
| Bicarbonate Alkalinity as CaCO3                        | 71-52-3     | 1    | mg/L  | 203               | ----              | 252               | 188               | 248               |
| Total Alkalinity as CaCO3                              | ----        | 1    | mg/L  | 203               | ----              | 252               | 188               | 248               |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b> |             |      |       |                   |                   |                   |                   |                   |
| Sulfate as SO4 - Turbidimetric                         | 14808-79-8  | 1    | mg/L  | 3020              | ----              | 3340              | 3930              | 5150              |
| <b>ED045G: Chloride by Discrete Analyser</b>           |             |      |       |                   |                   |                   |                   |                   |
| Chloride                                               | 16887-00-6  | 1    | mg/L  | 22200             | ----              | 24000             | 27200             | 36800             |
| <b>ED093F: Dissolved Major Cations</b>                 |             |      |       |                   |                   |                   |                   |                   |
| Calcium                                                | 7440-70-2   | 1    | mg/L  | 573               | ----              | 629               | 676               | 872               |
| Magnesium                                              | 7439-95-4   | 1    | mg/L  | 1760              | ----              | 1870              | 2200              | 2880              |
| Sodium                                                 | 7440-23-5   | 1    | mg/L  | 13900             | ----              | 15000             | 17500             | 22900             |
| Potassium                                              | 7440-09-7   | 1    | mg/L  | 701               | ----              | 760               | 917               | 1010              |
| <b>EN055: Ionic Balance</b>                            |             |      |       |                   |                   |                   |                   |                   |
| ∅ Total Anions                                         | ----        | 0.01 | meq/L | 693               | ----              | 752               | 853               | 1150              |
| ∅ Total Cations                                        | ----        | 0.01 | meq/L | 796               | ----              | 857               | 999               | 1300              |
| ∅ Ionic Balance                                        | ----        | 0.01 | %     | 6.90              | ----              | 6.56              | 7.91              | 6.20              |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>           |             |      |       |                   |                   |                   |                   |                   |
| 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             |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>         |             |      |       |                   |                   |                   |                   |                   |
| 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             |



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_SW305_211124 | 0960_QC123_211124 | 0960_SW304_211124 | 0960_SW001_211124 | 0960_SW300_211124 |
|------------------------------------------------------------|-------------|------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                       |             |      |      | 24-Nov-2021 12:10 | 24-Nov-2021 12:12 | 24-Nov-2021 12:25 | 24-Nov-2021 13:00 | 24-Nov-2021 13:35 |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2114398-001     | EP2114398-002     | EP2114398-003     | EP2114398-004     | EP2114398-005     |
|                                                            |             |      |      | Result            | Result            | Result            | Result            | Result            |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                   |                   |                   |                   |                   |
| 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             |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                   |                   |                   |                   |                   |
| Perfluorooctane sulfonamide (FOSA)                         | 754-91-6    | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)              | 31506-32-8  | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)               | 4151-50-2   | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)       | 24448-09-7  | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)        | 1691-99-2   | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)  | 2355-31-9   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)   | 2991-50-6   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                   |                   |                   |                   |                   |
| 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             |





## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_SW305_211124 | 0960_QC123_211124 | 0960_SW304_211124 | 0960_SW001_211124 | 0960_SW300_211124 |
|---------------------------------------------------------------|--------------------|------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                          |                    |      |      | 24-Nov-2021 12:10 | 24-Nov-2021 12:12 | 24-Nov-2021 12:25 | 24-Nov-2021 13:00 | 24-Nov-2021 13:35 |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2114398-001     | EP2114398-002     | EP2114398-003     | EP2114398-004     | EP2114398-005     |
|                                                               |                    |      |      | Result            | Result            | Result            | Result            | Result            |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                   |                   |                   |                   |                   |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                   |                   |                   |                   |                   |
| 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             |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 110               | 116               | 112               | 106               | 112               |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 104               | 104               | 109               | 108               | 107               |



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                        |             |      |       | 0960_QC126_211124 | 0960_SW211_211124 | ----  | ----  | ----  |
|--------------------------------------------------------|-------------|------|-------|-------------------|-------------------|-------|-------|-------|
| Sampling date / time                                   |             |      |       | 24-Nov-2021 13:36 | 24-Nov-2021 14:29 | ----  | ----  | ----  |
| Compound                                               | CAS Number  | LOR  | Unit  | EP2114398-006     | EP2114398-007     | ----- | ----- | ----- |
|                                                        |             |      |       | Result            | Result            | ----  | ----  | ----  |
| <b>ED037P: Alkalinity by PC Titrator</b>               |             |      |       |                   |                   |       |       |       |
| Hydroxide Alkalinity as CaCO3                          | DMO-210-001 | 1    | mg/L  | ----              | <1                | ----  | ----  | ----  |
| Carbonate Alkalinity as CaCO3                          | 3812-32-6   | 1    | mg/L  | ----              | <1                | ----  | ----  | ----  |
| Bicarbonate Alkalinity as CaCO3                        | 71-52-3     | 1    | mg/L  | ----              | 222               | ----  | ----  | ----  |
| Total Alkalinity as CaCO3                              | ----        | 1    | mg/L  | ----              | 222               | ----  | ----  | ----  |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b> |             |      |       |                   |                   |       |       |       |
| Sulfate as SO4 - Turbidimetric                         | 14808-79-8  | 1    | mg/L  | ----              | 5040              | ----  | ----  | ----  |
| <b>ED045G: Chloride by Discrete Analyser</b>           |             |      |       |                   |                   |       |       |       |
| Chloride                                               | 16887-00-6  | 1    | mg/L  | ----              | 36600             | ----  | ----  | ----  |
| <b>ED093F: Dissolved Major Cations</b>                 |             |      |       |                   |                   |       |       |       |
| Calcium                                                | 7440-70-2   | 1    | mg/L  | ----              | 886               | ----  | ----  | ----  |
| Magnesium                                              | 7439-95-4   | 1    | mg/L  | ----              | 2910              | ----  | ----  | ----  |
| Sodium                                                 | 7440-23-5   | 1    | mg/L  | ----              | 23300             | ----  | ----  | ----  |
| Potassium                                              | 7440-09-7   | 1    | mg/L  | ----              | 1030              | ----  | ----  | ----  |
| <b>EN055: Ionic Balance</b>                            |             |      |       |                   |                   |       |       |       |
| ∅ Total Anions                                         | ----        | 0.01 | meq/L | ----              | 1140              | ----  | ----  | ----  |
| ∅ Total Cations                                        | ----        | 0.01 | meq/L | ----              | 1320              | ----  | ----  | ----  |
| ∅ Ionic Balance                                        | ----        | 0.01 | %     | ----              | 7.37              | ----  | ----  | ----  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>           |             |      |       |                   |                   |       |       |       |
| 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             | ----  | ----  | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>         |             |      |       |                   |                   |       |       |       |
| 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             | ----  | ----  | ----  |



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_QC126_211124 | 0960_SW211_211124 | ----  | ----  | ----  |
|------------------------------------------------------------|-------------|------|------|-------------------|-------------------|-------|-------|-------|
| Sampling date / time                                       |             |      |      | 24-Nov-2021 13:36 | 24-Nov-2021 14:29 | ----  | ----  | ----  |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2114398-006     | EP2114398-007     | ----- | ----- | ----- |
| Result                                                     |             |      |      | Result            | Result            | ----  | ----  | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                   |                   |       |       |       |
| 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             | ----  | ----  | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                   |                   |       |       |       |
| 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             | ----  | ----  | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                   |                   |       |       |       |
| 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             | ----  | ----  | ----  |



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_QC126_211124 | 0960_SW211_211124 | ----  | ----  | ----  |
|---------------------------------------------------------------|--------------------|------|------|-------------------|-------------------|-------|-------|-------|
| Sampling date / time                                          |                    |      |      | 24-Nov-2021 13:36 | 24-Nov-2021 14:29 | ----  | ----  | ----  |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2114398-006     | EP2114398-007     | ----- | ----- | ----- |
|                                                               |                    |      |      | Result            | Result            | ----  | ----  | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                   |                   |       |       |       |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05             | <0.05             | ----  | ----  | ----  |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                   |                   |       |       |       |
| 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             | ----  | ----  | ----  |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                   |                   |       |       |       |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 115               | 113               | ----  | ----  | ----  |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 106               | 106               | ----  | ----  | ----  |



## Surrogate Control Limits

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

## Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (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              | : EP2114398                                                      | Page                    | : 1 of 8                                  |
| Client                  | : CARDNO (WA) PTY LTD                                            | Laboratory              | : Environmental Division Perth            |
| Contact                 | : [REDACTED]                                                     | Contact                 | : [REDACTED]                              |
| Address                 | : 11 HARVEST TERRACE PO BOX 155<br>WEST PERTH WA, AUSTRALIA 6006 | Address                 | : 26 Rigali Way Wangara WA Australia 6065 |
| Telephone               | : ----                                                           | Telephone               | : +61-8-9406 1301                         |
| Project                 | : WA_0960_PFASOMP                                                | Date Samples Received   | : 26-Nov-2021                             |
| Order number            | : DEF19009/0960                                                  | Date Analysis Commenced | : 01-Dec-2021                             |
| C-O-C number            | : 30635                                                          | Issue Date              | : 07-Dec-2021                             |
| Sampler                 | : [REDACTED]                                                     |                         |                                           |
| Site                    | : DEF19009/Learmonth                                             |                         |                                           |
| Quote number            | : SY/139/19                                                      |                         |                                           |
| No. of samples received | : 7                                                              |                         |                                           |
| No. of samples analysed | : 7                                                              |                         |                                           |



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

This Quality Control Report contains the following information:

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

### Signatories

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

| Signatories | Position                   | Accreditation Category           |
|-------------|----------------------------|----------------------------------|
| [REDACTED]  | Laboratory Manager (Perth) | Perth Inorganics, Wangara, WA    |
| [REDACTED]  | LCMS Coordinator           | Sydney Organics, Smithfield, NSW |



## 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**

| Sub-Matrix: WATER                                                 |                   |                                          |             | Laboratory Duplicate (DUP) Report |      |                 |                  |         |                    |
|-------------------------------------------------------------------|-------------------|------------------------------------------|-------------|-----------------------------------|------|-----------------|------------------|---------|--------------------|
| Laboratory sample ID                                              | Sample ID         | Method: Compound                         | CAS Number  | LOR                               | Unit | Original Result | Duplicate Result | RPD (%) | Acceptable RPD (%) |
| ED037P: Alkalinity by PC Titrator (QC Lot: 4053985)               |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2114398-003                                                     | 0960_SW304_211124 | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 252             | 252              | 0.0     | 0% - 20%           |
|                                                                   |                   | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 252             | 252              | 0.0     | 0% - 20%           |
| EP2114468-008                                                     | Anonymous         | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 402             | 394              | 2.0     | 0% - 20%           |
|                                                                   |                   | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 402             | 394              | 2.0     | 0% - 20%           |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4040534) |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2114300-001                                                     | Anonymous         | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 1650            | 1660             | 0.2     | 0% - 20%           |
| EP2114301-003                                                     | Anonymous         | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 2530            | 2540             | 0.5     | 0% - 20%           |
| ED045G: Chloride by Discrete Analyser (QC Lot: 4040533)           |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2114300-001                                                     | Anonymous         | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 12800           | 12800            | 0.2     | 0% - 20%           |
| EP2114301-003                                                     | Anonymous         | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 18700           | 18600            | 0.1     | 0% - 20%           |
| ED093F: Dissolved Major Cations (QC Lot: 4042970)                 |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2114394-001                                                     | Anonymous         | ED093F: Calcium                          | 7440-70-2   | 1                                 | mg/L | 1080            | 1090             | 0.6     | 0% - 20%           |
|                                                                   |                   | ED093F: Magnesium                        | 7439-95-4   | 1                                 | mg/L | 2780            | 2810             | 1.2     | 0% - 20%           |
|                                                                   |                   | ED093F: Sodium                           | 7440-23-5   | 1                                 | mg/L | 23000           | 23300            | 1.7     | 0% - 20%           |
|                                                                   |                   | ED093F: Potassium                        | 7440-09-7   | 1                                 | mg/L | 1180            | 1200             | 1.4     | 0% - 20%           |
| EP2114395-006                                                     | Anonymous         | ED093F: Calcium                          | 7440-70-2   | 1                                 | mg/L | 210             | 209              | 0.0     | 0% - 20%           |
|                                                                   |                   | ED093F: Magnesium                        | 7439-95-4   | 1                                 | mg/L | 178             | 177              | 0.0     | 0% - 20%           |
|                                                                   |                   | ED093F: Sodium                           | 7440-23-5   | 1                                 | mg/L | 1710            | 1700             | 0.4     | 0% - 20%           |
|                                                                   |                   | ED093F: Potassium                        | 7440-09-7   | 1                                 | mg/L | 66              | 65               | 0.0     | 0% - 20%           |



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 (%) |
| ED093F: Dissolved Major Cations (QC Lot: 4042971)         |                   |                                                |            |                                   |      |                 |                  |         |                    |
| EP2114398-007                                             | 0960_SW211_211124 | ED093F: Calcium                                | 7440-70-2  | 1                                 | mg/L | 886             | 886              | 0.0     | 0% - 20%           |
|                                                           |                   | ED093F: Magnesium                              | 7439-95-4  | 1                                 | mg/L | 2910            | 2930             | 0.6     | 0% - 20%           |
|                                                           |                   | ED093F: Sodium                                 | 7440-23-5  | 1                                 | mg/L | 23300           | 23400            | 0.4     | 0% - 20%           |
|                                                           |                   | ED093F: Potassium                              | 7440-09-7  | 1                                 | mg/L | 1030            | 1040             | 0.9     | 0% - 20%           |
| EP2114511-001                                             | Anonymous         | ED093F: Calcium                                | 7440-70-2  | 1                                 | mg/L | 86              | 85               | 0.0     | 0% - 20%           |
|                                                           |                   | ED093F: Magnesium                              | 7439-95-4  | 1                                 | mg/L | 49              | 49               | 0.0     | 0% - 20%           |
|                                                           |                   | ED093F: Sodium                                 | 7440-23-5  | 1                                 | mg/L | 102             | 102              | 0.0     | 0% - 20%           |
|                                                           |                   | ED093F: Potassium                              | 7440-09-7  | 1                                 | mg/L | 6               | 6                | 0.0     | No Limit           |
| EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4051169)   |                   |                                                |            |                                   |      |                 |                  |         |                    |
| EP2114394-005                                             | Anonymous         | EP231X: Perfluorohexane sulfonic acid (PFHxS)  | 355-46-4   | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
|                                                           |                   | EP231X: Perfluorooctane sulfonic acid (PFOS)   | 1763-23-1  | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
|                                                           |                   | EP231X: Perfluorobutane sulfonic acid (PFBS)   | 375-73-5   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |                   | EP231X: Perfluoropentane sulfonic acid (PFPeS) | 2706-91-4  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |                   | EP231X: Perfluoroheptane sulfonic acid (PFHpS) | 375-92-8   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |                   | EP231X: Perfluorodecane sulfonic acid (PFDS)   | 335-77-3   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
| EP2114394-008                                             | 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: 4051169) |                   |                                                |            |                                   |      |                 |                  |         |                    |
| EP2114394-005                                             | 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 (PFTeDA)     | 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           |
| EP2114394-008                                             | Anonymous         | EP231X: Perfluorooctanoic acid (PFOA)          | 335-67-1   | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
|                                                           |                   | EP231X: Perfluoropentanoic acid (PFPeA)        | 2706-90-3  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |                   | EP231X: Perfluorohexanoic acid (PFHxA)         | 307-24-4   | 0.02                              | µg/L | <0.02           | <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**

| Sub-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: 4051169) - continued |           |                                                                   |             |                                   |      |                 |                  |         |                    |
| EP2114394-008                                                         | Anonymous | EP231X: Perfluorododecanoic acid (PFDoDA)                         | 307-55-1    | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |           | EP231X: Perfluorotridecanoic acid (PFTrDA)                        | 72629-94-8  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |           | EP231X: Perfluorotetradecanoic acid (PFTeDA)                      | 376-06-7    | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                       |           | EP231X: Perfluorobutanoic acid (PFBA)                             | 375-22-4    | 0.1                               | µg/L | <0.1            | <0.1             | 0.0     | No Limit           |
| EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4051169)                 |           |                                                                   |             |                                   |      |                 |                  |         |                    |
| EP2114394-005                                                         | 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           |
| EP2114394-008                                                         | Anonymous | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |           | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |           | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |           | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                       |           | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                       |           | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                       |           | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4051169)          |           |                                                                   |             |                                   |      |                 |                  |         |                    |
| EP2114394-005                                                         | 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           |

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 Work Order : EP2114398  
 Client : CARDNO (WA) PTY LTD  
 Project : WA\_0960\_PFASOMP



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 (%) |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4051169) - continued |           |                                                     |             |                                   |      |                 |                  |         |                    |
| EP2114394-008                                                            | Anonymous | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)   | 757124-72-4 | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                          |           | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)   | 27619-97-2  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                          |           | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)   | 39108-34-4  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                          |           | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS) | 120226-60-0 | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
| EP231P: PFAS Sums (QC Lot: 4051169)                                      |           |                                                     |             |                                   |      |                 |                  |         |                    |
| EP2114394-005                                                            | Anonymous | EP231X: Sum of PFAS                                 | ----        | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
| EP2114394-008                                                            | Anonymous | EP231X: Sum of PFAS                                 | ----        | 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**

| Sub-Matrix: WATER                                                |                 |      |      | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |      |
|------------------------------------------------------------------|-----------------|------|------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|------|
|                                                                  |                 |      |      |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |      |
| Method: Compound                                                 | CAS Number      | LOR  | Unit | Result                      |                                       |                           |                                   |      |
| ED037P: Alkalinity by PC Titrator (QCLot: 4053985)               |                 |      |      |                             |                                       |                           |                                   |      |
| ED037-P: Hydroxide Alkalinity as CaCO3                           | DMO-210-00<br>1 | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Carbonate Alkalinity as CaCO3                           | 3812-32-6       | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Bicarbonate Alkalinity as CaCO3                         | 71-52-3         | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Total Alkalinity as CaCO3                               | ----            | 1    | mg/L | <1                          | 20 mg/L                               | 110                       | 81.2                              | 126  |
|                                                                  |                 |      |      | <1                          | 200 mg/L                              | 99.4                      | 90.0                              | 110  |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4040534) |                 |      |      |                             |                                       |                           |                                   |      |
| ED041G: Sulfate as SO4 - Turbidimetric                           | 14808-79-8      | 1    | mg/L | <1                          | 25 mg/L                               | 103                       | 87.7                              | 113  |
|                                                                  |                 |      |      | <1                          | 500 mg/L                              | 104                       | 87.7                              | 113  |
| ED045G: Chloride by Discrete Analyser (QCLot: 4040533)           |                 |      |      |                             |                                       |                           |                                   |      |
| ED045G: Chloride                                                 | 16887-00-6      | 1    | mg/L | <1                          | 10 mg/L                               | 102                       | 87.9                              | 114  |
|                                                                  |                 |      |      | <1                          | 1000 mg/L                             | 103                       | 87.9                              | 114  |
| ED093F: Dissolved Major Cations (QCLot: 4042970)                 |                 |      |      |                             |                                       |                           |                                   |      |
| ED093F: Calcium                                                  | 7440-70-2       | 1    | mg/L | <1                          | 50 mg/L                               | 98.3                      | 85.9                              | 113  |
| ED093F: Magnesium                                                | 7439-95-4       | 1    | mg/L | <1                          | 50 mg/L                               | 97.8                      | 88.0                              | 110  |
| ED093F: Sodium                                                   | 7440-23-5       | 1    | mg/L | <1                          | 50 mg/L                               | 104                       | 87.3                              | 118  |
| ED093F: Potassium                                                | 7440-09-7       | 1    | mg/L | <1                          | 50 mg/L                               | 91.9                      | 89.7                              | 108  |
| ED093F: Dissolved Major Cations (QCLot: 4042971)                 |                 |      |      |                             |                                       |                           |                                   |      |
| ED093F: Calcium                                                  | 7440-70-2       | 1    | mg/L | <1                          | 50 mg/L                               | 99.9                      | 85.9                              | 113  |
| ED093F: Magnesium                                                | 7439-95-4       | 1    | mg/L | <1                          | 50 mg/L                               | 98.8                      | 88.0                              | 110  |
| ED093F: Sodium                                                   | 7440-23-5       | 1    | mg/L | <1                          | 50 mg/L                               | 104                       | 87.3                              | 118  |
| ED093F: Potassium                                                | 7440-09-7       | 1    | mg/L | <1                          | 50 mg/L                               | 92.5                      | 89.7                              | 108  |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4051169)           |                 |      |      |                             |                                       |                           |                                   |      |
| EP231X: Perfluorobutane sulfonic acid (PFBS)                     | 375-73-5        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 112                       | 72.0                              | 130  |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)                   | 2706-91-4       | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 99.8                      | 71.0                              | 127  |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)                    | 355-46-4        | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 99.4                      | 68.0                              | 131  |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)                   | 375-92-8        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 103                       | 69.0                              | 134  |
| EP231X: Perfluorooctane sulfonic acid (PFOS)                     | 1763-23-1       | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 105                       | 65.0                              | 140  |
| EP231X: Perfluorodecane sulfonic acid (PFDS)                     | 335-77-3        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 91.4                      | 53.0                              | 142  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4051169)         |                 |      |      |                             |                                       |                           |                                   |      |
| EP231X: Perfluorobutanoic acid (PFBA)                            | 375-22-4        | 0.1  | µg/L | <0.1                        | 1.25 µg/L                             | 91.4                      | 73.0                              | 129  |
| EP231X: Perfluoropentanoic acid (PFPeA)                          | 2706-90-3       | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 105                       | 72.0                              | 129  |
| EP231X: Perfluorohexanoic acid (PFHxA)                           | 307-24-4        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 120                       | 72.0                              | 129  |
| EP231X: Perfluoroheptanoic acid (PFHpA)                          | 375-85-9        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 116                       | 72.0                              | 130  |



Sub-Matrix: **WATER**

| Sub-Matrix: WATER                                                    |             |      |      | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |     |
|----------------------------------------------------------------------|-------------|------|------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|-----|
|                                                                      |             |      |      |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |     |
| Method: Compound                                                     | CAS Number  | LOR  | Unit | Result                      |                                       |                           |                                   |     |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4051169) - continued |             |      |      |                             |                                       |                           |                                   |     |
| EP231X: Perfluorooctanoic acid (PFOA)                                | 335-67-1    | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 118                       | 71.0                              | 133 |
| EP231X: Perfluorononanoic acid (PFNA)                                | 375-95-1    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 103                       | 69.0                              | 130 |
| EP231X: Perfluorodecanoic acid (PFDA)                                | 335-76-2    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 116                       | 71.0                              | 129 |
| EP231X: Perfluoroundecanoic acid (PFUnDA)                            | 2058-94-8   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 112                       | 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                             | 101                       | 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: 4051169)                 |             |      |      |                             |                                       |                           |                                   |     |
| EP231X: Perfluorooctane sulfonamide (FOSA)                           | 754-91-6    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 105                       | 67.0                              | 137 |
| EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)                | 31506-32-8  | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 79.1                      | 68.0                              | 141 |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)                 | 4151-50-2   | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 86.4                      | 62.6                              | 147 |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)         | 24448-09-7  | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 99.7                      | 66.0                              | 145 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)          | 1691-99-2   | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 95.5                      | 57.6                              | 145 |
| EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)    | 2355-31-9   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 103                       | 65.0                              | 136 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)     | 2991-50-6   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 123                       | 61.0                              | 135 |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4051169)          |             |      |      |                             |                                       |                           |                                   |     |
| EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                    | 757124-72-4 | 0.05 | µg/L | <0.05                       | 0.25 µg/L                             | 106                       | 63.0                              | 143 |
| EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                    | 27619-97-2  | 0.05 | µg/L | <0.05                       | 0.25 µg/L                             | 114                       | 64.0                              | 140 |
| EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                    | 39108-34-4  | 0.05 | µg/L | <0.05                       | 0.25 µg/L                             | 100                       | 67.0                              | 138 |
| EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)                  | 120226-60-0 | 0.05 | µg/L | <0.05                       | 0.25 µg/L                             | 81.6                      | 71.4                              | 144 |

## Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

|                                                                         |           |                                        |            | Matrix Spike (MS) Report |                         |                       |      |
|-------------------------------------------------------------------------|-----------|----------------------------------------|------------|--------------------------|-------------------------|-----------------------|------|
|                                                                         |           |                                        |            | Spike<br>Concentration   | Spike Recovery(%)<br>MS | Acceptable Limits (%) |      |
| Laboratory sample ID                                                    | Sample ID | Method: Compound                       | CAS Number |                          |                         | Low                   | High |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4040534)</b> |           |                                        |            |                          |                         |                       |      |
| EP2114300-001                                                           | Anonymous | ED041G: Sulfate as SO4 - Turbidimetric | 14808-79-8 | 100 mg/L                 | # Not Determined        | 70.0                  | 130  |
| <b>ED045G: Chloride by Discrete Analyser (QCLot: 4040533)</b>           |           |                                        |            |                          |                         |                       |      |
| EP2114300-001                                                           | Anonymous | ED045G: Chloride                       | 16887-00-6 | 1000 mg/L                | # Not Determined        | 70.0                  | 130  |



Sub-Matrix: **WATER**

| 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: 4051169)      |           |                                                                   |             |                          |                  |                       |      |
| EP2114394-006                                               | Anonymous | EP231X: Perfluorobutane sulfonic acid (PFBS)                      | 375-73-5    | 0.25 µg/L                | 120              | 72.0                  | 130  |
|                                                             |           | EP231X: Perfluoropentane sulfonic acid (PFPeS)                    | 2706-91-4   | 0.25 µg/L                | 102              | 71.0                  | 127  |
|                                                             |           | EP231X: Perfluorohexane sulfonic acid (PFHxS)                     | 355-46-4    | 0.25 µg/L                | 106              | 68.0                  | 131  |
|                                                             |           | EP231X: Perfluoroheptane sulfonic acid (PFHpS)                    | 375-92-8    | 0.25 µg/L                | 106              | 69.0                  | 134  |
|                                                             |           | EP231X: Perfluorooctane sulfonic acid (PFOS)                      | 1763-23-1   | 0.25 µg/L                | 111              | 65.0                  | 140  |
|                                                             |           | EP231X: Perfluorodecane sulfonic acid (PFDS)                      | 335-77-3    | 0.25 µg/L                | 100              | 53.0                  | 142  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4051169)    |           |                                                                   |             |                          |                  |                       |      |
| EP2114394-006                                               | Anonymous | EP231X: Perfluorobutanoic acid (PFBA)                             | 375-22-4    | 1.25 µg/L                | 101              | 73.0                  | 129  |
|                                                             |           | EP231X: Perfluoropentanoic acid (PFPeA)                           | 2706-90-3   | 0.25 µg/L                | 113              | 72.0                  | 129  |
|                                                             |           | EP231X: Perfluorohexanoic acid (PFHxA)                            | 307-24-4    | 0.25 µg/L                | 119              | 72.0                  | 129  |
|                                                             |           | EP231X: Perfluoroheptanoic acid (PFHpA)                           | 375-85-9    | 0.25 µg/L                | 124              | 72.0                  | 130  |
|                                                             |           | EP231X: Perfluorooctanoic acid (PFOA)                             | 335-67-1    | 0.25 µg/L                | 126              | 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                | 123              | 71.0                  | 129  |
|                                                             |           | EP231X: Perfluoroundecanoic acid (PFUnDA)                         | 2058-94-8   | 0.25 µg/L                | 122              | 69.0                  | 133  |
|                                                             |           | EP231X: Perfluorododecanoic acid (PFDoDA)                         | 307-55-1    | 0.25 µg/L                | 115              | 72.0                  | 134  |
|                                                             |           | EP231X: Perfluorotridecanoic acid (PFTrDA)                        | 72629-94-8  | 0.25 µg/L                | 108              | 65.0                  | 144  |
|                                                             |           | EP231X: Perfluorotetradecanoic acid (PFTeDA)                      | 376-06-7    | 0.625 µg/L               | 112              | 71.0                  | 132  |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4051169)        |           |                                                                   |             |                          |                  |                       |      |
| EP2114394-006                                               | Anonymous | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.25 µg/L                | 111              | 67.0                  | 137  |
|                                                             |           | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.625 µg/L               | 74.4             | 68.0                  | 141  |
|                                                             |           | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.625 µg/L               | 88.6             | 62.6                  | 147  |
|                                                             |           | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.625 µg/L               | 106              | 66.0                  | 145  |
|                                                             |           | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.625 µg/L               | 101              | 57.6                  | 145  |
|                                                             |           | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9   | 0.25 µg/L                | 115              | 65.0                  | 136  |
|                                                             |           | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.25 µg/L                | 129              | 61.0                  | 135  |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4051169) |           |                                                                   |             |                          |                  |                       |      |
| EP2114394-006                                               | Anonymous | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.25 µg/L                | 110              | 63.0                  | 143  |
|                                                             |           | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 27619-97-2  | 0.25 µg/L                | 131              | 64.0                  | 140  |
|                                                             |           | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | 39108-34-4  | 0.25 µg/L                | 118              | 67.0                  | 138  |
|                                                             |           | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | 120226-60-0 | 0.25 µg/L                | 92.8             | 71.4                  | 144  |

## QA/QC Compliance Assessment to assist with Quality Review

Work Order : EP2114398

Page : 1 of 5

Client : CARDNO (WA) PTY LTD  
Contact :   
Project : WA\_0960\_PFASOMP  
Site : DEF19009/Learmonth  
Sampler :   
Order number : DEF19009/0960

Laboratory : Environmental Division Perth  
Telephone : +61-8-9406 1301  
Date Samples Received : 26-Nov-2021  
Issue Date : 07-Dec-2021  
No. of samples received : 7  
No. of samples analysed : 7

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

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

### Summary of Outliers

#### Outliers : Quality Control Samples

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

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

#### Outliers : Analysis Holding Time Compliance

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

#### Outliers : Frequency of Quality Control Samples

- **NO** Quality Control Sample Frequency Outliers exist.



## Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

| Compound Group Name                                         | Laboratory Sample ID | Client Sample ID | Analyte                                          | CAS Number | Data           | Limits | Comment                                                                                      |
|-------------------------------------------------------------|----------------------|------------------|--------------------------------------------------|------------|----------------|--------|----------------------------------------------------------------------------------------------|
| <b>Matrix Spike (MS) Recoveries</b>                         |                      |                  |                                                  |            |                |        |                                                                                              |
| ED041G: Sulfate (Turbidimetric) as SO <sub>4</sub> 2- by DA | EP2114300--001       | Anonymous        | <b>Sulfate as SO<sub>4</sub> - Turbidimetric</b> | 14808-79-8 | Not Determined | ----   | <b>MS recovery not determined, background level greater than or equal to 4x spike level.</b> |
| ED045G: Chloride by Discrete Analyser                       | EP2114300--001       | Anonymous        | <b>Chloride</b>                                  | 16887-00-6 | Not Determined | ----   | <b>MS recovery not determined, background level greater than or equal to 4x spike level.</b> |

## Analysis Holding Time Compliance

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

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

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

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

Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                                                                                    | Sample Date                              | Extraction / Preparation |                    |            | Analysis      |                  |             |   |
|-----------------------------------------------------------------------------------------------------------|------------------------------------------|--------------------------|--------------------|------------|---------------|------------------|-------------|---|
| Container / Client Sample ID(s)                                                                           |                                          | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation  |   |
| ED037P: Alkalinity by PC Titrator                                                                         |                                          |                          |                    |            |               |                  |             |   |
| Clear Plastic Bottle - Natural (ED037-P)<br>0960_SW305_211124,<br>0960_SW001_211124,<br>0960_SW211_211124 | 0960_SW304_211124,<br>0960_SW300_211124, | 24-Nov-2021              | ----               | ----       | ----          | 03-Dec-2021      | 08-Dec-2021 | ✔ |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA                                                           |                                          |                          |                    |            |               |                  |             |   |
| Clear Plastic Bottle - Natural (ED041G)<br>0960_SW305_211124,<br>0960_SW001_211124,<br>0960_SW211_211124  | 0960_SW304_211124,<br>0960_SW300_211124, | 24-Nov-2021              | ----               | ----       | ----          | 06-Dec-2021      | 22-Dec-2021 | ✔ |
| ED045G: Chloride by Discrete Analyser                                                                     |                                          |                          |                    |            |               |                  |             |   |
| Clear Plastic Bottle - Natural (ED045G)<br>0960_SW305_211124,<br>0960_SW001_211124,<br>0960_SW211_211124  | 0960_SW304_211124,<br>0960_SW300_211124, | 24-Nov-2021              | ----               | ----       | ----          | 06-Dec-2021      | 22-Dec-2021 | ✔ |
| ED093F: Dissolved Major Cations                                                                           |                                          |                          |                    |            |               |                  |             |   |
| Clear Plastic Bottle - Natural (ED093F)<br>0960_SW305_211124,<br>0960_SW001_211124,<br>0960_SW211_211124  | 0960_SW304_211124,<br>0960_SW300_211124, | 24-Nov-2021              | ----               | ----       | ----          | 01-Dec-2021      | 01-Dec-2021 | ✔ |





Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                                                                                         | Sample Date                                                    | Extraction / Preparation |                    |             | Analysis      |                  |             |   |
|----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|--------------------------|--------------------|-------------|---------------|------------------|-------------|---|
| Container / Client Sample ID(s)                                                                                |                                                                | Date extracted           | Due for extraction | Evaluation  | Date analysed | Due for analysis | Evaluation  |   |
| EP231A: Perfluoroalkyl Sulfonic Acids                                                                          |                                                                |                          |                    |             |               |                  |             |   |
| HDPE (no PTFE) (EP231X)<br>0960_SW305_211124,<br>0960_SW304_211124,<br>0960_SW300_211124,<br>0960_SW211_211124 | 0960_QC123_211124,<br>0960_SW001_211124,<br>0960_QC126_211124, | 24-Nov-2021              | 02-Dec-2021        | 23-May-2022 | ✔             | 03-Dec-2021      | 23-May-2022 | ✔ |
| EP231B: Perfluoroalkyl Carboxylic Acids                                                                        |                                                                |                          |                    |             |               |                  |             |   |
| HDPE (no PTFE) (EP231X)<br>0960_SW305_211124,<br>0960_SW304_211124,<br>0960_SW300_211124,<br>0960_SW211_211124 | 0960_QC123_211124,<br>0960_SW001_211124,<br>0960_QC126_211124, | 24-Nov-2021              | 02-Dec-2021        | 23-May-2022 | ✔             | 03-Dec-2021      | 23-May-2022 | ✔ |
| EP231C: Perfluoroalkyl Sulfonamides                                                                            |                                                                |                          |                    |             |               |                  |             |   |
| HDPE (no PTFE) (EP231X)<br>0960_SW305_211124,<br>0960_SW304_211124,<br>0960_SW300_211124,<br>0960_SW211_211124 | 0960_QC123_211124,<br>0960_SW001_211124,<br>0960_QC126_211124, | 24-Nov-2021              | 02-Dec-2021        | 23-May-2022 | ✔             | 03-Dec-2021      | 23-May-2022 | ✔ |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids                                                                     |                                                                |                          |                    |             |               |                  |             |   |
| HDPE (no PTFE) (EP231X)<br>0960_SW305_211124,<br>0960_SW304_211124,<br>0960_SW300_211124,<br>0960_SW211_211124 | 0960_QC123_211124,<br>0960_SW001_211124,<br>0960_QC126_211124, | 24-Nov-2021              | 02-Dec-2021        | 23-May-2022 | ✔             | 03-Dec-2021      | 23-May-2022 | ✔ |
| EP231P: PFAS Sums                                                                                              |                                                                |                          |                    |             |               |                  |             |   |
| HDPE (no PTFE) (EP231X)<br>0960_SW305_211124,<br>0960_SW304_211124,<br>0960_SW300_211124,<br>0960_SW211_211124 | 0960_QC123_211124,<br>0960_SW001_211124,<br>0960_QC126_211124, | 24-Nov-2021              | 02-Dec-2021        | 23-May-2022 | ✔             | 03-Dec-2021      | 23-May-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                            |         | Count |         | Rate (%) |          |            | Quality Control Specification  |
|--------------------------------------------------------|---------|-------|---------|----------|----------|------------|--------------------------------|
| Analytical Methods                                     | Method  | QC    | Regular | Actual   | Expected | Evaluation |                                |
|                                                        |         |       |         |          |          |            |                                |
| Laboratory Duplicates (DUP)                            |         |       |         |          |          |            |                                |
| Alkalinity by PC Titrator                              | ED037-P | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 4     | 34      | 11.76    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 2     | 19      | 10.53    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Laboratory Control Samples (LCS)                       |         |       |         |          |          |            |                                |
| Alkalinity by PC Titrator                              | ED037-P | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 2     | 34      | 5.88     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 19      | 5.26     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Method Blanks (MB)                                     |         |       |         |          |          |            |                                |
| Alkalinity by PC Titrator                              | ED037-P | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 2     | 34      | 5.88     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 19      | 5.26     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Matrix Spikes (MS)                                     |         |       |         |          |          |            |                                |
| Chloride by Discrete Analyser                          | ED045G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 19      | 5.26     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |



## Brief Method Summaries

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

| Analytical Methods                                                 | Method       | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------------------|--------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alkalinity by PC Titrator                                          | ED037-P      | WATER  | In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                                                                                                                                                                                                                |
| Sulfate (Turbidimetric) as SO <sub>4</sub> 2- by Discrete Analyser | ED041G       | WATER  | In house: Referenced to APHA 4500-SO <sub>4</sub> . Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO <sub>4</sub> suspension is measured by a photometer and the SO <sub>4</sub> -2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                         |
| Chloride by Discrete Analyser                                      | ED045G       | WATER  | In house: Referenced to APHA 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA seal method 2 017-1-L                                                                                                                                                                                                                                                                                                                                      |
| Major Cations - Dissolved                                          | ED093F       | WATER  | In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                           |
| Ionic Balance by PCT DA and Turbi SO <sub>4</sub> DA               | * EN055 - PG | WATER  | In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS               | EP231X       | WATER  | In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements. |
| Preparation Methods                                                | Method       | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Solid Phase Extraction (SPE) for PFAS in water                     | ORG72        | WATER  | In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.                                                                                                                                                                                                |



# CHAIN OF CUSTODY

COC#: 30650 ALS Laboratory: EP Perth

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:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: CG- DEF19009/Learmonth SW

ORDER NO: DEF19009/0960

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

SAMPLER MOBILE:  
/ ES2019CARBSD0002

## SAMPLE DETAILS

## ANALYSIS REQUIRED

| SAMPLE | NAME              | DESCRIPTION | DATE / TIME         | MATRIX | TOTAL BOTTLES        | ON HOLD | Surface Waters Primary WATER | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|-------------------|-------------|---------------------|--------|----------------------|---------|------------------------------|----------------------|------------------------|
| 001    | 0960_SW207_211124 |             | 24/11/2021 02:23 PM | Water  | ALS: 4<br>Non ALS: 0 | No      | Partial 4/8                  |                      |                        |
| 002    | 0960_SW209_211124 |             | 24/11/2021 02:55 PM | Water  | ALS: 4<br>Non ALS: 0 | No      | Partial 4/8                  |                      |                        |
| 003    | 0960_QC128_211124 |             | 24/11/2021 02:56 PM | Water  | ALS: 2<br>Non ALS: 0 | No      | Partial 1/8                  |                      |                        |
| 004    | 0960_SW302_211124 |             | 24/11/2021 03:24 PM | Water  | ALS: 4<br>Non ALS: 0 | No      | Partial 4/8                  |                      |                        |
| 005    | 0960_SW303_211124 |             | 24/11/2021 03:42 PM | Water  | ALS: 4<br>Non ALS: 0 | No      | Partial 4/8                  |                      |                        |



# CHAIN OF CUSTODY

ALS COC#: 30650

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: CG- DEF19009/Learmonth SW

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:  
/ ES2019CARBSD0002

## LABORATORY USE ONLY (Circle)

Custody Seal intact?

Yes 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    | 0960_SW207_211124 | Surface Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 002    | 0960_SW209_211124 | Surface Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 003    | 0960_QC128_211124 | Surface Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 004    | 0960_SW302_211124 | Surface Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 005    | 0960_SW303_211124 | Surface Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |



# CHAIN OF CUSTODY

(ALS) COC#: 30650 ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: CG-DEF19009/Learmonth SW

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:  
/ ES2019CARBSD0002

## LABORATORY USE ONLY (Circle)

Custody Seal intact?

Yes 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    | 0960_SW207_211124 | Clear Plastic Bottle - Natural | 250 mL | 00070220143085 | Green | No       |        |
| 001    | 0960_SW207_211124 | Clear Plastic Bottle - Natural | 250 mL | 00070220143015 | Green | No       |        |
| 001    | 0960_SW207_211124 | HDPE (no PTFE)                 | 20 mL  | 00352010040084 | Grey  | No       |        |
| 001    | 0960_SW207_211124 | HDPE (no PTFE)                 | 20 mL  | 00352010040091 | Grey  | No       |        |
| 002    | 0960_SW209_211124 | Clear Plastic Bottle - Natural | 250 mL | 00070220143080 | Green | No       |        |
| 002    | 0960_SW209_211124 | Clear Plastic Bottle - Natural | 250 mL | 00070220143142 | Green | No       |        |
| 002    | 0960_SW209_211124 | HDPE (no PTFE)                 | 20 mL  | 00352010040155 | Grey  | No       |        |
| 002    | 0960_QC128_211124 | HDPE (no PTFE)                 | 20 mL  | 00352010040385 | Grey  | No       |        |
| 003    | 0960_QC128_211124 | HDPE (no PTFE)                 | 20 mL  | 00350019163945 | Grey  | No       |        |
| 003    | 0960_SW302_211124 | Clear Plastic Bottle - Natural | 250 mL | 00070220142804 | Green | No       |        |
| 004    | 0960_SW302_211124 | Clear Plastic Bottle - Natural | 250 mL | 00070220142907 | Green | No       |        |
| 004    | 0960_SW302_211124 | HDPE (no PTFE)                 | 20 mL  | 00352010039972 | Grey  | No       |        |
| 004    | 0960_SW302_211124 | HDPE (no PTFE)                 | 20 mL  | 00352010040178 | Grey  | No       |        |
| 005    | 0960_SW303_211124 | Clear Plastic Bottle - Natural | 250 mL | 00070220142909 | Green | No       |        |
| 005    | 0960_SW303_211124 | Clear Plastic Bottle - Natural | 250 mL | 00070220142787 | Green | No       |        |
| 005    | 0960_SW303_211124 | HDPE (no PTFE)                 | 20 mL  | 00352010040096 | Grey  | No       |        |
| 005    | 0960_SW303_211124 | HDPE (no PTFE)                 | 20 mL  | 00352010040013 | Grey  | No       |        |

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



**SAMPLE RECEIPT NOTIFICATION (SRN)****Work Order : EP2114399**

|              |                                                                  |              |                                              |
|--------------|------------------------------------------------------------------|--------------|----------------------------------------------|
| Client       | : CARDNO (WA) PTY LTD                                            | Laboratory   | : Environmental Division Perth               |
| Contact      | : [REDACTED]                                                     | Contact      | : [REDACTED]                                 |
| Address      | : 11 HARVEST TERRACE PO BOX 155<br>WEST PERTH WA, AUSTRALIA 6006 | Address      | : 26 Rigali Way Wangara WA Australia<br>6065 |
| E-mail       | : [REDACTED]@cardno.com.au                                       | E-mail       | : [REDACTED]@alsglobal.com                   |
| Telephone    | : ----                                                           | Telephone    | : +61-8-9406 1301                            |
| Facsimile    | : ----                                                           | Facsimile    | : +61-8-9406 1399                            |
| Project      | : WA_0960_PFASOMP                                                | Page         | : 1 of 2                                     |
| Order number | : DEF19009/0960                                                  | Quote number | : ES2019CARBSD0002 (SY/139/19)               |
| C-O-C number | : 30650                                                          | QC Level     | : NEPM 2013 B3 & ALS QC Standard             |
| Site         | : DEF19009/Learmonth                                             |              |                                              |
| Sampler      | : [REDACTED]                                                     |              |                                              |

**Dates**

|                           |                     |                          |                      |
|---------------------------|---------------------|--------------------------|----------------------|
| Date Samples Received     | : 26-Nov-2021 09:55 | Issue Date               | : 26-Nov-2021        |
| Client Requested Due Date | : 07-Dec-2021       | Scheduled Reporting Date | : <b>07-Dec-2021</b> |

**Delivery Details**

|                      |              |                                    |                      |
|----------------------|--------------|------------------------------------|----------------------|
| Mode of Delivery     | : Carrier    | Security Seal                      | : Not Available      |
| No. of coolers/boxes | : 3          | Temperature                        | : 24.8 - Ice present |
| Receipt Detail       | : Ice Melted | 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
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepancies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **PFAS analysis will be conducted by ALS Environmental, Sydney, NATA accreditation no. 825, Site No. 10911.**
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.



## Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exists.

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

| Laboratory sample ID | Sampling date / time | Sample ID         | WATER - EN055 - PG<br>Ionic Balance by ED037P, ED041G, ED045G &<br>WATER - EP231X<br>PFAS - Full Suite (28 analytes) | WATER - NT-01<br>Major Cations (Ca, Mg, Na, K) | WATER - NT-02<br>Major Anions (Chloride, Sulphate, Alkalinity) |
|----------------------|----------------------|-------------------|----------------------------------------------------------------------------------------------------------------------|------------------------------------------------|----------------------------------------------------------------|
| EP2114399-001        | 24-Nov-2021 14:23    | 0960_SW207_211124 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114399-002        | 24-Nov-2021 14:55    | 0960_SW209_211124 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114399-003        | 24-Nov-2021 14:56    | 0960_QC128_211124 |                                                                                                                      | ✓                                              |                                                                |
| EP2114399-004        | 24-Nov-2021 15:24    | 0960_SW302_211124 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114399-005        | 24-Nov-2021 15:42    | 0960_SW303_211124 | ✓                                                                                                                    | ✓                                              | ✓                                                              |

## Proactive Holding Time Report

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

## Requested Deliverables

|                                                                                                                                                                                                                                                                                                                                                                                                                          |       |                              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------------------------------|
| <ul style="list-style-type: none"> <li>- A4 - AU Tax Invoice (INV)</li> </ul>                                                                                                                                                                                                                                                                                                                                            | Email | cardno.com.au                |
| <b>DERP LAB REPORTS</b> <ul style="list-style-type: none"> <li>- EDI Format - ESDAT (ESDAT)</li> </ul>                                                                                                                                                                                                                                                                                                                   | Email | derp.labreports@esdat.com.au |
| <ul style="list-style-type: none"> <li>- *AU Certificate of Analysis - NATA (COA)</li> <li>- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)</li> <li>- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)</li> <li>- A4 - AU Sample Receipt Notification - Environmental HT (SRN)</li> <li>- Chain of Custody (CoC) (COC)</li> <li>- EDI Format - ESDAT (ESDAT)</li> <li>- EDI Format - XTab (XTAB)</li> </ul> | Email | cardno.com.au                |
| <b>Perth</b> <ul style="list-style-type: none"> <li>- A4 - AU Tax Invoice (INV)</li> </ul>                                                                                                                                                                                                                                                                                                                               | Email | perth@cardno.com.au          |

## CERTIFICATE OF ANALYSIS

**Work Order** : EP2114399  
**Client** : CARDNO (WA) PTY LTD  
**Contact** : [REDACTED]  
**Address** : 11 HARVEST TERRACE PO BOX 155  
 WEST PERTH WA, AUSTRALIA 6006  
**Telephone** : ----  
**Project** : WA\_0960\_PFASOMP  
**Order number** : DEF19009/0960  
**C-O-C number** : 30650  
**Sampler** : [REDACTED]  
**Site** : DEF19009/Learmonth  
**Quote number** : SY/139/19  
**No. of samples received** : 5  
**No. of samples analysed** : 5

**Page** : 1 of 6  
**Laboratory** : Environmental Division Perth  
**Contact** : [REDACTED]  
**Address** : 26 Rigali Way Wangara WA Australia 6065  
**Telephone** : +61-8-9406 1301  
**Date Samples Received** : 26-Nov-2021 09:55  
**Date Analysis Commenced** : 01-Dec-2021  
**Issue Date** : 06-Dec-2021 21:51



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>    |
|------------------------------------------------------------------------|----------------------------|----------------------------------|
| <span style="background-color: black; color: black;">[REDACTED]</span> | Laboratory Manager (Perth) | Perth Inorganics, Wangara, WA    |
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator           | Sydney Organics, Smithfield, NSW |





## 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.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- 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.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, 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: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                                   |             |      |       | 0960_SW207_211124 | 0960_SW209_211124 | 0960_QC128_211124 | 0960_SW302_211124 | 0960_SW303_211124 |
|-------------------------------------------------------------------|-------------|------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                              |             |      |       | 24-Nov-2021 14:23 | 24-Nov-2021 14:55 | 24-Nov-2021 14:56 | 24-Nov-2021 15:24 | 24-Nov-2021 15:42 |
| Compound                                                          | CAS Number  | LOR  | Unit  | EP2114399-001     | EP2114399-002     | EP2114399-003     | EP2114399-004     | EP2114399-005     |
|                                                                   |             |      |       | Result            | Result            | Result            | Result            | Result            |
| <b>ED037P: Alkalinity by PC Titrator</b>                          |             |      |       |                   |                   |                   |                   |                   |
| Hydroxide Alkalinity as CaCO <sub>3</sub>                         | DMO-210-001 | 1    | mg/L  | <1                | <1                | ----              | <1                | <1                |
| Carbonate Alkalinity as CaCO <sub>3</sub>                         | 3812-32-6   | 1    | mg/L  | <1                | <1                | ----              | <1                | <1                |
| Bicarbonate Alkalinity as CaCO <sub>3</sub>                       | 71-52-3     | 1    | mg/L  | 170               | 204               | ----              | 184               | 207               |
| Total Alkalinity as CaCO <sub>3</sub>                             | ----        | 1    | mg/L  | 170               | 204               | ----              | 184               | 207               |
| <b>ED041G: Sulfate (Turbidimetric) as SO<sub>4</sub> 2- by DA</b> |             |      |       |                   |                   |                   |                   |                   |
| Sulfate as SO <sub>4</sub> - Turbidimetric                        | 14808-79-8  | 1    | mg/L  | 3060              | 3300              | ----              | 3730              | 3430              |
| <b>ED045G: Chloride by Discrete Analyser</b>                      |             |      |       |                   |                   |                   |                   |                   |
| Chloride                                                          | 16887-00-6  | 1    | mg/L  | 21400             | 22800             | ----              | 25100             | 23200             |
| <b>ED093F: Dissolved Major Cations</b>                            |             |      |       |                   |                   |                   |                   |                   |
| Calcium                                                           | 7440-70-2   | 1    | mg/L  | 542               | 595               | ----              | 648               | 620               |
| Magnesium                                                         | 7439-95-4   | 1    | mg/L  | 1680              | 1840              | ----              | 2120              | 1950              |
| Sodium                                                            | 7440-23-5   | 1    | mg/L  | 13200             | 14500             | ----              | 16900             | 15500             |
| Potassium                                                         | 7440-09-7   | 1    | mg/L  | 672               | 739               | ----              | 885               | 798               |
| <b>EN055: Ionic Balance</b>                                       |             |      |       |                   |                   |                   |                   |                   |
| ∅ Total Anions                                                    | ----        | 0.01 | meq/L | 671               | 716               | ----              | 789               | 730               |
| ∅ Total Cations                                                   | ----        | 0.01 | meq/L | 757               | 831               | ----              | 964               | 886               |
| ∅ Ionic Balance                                                   | ----        | 0.01 | %     | 6.02              | 7.42              | ----              | 9.99              | 9.66              |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>                      |             |      |       |                   |                   |                   |                   |                   |
| 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             |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>                    |             |      |       |                   |                   |                   |                   |                   |
| 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             |



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_SW207_211124 | 0960_SW209_211124 | 0960_QC128_211124 | 0960_SW302_211124 | 0960_SW303_211124 |
|------------------------------------------------------------|-------------|------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                       |             |      |      | 24-Nov-2021 14:23 | 24-Nov-2021 14:55 | 24-Nov-2021 14:56 | 24-Nov-2021 15:24 | 24-Nov-2021 15:42 |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2114399-001     | EP2114399-002     | EP2114399-003     | EP2114399-004     | EP2114399-005     |
|                                                            |             |      |      | Result            | Result            | Result            | Result            | Result            |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                   |                   |                   |                   |                   |
| 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             |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                   |                   |                   |                   |                   |
| Perfluorooctane sulfonamide (FOSA)                         | 754-91-6    | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)              | 31506-32-8  | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)               | 4151-50-2   | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)       | 24448-09-7  | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)        | 1691-99-2   | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)  | 2355-31-9   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)   | 2991-50-6   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                   |                   |                   |                   |                   |
| 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             |



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_SW207_211124 | 0960_SW209_211124 | 0960_QC128_211124 | 0960_SW302_211124 | 0960_SW303_211124 |
|---------------------------------------------------------------|--------------------|------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                          |                    |      |      | 24-Nov-2021 14:23 | 24-Nov-2021 14:55 | 24-Nov-2021 14:56 | 24-Nov-2021 15:24 | 24-Nov-2021 15:42 |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2114399-001     | EP2114399-002     | EP2114399-003     | EP2114399-004     | EP2114399-005     |
|                                                               |                    |      |      | Result            | Result            | Result            | Result            | Result            |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                   |                   |                   |                   |                   |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                   |                   |                   |                   |                   |
| 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             |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 118               | 114               | 105               | 106               | 115               |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 105               | 102               | 104               | 102               | 104               |

Page : 6 of 6  
Work Order : EP2114399  
Client : CARDNO (WA) PTY LTD  
Project : WA\_0960\_PFASOMP



## Surrogate Control Limits

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

## Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (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              | : EP2114399                                                      | Page                    | : 1 of 7                                  |
| Client                  | : CARDNO (WA) PTY LTD                                            | Laboratory              | : Environmental Division Perth            |
| Contact                 | : [REDACTED]                                                     | Contact                 | : [REDACTED]                              |
| Address                 | : 11 HARVEST TERRACE PO BOX 155<br>WEST PERTH WA, AUSTRALIA 6006 | Address                 | : 26 Rigali Way Wangara WA Australia 6065 |
| Telephone               | : ----                                                           | Telephone               | : +61-8-9406 1301                         |
| Project                 | : WA_0960_PFASOMP                                                | Date Samples Received   | : 26-Nov-2021                             |
| Order number            | : DEF19009/0960                                                  | Date Analysis Commenced | : 01-Dec-2021                             |
| C-O-C number            | : 30650                                                          | Issue Date              | : 06-Dec-2021                             |
| Sampler                 | : [REDACTED]                                                     |                         |                                           |
| Site                    | : DEF19009/Learmonth                                             |                         |                                           |
| Quote number            | : SY/139/19                                                      |                         |                                           |
| No. of samples received | : 5                                                              |                         |                                           |
| No. of samples analysed | : 5                                                              |                         |                                           |



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

This Quality Control Report contains the following information:

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

### Signatories

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

| Signatories | Position                   | Accreditation Category           |
|-------------|----------------------------|----------------------------------|
| [REDACTED]  | Laboratory Manager (Perth) | Perth Inorganics, Wangara, WA    |
| [REDACTED]  | LCMS Coordinator           | Sydney Organics, Smithfield, NSW |



## 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**

| Sub-Matrix: WATER                                                 |           |                                          |             | Laboratory Duplicate (DUP) Report |      |                 |                  |         |                    |
|-------------------------------------------------------------------|-----------|------------------------------------------|-------------|-----------------------------------|------|-----------------|------------------|---------|--------------------|
| Laboratory sample ID                                              | Sample ID | Method: Compound                         | CAS Number  | LOR                               | Unit | Original Result | Duplicate Result | RPD (%) | Acceptable RPD (%) |
| ED037P: Alkalinity by PC Titrator (QC Lot: 4053985)               |           |                                          |             |                                   |      |                 |                  |         |                    |
| EP2114398-003                                                     | Anonymous | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |           | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |           | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 252             | 252              | 0.0     | 0% - 20%           |
|                                                                   |           | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 252             | 252              | 0.0     | 0% - 20%           |
| EP2114468-008                                                     | Anonymous | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |           | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |           | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 402             | 394              | 2.0     | 0% - 20%           |
|                                                                   |           | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 402             | 394              | 2.0     | 0% - 20%           |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4040540) |           |                                          |             |                                   |      |                 |                  |         |                    |
| EP2114394-001                                                     | Anonymous | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 5390            | 5290             | 1.9     | 0% - 20%           |
| EP2114395-006                                                     | Anonymous | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 272             | 273              | 0.0     | 0% - 20%           |
| ED045G: Chloride by Discrete Analyser (QC Lot: 4040539)           |           |                                          |             |                                   |      |                 |                  |         |                    |
| EP2114394-001                                                     | Anonymous | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 36400           | 35700            | 1.8     | 0% - 20%           |
| EP2114395-006                                                     | Anonymous | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 3070            | 3150             | 2.4     | 0% - 20%           |
| ED093F: Dissolved Major Cations (QC Lot: 4042971)                 |           |                                          |             |                                   |      |                 |                  |         |                    |
| EP2114398-007                                                     | Anonymous | ED093F: Calcium                          | 7440-70-2   | 1                                 | mg/L | 886             | 886              | 0.0     | 0% - 20%           |
|                                                                   |           | ED093F: Magnesium                        | 7439-95-4   | 1                                 | mg/L | 2910            | 2930             | 0.6     | 0% - 20%           |
|                                                                   |           | ED093F: Sodium                           | 7440-23-5   | 1                                 | mg/L | 23300           | 23400            | 0.4     | 0% - 20%           |
|                                                                   |           | ED093F: Potassium                        | 7440-09-7   | 1                                 | mg/L | 1030            | 1040             | 0.9     | 0% - 20%           |
| EP2114511-001                                                     | Anonymous | ED093F: Calcium                          | 7440-70-2   | 1                                 | mg/L | 86              | 85               | 0.0     | 0% - 20%           |
|                                                                   |           | ED093F: Magnesium                        | 7439-95-4   | 1                                 | mg/L | 49              | 49               | 0.0     | 0% - 20%           |
|                                                                   |           | ED093F: Sodium                           | 7440-23-5   | 1                                 | mg/L | 102             | 102              | 0.0     | 0% - 20%           |
|                                                                   |           | ED093F: Potassium                        | 7440-09-7   | 1                                 | mg/L | 6               | 6                | 0.0     | 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: 4051170)      |           |                                                                   |             |                                   |      |                 |                  |         |                    |
| ES2143285-001                                                | 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: 4051170)    |           |                                                                   |             |                                   |      |                 |                  |         |                    |
| ES2143285-001                                                | 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 (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: 4051170)        |           |                                                                   |             |                                   |      |                 |                  |         |                    |
| ES2143285-001                                                | Anonymous | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                              |           | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                              |           | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                              |           | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                              |           | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                              |           | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                              |           | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4051170) |           |                                                                   |             |                                   |      |                 |                  |         |                    |
| ES2143285-001                                                | 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           |



| Sub-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: 4051170) - continued |           |                                                     |             |                                   |      |                 |                  |         |                    |
| ES2143285-001                                                            | Anonymous | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS) | 120226-60-0 | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
| EP231P: PFAS Sums (QC Lot: 4051170)                                      |           |                                                     |             |                                   |      |                 |                  |         |                    |
| ES2143285-001                                                            | Anonymous | EP231X: Sum of PFAS                                 | ----        | 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**

| Sub-Matrix: WATER                                                |                 |      |      | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |      |
|------------------------------------------------------------------|-----------------|------|------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|------|
|                                                                  |                 |      |      |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |      |
| Method: Compound                                                 | CAS Number      | LOR  | Unit | Result                      |                                       |                           |                                   |      |
| ED037P: Alkalinity by PC Titrator (QCLot: 4053985)               |                 |      |      |                             |                                       |                           |                                   |      |
| ED037-P: Hydroxide Alkalinity as CaCO3                           | DMO-210-00<br>1 | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Carbonate Alkalinity as CaCO3                           | 3812-32-6       | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Bicarbonate Alkalinity as CaCO3                         | 71-52-3         | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Total Alkalinity as CaCO3                               | ----            | 1    | mg/L | <1                          | 20 mg/L                               | 110                       | 81.2                              | 126  |
|                                                                  |                 |      |      | <1                          | 200 mg/L                              | 99.4                      | 90.0                              | 110  |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4040540) |                 |      |      |                             |                                       |                           |                                   |      |
| ED041G: Sulfate as SO4 - Turbidimetric                           | 14808-79-8      | 1    | mg/L | <1                          | 25 mg/L                               | 102                       | 87.7                              | 113  |
|                                                                  |                 |      |      | <1                          | 500 mg/L                              | 104                       | 87.7                              | 113  |
| ED045G: Chloride by Discrete Analyser (QCLot: 4040539)           |                 |      |      |                             |                                       |                           |                                   |      |
| ED045G: Chloride                                                 | 16887-00-6      | 1    | mg/L | <1                          | 10 mg/L                               | 98.7                      | 87.9                              | 114  |
|                                                                  |                 |      |      | <1                          | 1000 mg/L                             | 102                       | 87.9                              | 114  |
| ED093F: Dissolved Major Cations (QCLot: 4042971)                 |                 |      |      |                             |                                       |                           |                                   |      |
| ED093F: Calcium                                                  | 7440-70-2       | 1    | mg/L | <1                          | 50 mg/L                               | 99.9                      | 85.9                              | 113  |
| ED093F: Magnesium                                                | 7439-95-4       | 1    | mg/L | <1                          | 50 mg/L                               | 98.8                      | 88.0                              | 110  |
| ED093F: Sodium                                                   | 7440-23-5       | 1    | mg/L | <1                          | 50 mg/L                               | 104                       | 87.3                              | 118  |
| ED093F: Potassium                                                | 7440-09-7       | 1    | mg/L | <1                          | 50 mg/L                               | 92.5                      | 89.7                              | 108  |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4051170)           |                 |      |      |                             |                                       |                           |                                   |      |
| EP231X: Perfluorobutane sulfonic acid (PFBS)                     | 375-73-5        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 127                       | 72.0                              | 130  |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)                   | 2706-91-4       | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 110                       | 71.0                              | 127  |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)                    | 355-46-4        | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 104                       | 68.0                              | 131  |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)                   | 375-92-8        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 103                       | 69.0                              | 134  |
| EP231X: Perfluorooctane sulfonic acid (PFOS)                     | 1763-23-1       | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 119                       | 65.0                              | 140  |
| EP231X: Perfluorodecane sulfonic acid (PFDS)                     | 335-77-3        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 113                       | 53.0                              | 142  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4051170)         |                 |      |      |                             |                                       |                           |                                   |      |
| EP231X: Perfluorobutanoic acid (PFBA)                            | 375-22-4        | 0.1  | µg/L | <0.1                        | 1.25 µg/L                             | 98.4                      | 73.0                              | 129  |
| EP231X: Perfluoropentanoic acid (PFPeA)                          | 2706-90-3       | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 116                       | 72.0                              | 129  |
| EP231X: Perfluorohexanoic acid (PFHxA)                           | 307-24-4        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 123                       | 72.0                              | 129  |
| EP231X: Perfluoroheptanoic acid (PFHpA)                          | 375-85-9        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 124                       | 72.0                              | 130  |
| EP231X: Perfluorooctanoic acid (PFOA)                            | 335-67-1        | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 125                       | 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                             | 120                       | 71.0                              | 129  |
| EP231X: Perfluoroundecanoic acid (PFUnDA)                        | 2058-94-8       | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 121                       | 69.0                              | 133  |
| EP231X: Perfluorododecanoic acid (PFDODA)                        | 307-55-1        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 120                       | 72.0                              | 134  |





Sub-Matrix: **WATER**

| Sub-Matrix: WATER                                                    |             |      |      | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |     |
|----------------------------------------------------------------------|-------------|------|------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|-----|
|                                                                      |             |      |      |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |     |
| Method: Compound                                                     | CAS Number  | LOR  | Unit | Result                      |                                       |                           |                                   |     |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4051170) - continued |             |      |      |                             |                                       |                           |                                   |     |
| EP231X: Perfluorotridecanoic acid (PFTrDA)                           | 72629-94-8  | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 125                       | 65.0                              | 144 |
| EP231X: Perfluorotetradecanoic acid (PFTeDA)                         | 376-06-7    | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 114                       | 71.0                              | 132 |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4051170)                 |             |      |      |                             |                                       |                           |                                   |     |
| EP231X: Perfluorooctane sulfonamide (FOSA)                           | 754-91-6    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 105                       | 67.0                              | 137 |
| EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)                | 31506-32-8  | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 94.0                      | 68.0                              | 141 |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)                 | 4151-50-2   | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 89.9                      | 62.6                              | 147 |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)         | 24448-09-7  | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 103                       | 66.0                              | 145 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)          | 1691-99-2   | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 94.4                      | 57.6                              | 145 |
| 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                             | 121                       | 61.0                              | 135 |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4051170)          |             |      |      |                             |                                       |                           |                                   |     |
| EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                    | 757124-72-4 | 0.05 | µg/L | <0.05                       | 0.25 µg/L                             | 105                       | 63.0                              | 143 |
| EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                    | 27619-97-2  | 0.05 | µg/L | <0.05                       | 0.25 µg/L                             | 113                       | 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                             | 104                       | 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                             | 107                       | 71.4                              | 144 |

## Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

|                                                                         |           |                                                |            | Matrix Spike (MS) Report |                        |                       |      |
|-------------------------------------------------------------------------|-----------|------------------------------------------------|------------|--------------------------|------------------------|-----------------------|------|
|                                                                         |           |                                                |            | Spike<br>Concentration   | SpikeRecovery(%)<br>MS | Acceptable Limits (%) |      |
| Laboratory sample ID                                                    | Sample ID | Method: Compound                               | CAS Number |                          |                        | Low                   | High |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4040540)</b> |           |                                                |            |                          |                        |                       |      |
| EP2114394-001                                                           | Anonymous | ED041G: Sulfate as SO4 - Turbidimetric         | 14808-79-8 | 100 mg/L                 | # Not Determined       | 70.0                  | 130  |
| <b>ED045G: Chloride by Discrete Analyser (QCLot: 4040539)</b>           |           |                                                |            |                          |                        |                       |      |
| EP2114394-001                                                           | Anonymous | ED045G: Chloride                               | 16887-00-6 | 1000 mg/L                | # Not Determined       | 70.0                  | 130  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4051170)</b>           |           |                                                |            |                          |                        |                       |      |
| ES2143285-001                                                           | Anonymous | EP231X: Perfluorobutane sulfonic acid (PFBS)   | 375-73-5   | 0.25 µg/L                | 118                    | 72.0                  | 130  |
|                                                                         |           | EP231X: Perfluoropentane sulfonic acid (PFPeS) | 2706-91-4  | 0.25 µg/L                | 108                    | 71.0                  | 127  |
|                                                                         |           | EP231X: Perfluorohexane sulfonic acid (PFHxS)  | 355-46-4   | 0.25 µg/L                | 100                    | 68.0                  | 131  |
|                                                                         |           | EP231X: Perfluoroheptane sulfonic acid (PFHpS) | 375-92-8   | 0.25 µg/L                | 101                    | 69.0                  | 134  |



Sub-Matrix: **WATER**

| 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: 4051170) - continued |           |                                                                   |             |                          |                  |                       |      |
| ES2143285-001                                                      | Anonymous | EP231X: Perfluorooctane sulfonic acid (PFOS)                      | 1763-23-1   | 0.25 µg/L                | 114              | 65.0                  | 140  |
|                                                                    |           | EP231X: Perfluorodecane sulfonic acid (PFDS)                      | 335-77-3    | 0.25 µg/L                | 112              | 53.0                  | 142  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4051170)           |           |                                                                   |             |                          |                  |                       |      |
| ES2143285-001                                                      | Anonymous | EP231X: Perfluorobutanoic acid (PFBA)                             | 375-22-4    | 1.25 µg/L                | 98.5             | 73.0                  | 129  |
|                                                                    |           | EP231X: Perfluoropentanoic acid (PFPeA)                           | 2706-90-3   | 0.25 µg/L                | 122              | 72.0                  | 129  |
|                                                                    |           | EP231X: Perfluorohexanoic acid (PFHxA)                            | 307-24-4    | 0.25 µg/L                | 116              | 72.0                  | 129  |
|                                                                    |           | EP231X: Perfluoroheptanoic acid (PFHpA)                           | 375-85-9    | 0.25 µg/L                | 125              | 72.0                  | 130  |
|                                                                    |           | EP231X: Perfluorooctanoic acid (PFOA)                             | 335-67-1    | 0.25 µg/L                | 121              | 71.0                  | 133  |
|                                                                    |           | EP231X: Perfluorononanoic acid (PFNA)                             | 375-95-1    | 0.25 µg/L                | 114              | 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                | 115              | 69.0                  | 133  |
|                                                                    |           | EP231X: Perfluorododecanoic acid (PFDoDA)                         | 307-55-1    | 0.25 µg/L                | 123              | 72.0                  | 134  |
|                                                                    |           | EP231X: Perfluorotridecanoic acid (PFTrDA)                        | 72629-94-8  | 0.25 µg/L                | 128              | 65.0                  | 144  |
|                                                                    |           | EP231X: Perfluorotetradecanoic acid (PFTeDA)                      | 376-06-7    | 0.625 µg/L               | 113              | 71.0                  | 132  |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4051170)               |           |                                                                   |             |                          |                  |                       |      |
| ES2143285-001                                                      | Anonymous | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.25 µg/L                | 102              | 67.0                  | 137  |
|                                                                    |           | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.625 µg/L               | 87.2             | 68.0                  | 141  |
|                                                                    |           | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.625 µg/L               | 91.3             | 62.6                  | 147  |
|                                                                    |           | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.625 µg/L               | 108              | 66.0                  | 145  |
|                                                                    |           | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.625 µg/L               | 95.9             | 57.6                  | 145  |
|                                                                    |           | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9   | 0.25 µg/L                | 108              | 65.0                  | 136  |
|                                                                    |           | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.25 µg/L                | 124              | 61.0                  | 135  |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4051170)        |           |                                                                   |             |                          |                  |                       |      |
| ES2143285-001                                                      | Anonymous | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.25 µg/L                | 99.8             | 63.0                  | 143  |
|                                                                    |           | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 27619-97-2  | 0.25 µg/L                | 101              | 64.0                  | 140  |
|                                                                    |           | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | 39108-34-4  | 0.25 µg/L                | 107              | 67.0                  | 138  |
|                                                                    |           | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | 120226-60-0 | 0.25 µg/L                | 102              | 71.4                  | 144  |

## QA/QC Compliance Assessment to assist with Quality Review

Work Order : EP2114399

Page : 1 of 5

Client : CARDNO (WA) PTY LTD

Contact : [REDACTED]

Project : WA\_0960\_PFASOMP

Site : DEF19009/Learmonth

Sampler : [REDACTED]

Order number : DEF19009/0960

Laboratory : Environmental Division Perth

Telephone : +61-8-9406 1301

Date Samples Received : 26-Nov-2021

Issue Date : 06-Dec-2021

No. of samples received : 5

No. of samples analysed : 5

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

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

### Summary of Outliers

#### Outliers : Quality Control Samples

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

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

#### Outliers : Analysis Holding Time Compliance

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

#### Outliers : Frequency of Quality Control Samples

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

*Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes*

| Compound Group Name                             | Laboratory Sample ID | Client Sample ID | Analyte                               | CAS Number | Data           | Limits | Comment                                                                                      |
|-------------------------------------------------|----------------------|------------------|---------------------------------------|------------|----------------|--------|----------------------------------------------------------------------------------------------|
| <b>Matrix Spike (MS) Recoveries</b>             |                      |                  |                                       |            |                |        |                                                                                              |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA | EP2114394--001       | Anonymous        | <b>Sulfate as SO4 - Turbidimetric</b> | 14808-79-8 | Not Determined | ----   | <b>MS recovery not determined, background level greater than or equal to 4x spike level.</b> |
| ED045G: Chloride by Discrete Analyser           | EP2114394--001       | Anonymous        | <b>Chloride</b>                       | 16887-00-6 | Not Determined | ----   | <b>MS recovery not determined, background level greater than or equal to 4x spike level.</b> |

| Quality Control Sample Type                          | Count |         | Rate (%) |          | Quality Control Specification  |
|------------------------------------------------------|-------|---------|----------|----------|--------------------------------|
| Method                                               | QC    | Regular | Actual   | Expected |                                |
| Laboratory Duplicates (DUP)                          |       |         |          |          |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | 1     | 12      | 8.33     | 10.00    | NEPM 2013 B3 & ALS QC Standard |

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.

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                          |  | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |
|-------------------------------------------------|--|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|
| Container / Client Sample ID(s)                 |  |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| ED037P: Alkalinity by PC Titrator               |  |             |                          |                    |            |               |                  |            |
| Clear Plastic Bottle - Natural (ED037-P)        |  | 24-Nov-2021 | ----                     | ----               | ----       | 03-Dec-2021   | 08-Dec-2021      | ✓          |
| 0960_SW207_211124,                              |  |             |                          |                    |            |               |                  |            |
| 0960_SW302_211124,                              |  |             |                          |                    |            |               |                  |            |
| 0960_SW209_211124,                              |  |             |                          |                    |            |               |                  |            |
| 0960_SW303_211124                               |  |             |                          |                    |            |               |                  |            |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA |  |             |                          |                    |            |               |                  |            |
| Clear Plastic Bottle - Natural (ED041G)         |  | 24-Nov-2021 | ----                     | ----               | ----       | 02-Dec-2021   | 22-Dec-2021      | ✓          |
| 0960_SW207_211124,                              |  |             |                          |                    |            |               |                  |            |
| 0960_SW302_211124,                              |  |             |                          |                    |            |               |                  |            |
| 0960_SW209_211124,                              |  |             |                          |                    |            |               |                  |            |
| 0960_SW303_211124                               |  |             |                          |                    |            |               |                  |            |
| ED045G: Chloride by Discrete Analyser           |  |             |                          |                    |            |               |                  |            |
| Clear Plastic Bottle - Natural (ED045G)         |  | 24-Nov-2021 | ----                     | ----               | ----       | 02-Dec-2021   | 22-Dec-2021      | ✓          |
| 0960_SW207_211124,                              |  |             |                          |                    |            |               |                  |            |
| 0960_SW302_211124,                              |  |             |                          |                    |            |               |                  |            |
| 0960_SW209_211124,                              |  |             |                          |                    |            |               |                  |            |
| 0960_SW303_211124                               |  |             |                          |                    |            |               |                  |            |



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                                                                   | Sample Date                              | Extraction / Preparation |                    |             | Analysis      |                  |             |   |
|------------------------------------------------------------------------------------------|------------------------------------------|--------------------------|--------------------|-------------|---------------|------------------|-------------|---|
| Container / Client Sample ID(s)                                                          |                                          | Date extracted           | Due for extraction | Evaluation  | Date analysed | Due for analysis | Evaluation  |   |
| ED093F: Dissolved Major Cations                                                          |                                          |                          |                    |             |               |                  |             |   |
| Clear Plastic Bottle - Natural (ED093F)<br>0960_SW207_211124,<br>0960_SW302_211124,      | 0960_SW209_211124,<br>0960_SW303_211124  | 24-Nov-2021              | ----               | ----        | ----          | 01-Dec-2021      | 01-Dec-2021 | ✓ |
| EP231A: Perfluoroalkyl Sulfonic Acids                                                    |                                          |                          |                    |             |               |                  |             |   |
| HDPE (no PTFE) (EP231X)<br>0960_SW207_211124,<br>0960_QC128_211124,<br>0960_SW303_211124 | 0960_SW209_211124,<br>0960_SW302_211124, | 24-Nov-2021              | 03-Dec-2021        | 23-May-2022 | ✓             | 03-Dec-2021      | 23-May-2022 | ✓ |
| EP231B: Perfluoroalkyl Carboxylic Acids                                                  |                                          |                          |                    |             |               |                  |             |   |
| HDPE (no PTFE) (EP231X)<br>0960_SW207_211124,<br>0960_QC128_211124,<br>0960_SW303_211124 | 0960_SW209_211124,<br>0960_SW302_211124, | 24-Nov-2021              | 03-Dec-2021        | 23-May-2022 | ✓             | 03-Dec-2021      | 23-May-2022 | ✓ |
| EP231C: Perfluoroalkyl Sulfonamides                                                      |                                          |                          |                    |             |               |                  |             |   |
| HDPE (no PTFE) (EP231X)<br>0960_SW207_211124,<br>0960_QC128_211124,<br>0960_SW303_211124 | 0960_SW209_211124,<br>0960_SW302_211124, | 24-Nov-2021              | 03-Dec-2021        | 23-May-2022 | ✓             | 03-Dec-2021      | 23-May-2022 | ✓ |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids                                               |                                          |                          |                    |             |               |                  |             |   |
| HDPE (no PTFE) (EP231X)<br>0960_SW207_211124,<br>0960_QC128_211124,<br>0960_SW303_211124 | 0960_SW209_211124,<br>0960_SW302_211124, | 24-Nov-2021              | 03-Dec-2021        | 23-May-2022 | ✓             | 03-Dec-2021      | 23-May-2022 | ✓ |
| EP231P: PFAS Sums                                                                        |                                          |                          |                    |             |               |                  |             |   |
| HDPE (no PTFE) (EP231X)<br>0960_SW207_211124,<br>0960_QC128_211124,<br>0960_SW303_211124 | 0960_SW209_211124,<br>0960_SW302_211124, | 24-Nov-2021              | 03-Dec-2021        | 23-May-2022 | ✓             | 03-Dec-2021      | 23-May-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                            |         | Count |         | Rate (%) |          | Quality Control Specification |                                |
|--------------------------------------------------------|---------|-------|---------|----------|----------|-------------------------------|--------------------------------|
| Analytical Methods                                     | Method  | QC    | Regular | Actual   | Expected |                               | Evaluation                     |
|                                                        |         |       |         |          |          |                               |                                |
| Laboratory Duplicates (DUP)                            |         |       |         |          |          |                               |                                |
| Alkalinity by PC Titrator                              | ED037-P | 2     | 20      | 10.00    | 10.00    | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 2     | 20      | 10.00    | 10.00    | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 2     | 14      | 14.29    | 10.00    | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 12      | 8.33     | 10.00    | ✗                             | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 2     | 20      | 10.00    | 10.00    | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Laboratory Control Samples (LCS)                       |         |       |         |          |          |                               |                                |
| Alkalinity by PC Titrator                              | ED037-P | 2     | 20      | 10.00    | 10.00    | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 2     | 20      | 10.00    | 10.00    | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 1     | 14      | 7.14     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 12      | 8.33     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 2     | 20      | 10.00    | 10.00    | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Method Blanks (MB)                                     |         |       |         |          |          |                               |                                |
| Alkalinity by PC Titrator                              | ED037-P | 1     | 20      | 5.00     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 1     | 20      | 5.00     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 1     | 14      | 7.14     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 12      | 8.33     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 1     | 20      | 5.00     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Matrix Spikes (MS)                                     |         |       |         |          |          |                               |                                |
| Chloride by Discrete Analyser                          | ED045G  | 1     | 20      | 5.00     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 12      | 8.33     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 1     | 20      | 5.00     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |



## Brief Method Summaries

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

| Analytical Methods                                                 | Method       | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------------------|--------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alkalinity by PC Titrator                                          | ED037-P      | WATER  | In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                                                                                                                                                                                                                |
| Sulfate (Turbidimetric) as SO <sub>4</sub> 2- by Discrete Analyser | ED041G       | WATER  | In house: Referenced to APHA 4500-SO <sub>4</sub> . Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO <sub>4</sub> suspension is measured by a photometer and the SO <sub>4</sub> -2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                         |
| Chloride by Discrete Analyser                                      | ED045G       | WATER  | In house: Referenced to APHA 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA seal method 2 017-1-L                                                                                                                                                                                                                                                                                                                                      |
| Major Cations - Dissolved                                          | ED093F       | WATER  | In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                           |
| Ionic Balance by PCT DA and Turbi SO <sub>4</sub> DA               | * EN055 - PG | WATER  | In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS               | EP231X       | WATER  | In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements. |
| Preparation Methods                                                | Method       | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Solid Phase Extraction (SPE) for PFAS in water                     | ORG72        | WATER  | In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.                                                                                                                                                                                                |



# CHAIN OF CUSTODY

COC#: 30679

ALS Laboratory: EP Perth

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: MB\_DEF19009/Learmonth GW

ORDER NO: DEF19009/0960

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

SAMPLER MOBILE:

/ ES2019CARBSD0002

## LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes 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 | Ground Waters Primary WATER | Rinsate WATER | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION           |
|--------|------------------|-------------|------------------------|--------|----------------------|---------|-----------------------------|---------------|----------------------|----------------------------------|
| 001    | 0960_OTH107      |             | 25/11/2021<br>07:54 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial<br>4/8              |               |                      |                                  |
| 002    | 0960_OTH106      |             | 25/11/2021<br>08:05 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial<br>4/8              |               |                      |                                  |
| 003    | 0960_MW141_5-5.5 |             | 25/11/2021<br>08:23 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial<br>4/8              |               |                      |                                  |
| 004    | 0960_MW140_3.5-4 |             | 25/11/2021<br>09:33 AM | Water  | ALS: 5<br>Non ALS: 0 | No      | Partial<br>4/8              |               |                      | Extra PFAS bottles for<br>lab QC |
| 005    | 0960_MW181_3.5-4 |             | 25/11/2021<br>09:47 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial<br>4/8              |               |                      |                                  |
| 006    | 0960_MW143_3-3.5 |             | 25/11/2021<br>10:56 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial<br>4/8              |               |                      |                                  |
| 007    | 0960_MW127       |             | 25/11/2021<br>11:27 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial<br>4/8              |               |                      |                                  |
| 008    | 0060_MW126       |             | 25/11/2021<br>12:09 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial<br>4/8              |               |                      |                                  |
| 009    | 0960_MW112       |             | 25/11/2021<br>12:10 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial<br>4/8              |               |                      |                                  |

**CHAIN OF CUSTODY**

COC#: 30679

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: MB\_DEF19009/Learmonth GW

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:

/ ES2019CARBSD0002

**LABORATORY USE ONLY (Circle)**

Custody Seal intact?

Yes 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 | Ground Waters Primary WATER | Rinsate WATER | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|------------|-------------|---------------------|--------|----------------------|---------|-----------------------------|---------------|----------------------|------------------------|
| 010    | 0960_MW102 |             | 25/11/2021 12:31 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8                 |               |                      |                        |
| 011    | 0960_QC301 |             | 25/11/2021 01:55 PM | Water  | ALS: 2<br>Non ALS: 0 | No      |                             | X             |                      |                        |
| 012    | 0960_QC302 |             | 25/11/2021 01:55 PM | Water  | ALS: 2<br>Non ALS: 0 | No      |                             | X             |                      |                        |
| 013    | 0960_QC303 |             | 25/11/2021 01:56 PM | Water  | ALS: 2<br>Non ALS: 0 | No      |                             | X             |                      |                        |
| 014    | 0960_QC401 |             | 25/11/2021 01:58 PM | Water  | ALS: 2<br>Non ALS: 0 | No      |                             | X             |                      |                        |
| 015    | 0960_QC402 |             | 25/11/2021 01:59 PM | Water  | ALS: 2<br>Non ALS: 0 | No      |                             | X             |                      |                        |
| 016    | 0960_QC403 |             | 25/11/2021 02:00 PM | Water  | ALS: 2<br>Non ALS: 0 | No      |                             | X             |                      |                        |

**CHAIN OF CUSTODY**

COC#: 30679

ALS Laboratory: EP Perth

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: MB\_DEF19009/Learmonth GW

ORDER NO: DEF19009/0960

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

SAMPLER MOBILE:

/ ES2019CARBSD0002

**LABORATORY USE ONLY (Circle)**

Custody Seal intact? Yes 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    | 0960_OTH107      | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 002    | 0960_OTH106      | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 003    | 0960_MW141_5-5.5 | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 004    | 0960_MW140_3.5-4 | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 005    | 0960_MW181_3.5-4 | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 006    | 0960_MW143_3-3.5 | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 007    | 0960_MW127       | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 008    | 0060_MW126       | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 009    | 0960_MW112       | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |





# CHAIN OF CUSTODY

COC#: 30679

ALS Laboratory: EP Perth

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: MB\_DEF19009/Learmonth GW

ORDER NO: DEF19009/0960

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

SAMPLER MOBILE:

/ ES2019CARBSD0002

## LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

010

0960\_MW102

Ground Waters Primary WATER

Water

- NT-02 Major Anions (Chloride, Sulphate, Alkalinity)

- NT-01 Major Cations (Ca, Mg, Na, K)

- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F

- EP231X PFAS - Full Suite (28 analytes)

**CHAIN OF CUSTODY**

COC#: 30679

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: MB\_DEF19009/Learmonth GW

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:

/ ES2019CARBSD0002

**LABORATORY USE ONLY (Circle)**

Custody Seal intact?

Yes 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    | 0960_OTH107      | Clear Plastic Bottle - Natural | 250 mL | 00070621191222 | Green | No       |        |
| 001    | 0960_OTH107      | HDPE (no PTFE)                 | 20 mL  | 00352101038023 | Grey  | No       |        |
| 001    | 0960_OTH107      | HDPE (no PTFE)                 | 20 mL  | 00352101071353 | Grey  | No       |        |
| 002    | 0960_OTH106      | Clear Plastic Bottle - Natural | 250 mL | 00070621191192 | Green | No       |        |
| 002    | 0960_OTH106      | HDPE (no PTFE)                 | 20 mL  | 00352101071736 | Grey  | No       |        |
| 002    | 0960_OTH106      | HDPE (no PTFE)                 | 20 mL  | 00352101071051 | Grey  | No       |        |
| 003    | 0960_MW141_5-5.5 | Clear Plastic Bottle - Natural | 250 mL | 00070621191160 | Green | No       |        |
| 003    | 0960_MW141_5-5.5 | HDPE (no PTFE)                 | 20 mL  | 00352101071793 | Grey  | No       |        |
| 003    | 0960_MW141_5-5.5 | HDPE (no PTFE)                 | 20 mL  | 00352101071157 | Grey  | No       |        |
| 004    | 0960_MW140_3.5-4 | Clear Plastic Bottle - Natural | 250 mL | 00070621191106 | Green | No       |        |
| 004    | 0960_MW140_3.5-4 | HDPE (no PTFE)                 | 20 mL  | 00352101071268 | Grey  | No       |        |
| 004    | 0960_MW140_3.5-4 | HDPE (no PTFE)                 | 20 mL  | 00352101070893 | Grey  | No       |        |
| 004    | 0960_MW140_3.5-4 | HDPE (no PTFE)                 | 20 mL  | 00352101071656 | Grey  | No       |        |
| 004    | 0960_MW140_3.5-4 | HDPE (no PTFE)                 | 20 mL  | 00352101070917 | Grey  | No       |        |
| 005    | 0960_MW181_3.5-4 | Clear Plastic Bottle - Natural | 250 mL | 00070621191274 | Green | No       |        |
| 005    | 0960_MW181_3.5-4 | HDPE (no PTFE)                 | 20 mL  | 00352101071935 | Grey  | No       |        |
| 005    | 0960_MW181_3.5-4 | HDPE (no PTFE)                 | 20 mL  | 00352101071574 | Grey  | No       |        |
| 006    | 0960_MW143_3-3.5 | Clear Plastic Bottle - Natural | 250 mL | 00070621191282 | Green | No       |        |
| 006    | 0960_MW143_3-3.5 | HDPE (no PTFE)                 | 20 mL  | 00352101071962 | Grey  | No       |        |
| 006    | 0960_MW143_3-3.5 | HDPE (no PTFE)                 | 20 mL  | 00352101070926 | Grey  | No       |        |
| 007    | 0960_MW127       | Clear Plastic Bottle - Natural | 250 mL | 00070621191157 | Green | No       |        |
| 007    | 0960_MW127       | HDPE (no PTFE)                 | 20 mL  | 00352101071126 | Grey  | No       |        |
| 007    | 0960_MW127       | HDPE (no PTFE)                 | 20 mL  | 00352101071052 | Grey  | No       |        |
| 008    | 0060_MW126       | Clear Plastic Bottle - Natural | 250 mL | 00070621071179 | Green | No       |        |
| 008    | 0060_MW126       | HDPE (no PTFE)                 | 20 mL  | 00352101071542 | Grey  | No       |        |
| 008    | 0060_MW126       | HDPE (no PTFE)                 | 20 mL  | 00352101071950 | Grey  | No       |        |

**CHAIN OF CUSTODY**

COC#: 30679

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: MB\_DEF19009/Learmonth GW

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:

/ ES2019CARBSD0002

**LABORATORY USE ONLY (Circle)**

Custody Seal intact?

Yes No N/A

Free ice / frozen ice bricks present upon receipt?

Yes No N/A

Random Sample Temperature on Receipt:

°C

Other comments:

|     |            |                                |        |                |       |    |  |
|-----|------------|--------------------------------|--------|----------------|-------|----|--|
| 009 | 0960_MW112 | Clear Plastic Bottle - Natural | 250 mL | 00070621191124 | Green | No |  |
| 009 | 0960_MW112 | HDPE (no PTFE)                 | 20 mL  | 00352101071042 | Grey  | No |  |
| 009 | 0960_MW112 | HDPE (no PTFE)                 | 20 mL  | 00352101071728 | Grey  | No |  |
| 010 | 0960_MW102 | HDPE (no PTFE)                 | 20 mL  | 00352101071489 | Grey  | No |  |
| 010 | 0960_MW102 | Clear Plastic Bottle - Natural | 250 mL | 00070621191120 | Green | No |  |
| 010 | 0960_MW102 | HDPE (no PTFE)                 | 20 mL  | 00352101070889 | Grey  | No |  |
| 011 | 0960_QC301 | HDPE (no PTFE)                 | 20 mL  | 00352005020370 | Grey  | No |  |
| 011 | 0960_QC301 | HDPE (no PTFE)                 | 20 mL  | 00352005020600 | Grey  | No |  |
| 012 | 0960_QC302 | HDPE (no PTFE)                 | 20 mL  | 00352005020364 | Grey  | No |  |
| 012 | 0960_QC302 | HDPE (no PTFE)                 | 20 mL  | 00352005020400 | Grey  | No |  |
| 013 | 0960_QC303 | HDPE (no PTFE)                 | 20 mL  | 00352005020493 | Grey  | No |  |
| 013 | 0960_QC303 | HDPE (no PTFE)                 | 20 mL  | 00352005020599 | Grey  | No |  |
| 014 | 0960_QC401 | HDPE (no PTFE)                 | 20 mL  | 00352005020403 | Grey  | No |  |
| 014 | 0960_QC401 | HDPE (no PTFE)                 | 20 mL  | 00352005020434 | Grey  | No |  |
| 015 | 0960_QC402 | HDPE (no PTFE)                 | 20 mL  | 00350019035063 | Grey  | No |  |
| 015 | 0960_QC402 | HDPE (no PTFE)                 | 20 mL  | 00350019035116 | Grey  | No |  |
| 016 | 0960_QC403 | HDPE (no PTFE)                 | 20 mL  | 00350019041968 | Grey  | No |  |
| 016 | 0960_QC403 | HDPE (no PTFE)                 | 20 mL  | 00350019041933 | Grey  | No |  |

**Total Bottle Count: ALS: 44, Non ALS: 0**

**SAMPLE RECEIPT NOTIFICATION (SRN)****Work Order : EP2114471**

|              |                                                                  |              |                                              |
|--------------|------------------------------------------------------------------|--------------|----------------------------------------------|
| Client       | : CARDNO (WA) PTY LTD                                            | Laboratory   | : Environmental Division Perth               |
| Contact      | : [REDACTED]                                                     | Contact      | : Customer Services EP                       |
| Address      | : 11 HARVEST TERRACE PO BOX 155<br>WEST PERTH WA, AUSTRALIA 6006 | Address      | : 26 Rigali Way Wangara WA Australia<br>6065 |
| E-mail       | : [REDACTED]@cardno.com.au                                       | E-mail       | : ALSEnviro.Perth@alsglobal.com              |
| Telephone    | : ----                                                           | Telephone    | : +61-8-9406 1301                            |
| Facsimile    | : ----                                                           | Facsimile    | : +61-8-9406 1399                            |
| Project      | : WA_0960_PFASOMP                                                | Page         | : 1 of 3                                     |
| Order number | : DEF19009/0960                                                  | Quote number | : ES2019CARBSD0002 (SY/139/19)               |
| C-O-C number | : 30679                                                          | QC Level     | : NEPM 2013 B3 & ALS QC Standard             |
| Site         | : DEF19009/Learmonth                                             |              |                                              |
| Sampler      | : [REDACTED]                                                     |              |                                              |

**Dates**

|                           |                     |                          |                      |
|---------------------------|---------------------|--------------------------|----------------------|
| Date Samples Received     | : 29-Nov-2021 11:30 | Issue Date               | : 29-Nov-2021        |
| Client Requested Due Date | : 08-Dec-2021       | Scheduled Reporting Date | : <b>08-Dec-2021</b> |

**Delivery Details**

|                      |              |                                    |                      |
|----------------------|--------------|------------------------------------|----------------------|
| Mode of Delivery     | : Carrier    | Security Seal                      | : Not Available      |
| No. of coolers/boxes | : 2          | Temperature                        | : 23.1 - Ice present |
| Receipt Detail       | : Ice melted | 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
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepancies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **PFAS analysis will be conducted by ALS Environmental, Sydney, NATA accreditation no. 825, Site No. 10911.**
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.



## Sample Container(s)/Preservation Non-Compliances

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

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

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

EP2114471-003 : 25-Nov-2021 08:23 : 0960\_MW141\_5-5.5\_211125  
EP2114471-004 : 25-Nov-2021 09:33 : 0960\_MW140\_3.5-4\_211125  
EP2114471-005 : 25-Nov-2021 09:47 : 0960\_MW181\_3.5-4\_211125  
EP2114471-006 : 25-Nov-2021 10:56 : 0960\_MW143\_3-3.5\_211125

## 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 - EN055 - PG<br>Ionic Balance by ED037P, ED041G, ED045G &<br>WATER - EP231X<br>PFAS - Full Suite (28 analytes) | WATER - NT-01<br>Major Cations (Ca, Mg, Na, K) | WATER - NT-02<br>Major Anions (Chloride, Sulphate, Alkalinity) |
|----------------------|----------------------|-------------------------|----------------------------------------------------------------------------------------------------------------------|------------------------------------------------|----------------------------------------------------------------|
| EP2114471-001        | 25-Nov-2021 07:54    | 0960_OTH107_211125      | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114471-002        | 25-Nov-2021 08:05    | 0960_OTH106_211125      | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114471-003        | 25-Nov-2021 08:23    | 0960_MW141_5-5.5_211... | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114471-004        | 25-Nov-2021 09:33    | 0960_MW140_3.5-4_211... | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114471-005        | 25-Nov-2021 09:47    | 0960_MW181_3.5-4_211... | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114471-006        | 25-Nov-2021 10:56    | 0960_MW143_3-3.5_211... | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114471-007        | 25-Nov-2021 11:27    | 0960_MW127_211125       | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114471-008        | 25-Nov-2021 12:09    | 0060_MW126_211125       | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114471-009        | 25-Nov-2021 12:10    | 0960_MW112_211125       | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114471-010        | 25-Nov-2021 12:31    | 0960_MW102_211125       | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114471-011        | 25-Nov-2021 13:55    | 0960_QC301_211125       |                                                                                                                      | ✓                                              |                                                                |
| EP2114471-012        | 25-Nov-2021 13:55    | 0960_QC302_211125       |                                                                                                                      | ✓                                              |                                                                |
| EP2114471-013        | 25-Nov-2021 13:56    | 0960_QC303_211125       |                                                                                                                      | ✓                                              |                                                                |
| EP2114471-014        | 25-Nov-2021 13:58    | 0960_QC401_211125       |                                                                                                                      | ✓                                              |                                                                |
| EP2114471-015        | 25-Nov-2021 13:59    | 0960_QC402_211125       |                                                                                                                      | ✓                                              |                                                                |
| EP2114471-016        | 25-Nov-2021 14:00    | 0960_QC403_211125       |                                                                                                                      | ✓                                              |                                                                |

## Proactive Holding Time Report

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



### Accounts Payable Perth

- Email            perth@cardno.com.au

Email [REDACTED]cardno.com.au

- Email [REDACTED]cardno.com.au

- EDI Format - ESDAT (ESDAT)

- Email [derp.labreports@esdat.com.au](mailto:derp.labreports@esdat.com.au)

Email [REDACTED]cardno.com.au

- Email [REDACTED]cardno.com.au

- Email [REDACTED] cardno.com.au

- Email [REDACTED] cardno.com.au

- |       |            |               |
|-------|------------|---------------|
| Email | [REDACTED] | cardno.com.au |
| Email | [REDACTED] | cardno.com.au |

- |       |            |               |
|-------|------------|---------------|
| Email | [REDACTED] | cardno.com.au |
| Email | [REDACTED] | cardno.com.au |

- Email [REDACTED] cardno.com.au
- Email [REDACTED] cardno.com.au

- |       |            |               |
|-------|------------|---------------|
| Email | [REDACTED] | cardno.com.au |
| Email | [REDACTED] | cardno.com.au |

## CERTIFICATE OF ANALYSIS

**Work Order** : EP2114471  
**Client** : CARDNO (WA) PTY LTD  
**Contact** : [REDACTED]  
**Address** : 11 HARVEST TERRACE PO BOX 155  
 WEST PERTH WA, AUSTRALIA 6006  
**Telephone** : ----  
**Project** : WA\_0960\_PFASOMP  
**Order number** : DEF19009/0960  
**C-O-C number** : 30679  
**Sampler** : [REDACTED]  
**Site** : DEF19009/Learmonth  
**Quote number** : SY/139/19  
**No. of samples received** : 16  
**No. of samples analysed** : 16

**Page** : 1 of 16  
**Laboratory** : Environmental Division Perth  
**Contact** : Customer Services EP  
**Address** : 26 Rigali Way Wangara WA Australia 6065  
**Telephone** : +61-8-9406 1301  
**Date Samples Received** : 29-Nov-2021 11:30  
**Date Analysis Commenced** : 02-Dec-2021  
**Issue Date** : 08-Dec-2021 12:33



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           |
|------------------------------------------------------------------------|----------------------------|----------------------------------|
| <span style="background-color: black; color: black;">[REDACTED]</span> | Laboratory Manager (Perth) | Perth Inorganics, Wangara, WA    |
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator           | Sydney Organics, Smithfield, NSW |



## 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.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- EP231X: Positive results for various analytes on sample EP2114471\_009 has been confirmed by re-extraction and re-analysis.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                        |             |      |       | 0960_MW141_5-5.5_2<br>11125 | 0960_MW140_3.5-4_2<br>11125 | 0960_MW181_3.5-4_2<br>11125 | 0960_MW143_3-3.5_2<br>11125 | 0960_MW127_211125 |
|--------------------------------------------------------|-------------|------|-------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-------------------|
| Sampling date / time                                   |             |      |       | 25-Nov-2021 08:23           | 25-Nov-2021 09:33           | 25-Nov-2021 09:47           | 25-Nov-2021 10:56           | 25-Nov-2021 11:27 |
| Compound                                               | CAS Number  | LOR  | Unit  | EP2114471-003               | EP2114471-004               | EP2114471-005               | EP2114471-006               | EP2114471-007     |
|                                                        |             |      |       | Result                      | Result                      | Result                      | Result                      | Result            |
| <b>ED037P: Alkalinity by PC Titrator</b>               |             |      |       |                             |                             |                             |                             |                   |
| Hydroxide Alkalinity as CaCO3                          | DMO-210-001 | 1    | mg/L  | <1                          | <1                          | <1                          | <1                          | <1                |
| Carbonate Alkalinity as CaCO3                          | 3812-32-6   | 1    | mg/L  | <1                          | <1                          | <1                          | <1                          | <1                |
| Bicarbonate Alkalinity as CaCO3                        | 71-52-3     | 1    | mg/L  | 241                         | 198                         | 204                         | 148                         | 145               |
| Total Alkalinity as CaCO3                              | ----        | 1    | mg/L  | 241                         | 198                         | 204                         | 148                         | 145               |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b> |             |      |       |                             |                             |                             |                             |                   |
| Sulfate as SO4 - Turbidimetric                         | 14808-79-8  | 1    | mg/L  | 1880                        | 5520                        | 6310                        | 4870                        | 2520              |
| <b>ED045G: Chloride by Discrete Analyser</b>           |             |      |       |                             |                             |                             |                             |                   |
| Chloride                                               | 16887-00-6  | 1    | mg/L  | 12600                       | 39900                       | 42500                       | 31900                       | 25500             |
| <b>ED093F: Dissolved Major Cations</b>                 |             |      |       |                             |                             |                             |                             |                   |
| Calcium                                                | 7440-70-2   | 1    | mg/L  | 434                         | 806                         | 1040                        | 1040                        | 1060              |
| Magnesium                                              | 7439-95-4   | 1    | mg/L  | 1010                        | 2710                        | 2960                        | 2510                        | 1740              |
| Sodium                                                 | 7440-23-5   | 1    | mg/L  | 7620                        | 22200                       | 23800                       | 20800                       | 15200             |
| Potassium                                              | 7440-09-7   | 1    | mg/L  | 384                         | 1120                        | 1190                        | 936                         | 511               |
| <b>EN055: Ionic Balance</b>                            |             |      |       |                             |                             |                             |                             |                   |
| ∅ Total Anions                                         | ----        | 0.01 | meq/L | 399                         | 1240                        | 1330                        | 1000                        | 775               |
| ∅ Total Cations                                        | ----        | 0.01 | meq/L | 446                         | 1260                        | 1360                        | 1190                        | 870               |
| ∅ Ionic Balance                                        | ----        | 0.01 | %     | 5.52                        | 0.52                        | 1.00                        | 8.35                        | 5.81              |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>           |             |      |       |                             |                             |                             |                             |                   |
| 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             |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>         |             |      |       |                             |                             |                             |                             |                   |
| 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             |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_MW141_5-5.5_2<br>11125 | 0960_MW140_3.5-4_2<br>11125 | 0960_MW181_3.5-4_2<br>11125 | 0960_MW143_3-3.5_2<br>11125 | 0960_MW127_211125 |
|------------------------------------------------------------|-------------|------|------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-------------------|
| Sampling date / time                                       |             |      |      | 25-Nov-2021 08:23           | 25-Nov-2021 09:33           | 25-Nov-2021 09:47           | 25-Nov-2021 10:56           | 25-Nov-2021 11:27 |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2114471-003               | EP2114471-004               | EP2114471-005               | EP2114471-006               | EP2114471-007     |
|                                                            |             |      |      | Result                      | Result                      | Result                      | Result                      | Result            |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                             |                             |                             |                             |                   |
| 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 (PFTTrDA)                        | 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             |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                             |                             |                             |                             |                   |
| Perfluorooctane sulfonamide (FOSA)                         | 754-91-6    | 0.02 | µg/L | <0.02                       | <0.02                       | <0.02                       | <0.02                       | <0.02             |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)              | 31506-32-8  | 0.05 | µg/L | <0.05                       | <0.05                       | <0.05                       | <0.05                       | <0.05             |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)               | 4151-50-2   | 0.05 | µg/L | <0.05                       | <0.05                       | <0.05                       | <0.05                       | <0.05             |
| N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)       | 24448-09-7  | 0.05 | µg/L | <0.05                       | <0.05                       | <0.05                       | <0.05                       | <0.05             |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)        | 1691-99-2   | 0.05 | µg/L | <0.05                       | <0.05                       | <0.05                       | <0.05                       | <0.05             |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)  | 2355-31-9   | 0.02 | µg/L | <0.02                       | <0.02                       | <0.02                       | <0.02                       | <0.02             |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)   | 2991-50-6   | 0.02 | µg/L | <0.02                       | <0.02                       | <0.02                       | <0.02                       | <0.02             |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                             |                             |                             |                             |                   |
| 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             |





## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_MW141_5-5.5_2<br>11125 | 0960_MW140_3.5-4_2<br>11125 | 0960_MW181_3.5-4_2<br>11125 | 0960_MW143_3-3.5_2<br>11125 | 0960_MW127_211125 |
|---------------------------------------------------------------|--------------------|------|------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-------------------|
| Sampling date / time                                          |                    |      |      | 25-Nov-2021 08:23           | 25-Nov-2021 09:33           | 25-Nov-2021 09:47           | 25-Nov-2021 10:56           | 25-Nov-2021 11:27 |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2114471-003               | EP2114471-004               | EP2114471-005               | EP2114471-006               | EP2114471-007     |
|                                                               |                    |      |      | Result                      | Result                      | Result                      | Result                      | Result            |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                             |                             |                             |                             |                   |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05                       | <0.05                       | <0.05                       | <0.05                       | <0.05             |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                             |                             |                             |                             |                   |
| 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             |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                             |                             |                             |                             |                   |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 112                         | 106                         | 101                         | 106                         | 103               |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 115                         | 115                         | 115                         | 118                         | 119               |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                        |             |      |       | 0060_MW126_211125 | 0960_MW112_211125 | 0960_MW102_211125 | ----  | ----  |
|--------------------------------------------------------|-------------|------|-------|-------------------|-------------------|-------------------|-------|-------|
| Sampling date / time                                   |             |      |       | 25-Nov-2021 12:09 | 25-Nov-2021 12:10 | 25-Nov-2021 12:31 | ----  | ----  |
| Compound                                               | CAS Number  | LOR  | Unit  | EP2114471-008     | EP2114471-009     | EP2114471-010     | ----- | ----- |
|                                                        |             |      |       | Result            | Result            | Result            | ----  | ----  |
| <b>ED037P: Alkalinity by PC Titrator</b>               |             |      |       |                   |                   |                   |       |       |
| Hydroxide Alkalinity as CaCO3                          | DMO-210-001 | 1    | mg/L  | <1                | <1                | <1                | ----  | ----  |
| Carbonate Alkalinity as CaCO3                          | 3812-32-6   | 1    | mg/L  | <1                | <1                | <1                | ----  | ----  |
| Bicarbonate Alkalinity as CaCO3                        | 71-52-3     | 1    | mg/L  | 150               | 717               | 115               | ----  | ----  |
| Total Alkalinity as CaCO3                              | ----        | 1    | mg/L  | 150               | 717               | 115               | ----  | ----  |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b> |             |      |       |                   |                   |                   |       |       |
| Sulfate as SO4 - Turbidimetric                         | 14808-79-8  | 1    | mg/L  | 1930              | 1200              | 4200              | ----  | ----  |
| <b>ED045G: Chloride by Discrete Analyser</b>           |             |      |       |                   |                   |                   |       |       |
| Chloride                                               | 16887-00-6  | 1    | mg/L  | 20800             | 3080              | 36200             | ----  | ----  |
| <b>ED093F: Dissolved Major Cations</b>                 |             |      |       |                   |                   |                   |       |       |
| Calcium                                                | 7440-70-2   | 1    | mg/L  | 1060              | 114               | 1330              | ----  | ----  |
| Magnesium                                              | 7439-95-4   | 1    | mg/L  | 1510              | 156               | 2230              | ----  | ----  |
| Sodium                                                 | 7440-23-5   | 1    | mg/L  | 11700             | 2230              | 20000             | ----  | ----  |
| Potassium                                              | 7440-09-7   | 1    | mg/L  | 510               | 94                | 614               | ----  | ----  |
| <b>EN055: Ionic Balance</b>                            |             |      |       |                   |                   |                   |       |       |
| ∅ Total Anions                                         | ----        | 0.01 | meq/L | 630               | 126               | 1110              | ----  | ----  |
| ∅ Total Cations                                        | ----        | 0.01 | meq/L | 699               | 118               | 1140              | ----  | ----  |
| ∅ Ionic Balance                                        | ----        | 0.01 | %     | 5.21              | 3.38              | 1.10              | ----  | ----  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>           |             |      |       |                   |                   |                   |       |       |
| Perfluorobutane sulfonic acid (PFBS)                   | 375-73-5    | 0.02 | µg/L  | <0.02             | 0.04              | <0.02             | ----  | ----  |
| Perfluoropentane sulfonic acid (PFPeS)                 | 2706-91-4   | 0.02 | µg/L  | <0.02             | 0.04              | <0.02             | ----  | ----  |
| Perfluorohexane sulfonic acid (PFHxS)                  | 355-46-4    | 0.01 | µg/L  | <0.01             | 0.56              | <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             | 0.93              | <0.01             | ----  | ----  |
| Perfluorodecane sulfonic acid (PFDS)                   | 335-77-3    | 0.02 | µg/L  | <0.02             | <0.02             | <0.02             | ----  | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>         |             |      |       |                   |                   |                   |       |       |
| 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             | 0.11              | <0.02             | ----  | ----  |
| Perfluoroheptanoic acid (PFHpA)                        | 375-85-9    | 0.02 | µg/L  | <0.02             | <0.02             | <0.02             | ----  | ----  |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0060_MW126_211125 | 0960_MW112_211125 | 0960_MW102_211125 | ----  | ----  |
|------------------------------------------------------------|-------------|------|------|-------------------|-------------------|-------------------|-------|-------|
| Sampling date / time                                       |             |      |      | 25-Nov-2021 12:09 | 25-Nov-2021 12:10 | 25-Nov-2021 12:31 | ----  | ----  |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2114471-008     | EP2114471-009     | EP2114471-010     | ----- | ----- |
|                                                            |             |      |      | Result            | Result            | Result            | ----  | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                   |                   |                   |       |       |
| Perfluorooctanoic acid (PFOA)                              | 335-67-1    | 0.01 | µg/L | <0.01             | <b>0.02</b>       | <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             | ----  | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                   |                   |                   |       |       |
| 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             | ----  | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                   |                   |                   |       |       |
| 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             | ----  | ----  |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0060_MW126_211125 | 0960_MW112_211125 | 0960_MW102_211125 | ----  | ----  |
|---------------------------------------------------------------|--------------------|------|------|-------------------|-------------------|-------------------|-------|-------|
| Sampling date / time                                          |                    |      |      | 25-Nov-2021 12:09 | 25-Nov-2021 12:10 | 25-Nov-2021 12:31 | ----  | ----  |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2114471-008     | EP2114471-009     | EP2114471-010     | ----- | ----- |
|                                                               |                    |      |      | Result            | Result            | Result            | ----  | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                   |                   |                   |       |       |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | ----  | ----  |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                   |                   |                   |       |       |
| Sum of PFAS                                                   | ----               | 0.01 | µg/L | <0.01             | 1.70              | <0.01             | ----  | ----  |
| Sum of PFHxS and PFOS                                         | 355-46-4/1763-23-1 | 0.01 | µg/L | <0.01             | 1.49              | <0.01             | ----  | ----  |
| Sum of PFAS (WA DER List)                                     | ----               | 0.01 | µg/L | <0.01             | 1.66              | <0.01             | ----  | ----  |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                   |                   |                   |       |       |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 102               | 106               | 106               | ----  | ----  |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 117               | 115               | 118               | ----  | ----  |



## Analytical Results

Sub-Matrix: MARINE WATER  
 (Matrix: WATER)

Sample ID

|                                                                   |             |      |       | 0960_OTH107_21112<br>5 | 0960_OTH106_21112<br>5 | ----  | ----  | ----  |
|-------------------------------------------------------------------|-------------|------|-------|------------------------|------------------------|-------|-------|-------|
| Sampling date / time                                              |             |      |       | 25-Nov-2021 07:54      | 25-Nov-2021 08:05      | ----  | ----  | ----  |
| Compound                                                          | CAS Number  | LOR  | Unit  | EP2114471-001          | EP2114471-002          | ----- | ----- | ----- |
| Result                                                            |             |      |       | Result                 | Result                 | ----  | ----  | ----  |
| <b>ED037P: Alkalinity by PC Titrator</b>                          |             |      |       |                        |                        |       |       |       |
| Hydroxide Alkalinity as CaCO <sub>3</sub>                         | DMO-210-001 | 1    | mg/L  | <1                     | <1                     | ----  | ----  | ----  |
| Carbonate Alkalinity as CaCO <sub>3</sub>                         | 3812-32-6   | 1    | mg/L  | <1                     | <1                     | ----  | ----  | ----  |
| Bicarbonate Alkalinity as CaCO <sub>3</sub>                       | 71-52-3     | 1    | mg/L  | 120                    | 117                    | ----  | ----  | ----  |
| Total Alkalinity as CaCO <sub>3</sub>                             | ----        | 1    | mg/L  | 120                    | 117                    | ----  | ----  | ----  |
| <b>ED041G: Sulfate (Turbidimetric) as SO<sub>4</sub> 2- by DA</b> |             |      |       |                        |                        |       |       |       |
| Sulfate as SO <sub>4</sub> - Turbidimetric                        | 14808-79-8  | 1    | mg/L  | 2650                   | 2640                   | ----  | ----  | ----  |
| <b>ED045G: Chloride by Discrete Analyser</b>                      |             |      |       |                        |                        |       |       |       |
| Chloride                                                          | 16887-00-6  | 1    | mg/L  | 19400                  | 19200                  | ----  | ----  | ----  |
| <b>ED093F: Dissolved Major Cations</b>                            |             |      |       |                        |                        |       |       |       |
| Calcium                                                           | 7440-70-2   | 1    | mg/L  | 456                    | 470                    | ----  | ----  | ----  |
| Magnesium                                                         | 7439-95-4   | 1    | mg/L  | 1500                   | 1560                   | ----  | ----  | ----  |
| Sodium                                                            | 7440-23-5   | 1    | mg/L  | 11600                  | 12100                  | ----  | ----  | ----  |
| Potassium                                                         | 7440-09-7   | 1    | mg/L  | 588                    | 615                    | ----  | ----  | ----  |
| <b>EN055: Ionic Balance</b>                                       |             |      |       |                        |                        |       |       |       |
| ∅ Total Anions                                                    | ----        | 0.01 | meq/L | 605                    | 599                    | ----  | ----  | ----  |
| ∅ Total Cations                                                   | ----        | 0.01 | meq/L | 666                    | 694                    | ----  | ----  | ----  |
| ∅ Ionic Balance                                                   | ----        | 0.01 | %     | 4.80                   | 7.35                   | ----  | ----  | ----  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>                      |             |      |       |                        |                        |       |       |       |
| 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                  | ----  | ----  | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>                    |             |      |       |                        |                        |       |       |       |
| 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                  | ----  | ----  | ----  |





## Analytical Results

Sub-Matrix: MARINE WATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_OTH107_21112<br>5 | 0960_OTH106_21112<br>5 | ----  | ----  | ----  |
|------------------------------------------------------------|-------------|------|------|------------------------|------------------------|-------|-------|-------|
| Sampling date / time                                       |             |      |      | 25-Nov-2021 07:54      | 25-Nov-2021 08:05      | ----  | ----  | ----  |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2114471-001          | EP2114471-002          | ----- | ----- | ----- |
|                                                            |             |      |      | Result                 | Result                 | ----  | ----  | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                        |                        |       |       |       |
| 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 (PFTTrDA)                        | 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                  | ----  | ----  | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                        |                        |       |       |       |
| 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                  | ----  | ----  | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                        |                        |       |       |       |
| 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                  | ----  | ----  | ----  |



## Analytical Results

Sub-Matrix: MARINE WATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_OTH107_21112<br>5 | 0960_OTH106_21112<br>5 | ----  | ----  | ----  |
|---------------------------------------------------------------|--------------------|------|------|------------------------|------------------------|-------|-------|-------|
| Sampling date / time                                          |                    |      |      | 25-Nov-2021 07:54      | 25-Nov-2021 08:05      | ----  | ----  | ----  |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2114471-001          | EP2114471-002          | ----- | ----- | ----- |
| Result                                                        |                    |      |      | Result                 | Result                 | ----  | ----  | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                        |                        |       |       |       |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05                  | <0.05                  | ----  | ----  | ----  |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                        |                        |       |       |       |
| 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                  | ----  | ----  | ----  |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                        |                        |       |       |       |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 107                    | 100                    | ----  | ----  | ----  |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 119                    | 111                    | ----  | ----  | ----  |



## Analytical Results

Sub-Matrix: RINSATE  
 (Matrix: WATER)

Sample ID

| Sub-Matrix: RINSATE<br>(Matrix: WATER)        |            |      |      | Sample ID         | 0960_QC301_211125 | 0960_QC302_211125 | 0960_QC303_211125 | 0960_QC401_211125 | 0960_QC402_211125 |
|-----------------------------------------------|------------|------|------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                          |            |      |      | 25-Nov-2021 13:55 | 25-Nov-2021 13:55 | 25-Nov-2021 13:56 | 25-Nov-2021 13:58 | 25-Nov-2021 13:59 |                   |
| Compound                                      | CAS Number | LOR  | Unit | EP2114471-011     | EP2114471-012     | EP2114471-013     | EP2114471-014     | EP2114471-015     |                   |
|                                               |            |      |      | Result            | Result            | Result            | Result            | Result            |                   |
| EP231A: Perfluoroalkyl Sulfonic Acids         |            |      |      |                   |                   |                   |                   |                   |                   |
| Perfluorobutane sulfonic acid (PFBS)          | 375-73-5   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |                   |
| Perfluoropentane sulfonic acid (PFPeS)        | 2706-91-4  | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |                   |
| Perfluorohexane sulfonic acid (PFHxS)         | 355-46-4   | 0.01 | µg/L | <0.01             | <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: RINSATE  
 (Matrix: WATER)

Sample ID

|                                                           |                    |      |      | 0960_QC301_211125 | 0960_QC302_211125 | 0960_QC303_211125 | 0960_QC401_211125 | 0960_QC402_211125 |
|-----------------------------------------------------------|--------------------|------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                      |                    |      |      | 25-Nov-2021 13:55 | 25-Nov-2021 13:55 | 25-Nov-2021 13:56 | 25-Nov-2021 13:58 | 25-Nov-2021 13:59 |
| Compound                                                  | CAS Number         | LOR  | Unit | EP2114471-011     | EP2114471-012     | EP2114471-013     | EP2114471-014     | EP2114471-015     |
|                                                           |                    |      |      | Result            | Result            | Result            | Result            | Result            |
| <b>EP231C: Perfluoroalkyl Sulfonamides - Continued</b>    |                    |      |      |                   |                   |                   |                   |                   |
| 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             |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>         |                    |      |      |                   |                   |                   |                   |                   |
| 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             |
| <b>EP231P: PFAS Sums</b>                                  |                    |      |      |                   |                   |                   |                   |                   |
| 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             |
| <b>EP231S: PFAS Surrogate</b>                             |                    |      |      |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                 | ----               | 0.02 | %    | 108               | 108               | 107               | 103               | 106               |
| 13C8-PFOA                                                 | ----               | 0.02 | %    | 115               | 119               | 115               | 117               | 120               |



## Analytical Results

Sub-Matrix: RINSATE  
 (Matrix: WATER)

Sample ID

0960\_QC403\_211125

| Sampling date / time                           |            |      |      | 25-Nov-2021 14:00 | ----  | ----  | ----  | ----  |
|------------------------------------------------|------------|------|------|-------------------|-------|-------|-------|-------|
| Compound                                       | CAS Number | LOR  | Unit | EP2114471-016     | ----- | ----- | ----- | ----- |
| Result                                         |            |      |      | ----              | ----  | ----  | ----  | ----  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>   |            |      |      |                   |       |       |       |       |
| 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             | ----  | ----  | ----  | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b> |            |      |      |                   |       |       |       |       |
| 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             | ----  | ----  | ----  | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>     |            |      |      |                   |       |       |       |       |
| 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<br>(Matrix: WATER)                    |                    |      |      | Sample ID         | 0960_QC403_211125 | ----  | ----  | ----  | ----  |
| Sampling date / time                                      |                    |      |      | 25-Nov-2021 14:00 | ----              | ----  | ----  | ----  | ----  |
| Compound                                                  | CAS Number         | LOR  | Unit | EP2114471-016     | -----             | ----- | ----- | ----- | ----- |
| 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 | %    | 99.5              | ----              | ----  | ----  | ----  | ----  |
| 13C8-PFOA                                                 | ----               | 0.02 | %    | 104               | ----              | ----  | ----  | ----  | ----  |



## Surrogate Control Limits

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

| Sub-Matrix: MARINE WATER      |            | Recovery Limits (%) |      |
|-------------------------------|------------|---------------------|------|
| Compound                      | CAS Number | Low                 | High |
| <b>EP231S: PFAS Surrogate</b> |            |                     |      |
| 13C4-PFOS                     | ----       | 60                  | 120  |
| 13C8-PFOA                     | ----       | 60                  | 120  |

| Sub-Matrix: RINSATE           |            | Recovery Limits (%) |      |
|-------------------------------|------------|---------------------|------|
| Compound                      | CAS Number | Low                 | High |
| <b>EP231S: PFAS Surrogate</b> |            |                     |      |
| 13C4-PFOS                     | ----       | 60                  | 120  |
| 13C8-PFOA                     | ----       | 60                  | 120  |

## Inter-Laboratory Testing

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

|                                |                                                                          |                                |                                                  |
|--------------------------------|--------------------------------------------------------------------------|--------------------------------|--------------------------------------------------|
| <b>Work Order</b>              | <b>: EP2114471</b>                                                       | <b>Page</b>                    | <b>: 1 of 10</b>                                 |
| <b>Client</b>                  | <b>: CARDNO (WA) PTY LTD</b>                                             | <b>Laboratory</b>              | <b>: Environmental Division Perth</b>            |
| <b>Contact</b>                 | <b>: [REDACTED]</b>                                                      | <b>Contact</b>                 | <b>: Customer Services EP</b>                    |
| <b>Address</b>                 | <b>: 11 HARVEST TERRACE PO BOX 155<br/>WEST PERTH WA, AUSTRALIA 6006</b> | <b>Address</b>                 | <b>: 26 Rigali Way Wangara WA Australia 6065</b> |
| <b>Telephone</b>               | <b>: ----</b>                                                            | <b>Telephone</b>               | <b>: +61-8-9406 1301</b>                         |
| <b>Project</b>                 | <b>: WA_0960_PFASOMP</b>                                                 | <b>Date Samples Received</b>   | <b>: 29-Nov-2021</b>                             |
| <b>Order number</b>            | <b>: DEF19009/0960</b>                                                   | <b>Date Analysis Commenced</b> | <b>: 02-Dec-2021</b>                             |
| <b>C-O-C number</b>            | <b>: 30679</b>                                                           | <b>Issue Date</b>              | <b>: 08-Dec-2021</b>                             |
| <b>Sampler</b>                 | <b>: [REDACTED]</b>                                                      |                                |                                                  |
| <b>Site</b>                    | <b>: DEF19009/Learmonth</b>                                              |                                |                                                  |
| <b>Quote number</b>            | <b>: SY/139/19</b>                                                       |                                |                                                  |
| <b>No. of samples received</b> | <b>: 16</b>                                                              |                                |                                                  |
| <b>No. of samples analysed</b> | <b>: 16</b>                                                              |                                |                                                  |



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]         | Laboratory Manager (Perth) | Perth Inorganics, Wangara, WA    |
| [REDACTED]         | LCMS Coordinator           | Sydney Organics, Smithfield, NSW |



## 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**

| Sub-Matrix: WATER                                                 |                    |                                          |             | Laboratory Duplicate (DUP) Report |      |                 |                  |         |                    |
|-------------------------------------------------------------------|--------------------|------------------------------------------|-------------|-----------------------------------|------|-----------------|------------------|---------|--------------------|
| Laboratory sample ID                                              | Sample ID          | Method: Compound                         | CAS Number  | LOR                               | Unit | Original Result | Duplicate Result | RPD (%) | Acceptable RPD (%) |
| ED037P: Alkalinity by PC Titrator (QC Lot: 4055130)               |                    |                                          |             |                                   |      |                 |                  |         |                    |
| EP2114395-006                                                     | Anonymous          | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                    | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                    | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 386             | 383              | 0.7     | 0% - 20%           |
|                                                                   |                    | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 386             | 383              | 0.7     | 0% - 20%           |
| EP2114414-002                                                     | Anonymous          | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                    | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | 5               | 4                | 0.0     | No Limit           |
|                                                                   |                    | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 154             | 156              | 1.3     | 0% - 20%           |
|                                                                   |                    | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 159             | 161              | 1.2     | 0% - 20%           |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4044099) |                    |                                          |             |                                   |      |                 |                  |         |                    |
| EP2114471-001                                                     | 0960_OTH107_211125 | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 2650            | 2650             | 0.0     | 0% - 20%           |
| EP2114474-001                                                     | Anonymous          | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 3530            | 3560             | 0.8     | 0% - 20%           |
| ED045G: Chloride by Discrete Analyser (QC Lot: 4044098)           |                    |                                          |             |                                   |      |                 |                  |         |                    |
| EP2114471-001                                                     | 0960_OTH107_211125 | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 19400           | 19200            | 1.3     | 0% - 20%           |
| EP2114474-001                                                     | Anonymous          | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 21100           | 21000            | 0.7     | 0% - 20%           |
| ED093F: Dissolved Major Cations (QC Lot: 4045345)                 |                    |                                          |             |                                   |      |                 |                  |         |                    |
| EP2114471-001                                                     | 0960_OTH107_211125 | ED093F: Calcium                          | 7440-70-2   | 1                                 | mg/L | 456             | 471              | 3.2     | 0% - 20%           |
|                                                                   |                    | ED093F: Magnesium                        | 7439-95-4   | 1                                 | mg/L | 1500            | 1540             | 3.1     | 0% - 20%           |
|                                                                   |                    | ED093F: Sodium                           | 7440-23-5   | 1                                 | mg/L | 11600           | 12000            | 2.9     | 0% - 20%           |
|                                                                   |                    | ED093F: Potassium                        | 7440-09-7   | 1                                 | mg/L | 588             | 606              | 3.0     | 0% - 20%           |
| EP2114473-001                                                     | Anonymous          | ED093F: Calcium                          | 7440-70-2   | 1                                 | mg/L | 487             | 471              | 3.4     | 0% - 20%           |
|                                                                   |                    | ED093F: Magnesium                        | 7439-95-4   | 1                                 | mg/L | 1570            | 1530             | 3.0     | 0% - 20%           |
|                                                                   |                    | ED093F: Sodium                           | 7440-23-5   | 1                                 | mg/L | 12300           | 11800            | 4.3     | 0% - 20%           |
|                                                                   |                    | ED093F: Potassium                        | 7440-09-7   | 1                                 | mg/L | 618             | 600              | 3.0     | 0% - 20%           |



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: 4053512)   |                             |                                                |            |                                   |      |                 |                  |         |                    |
| EP2114471-004                                             | 0960_MW140_3.5-4_21112<br>5 | EP231X: Perfluorohexane sulfonic acid (PFHxS)  | 355-46-4   | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
|                                                           |                             | EP231X: Perfluorooctane sulfonic acid (PFOS)   | 1763-23-1  | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
|                                                           |                             | EP231X: Perfluorobutane sulfonic acid (PFBS)   | 375-73-5   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |                             | EP231X: Perfluoropentane sulfonic acid (PFPeS) | 2706-91-4  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |                             | EP231X: Perfluoroheptane sulfonic acid (PFHpS) | 375-92-8   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |                             | EP231X: Perfluorodecane sulfonic acid (PFDS)   | 335-77-3   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
| EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4053879)   |                             |                                                |            |                                   |      |                 |                  |         |                    |
| EP2114474-001                                             | 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           |
| EP2114474-008                                             | Anonymous                   | EP231X: Perfluorohexane sulfonic acid (PFHxS)  | 355-46-4   | 0.01                              | µg/L | 0.05            | 0.07             | 23.4    | 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 | 0.06            | 0.08             | 28.7    | 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: 4053512) |                             |                                                |            |                                   |      |                 |                  |         |                    |
| EP2114471-004                                             | 0960_MW140_3.5-4_21112<br>5 | EP231X: Perfluorooctanoic acid (PFOA)          | 335-67-1   | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
|                                                           |                             | EP231X: Perfluoropentanoic acid (PFPeA)        | 2706-90-3  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |                             | EP231X: Perfluorohexanoic acid (PFHxA)         | 307-24-4   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |                             | EP231X: Perfluoroheptanoic acid (PFHpA)        | 375-85-9   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |                             | EP231X: Perfluorononanoic acid (PFNA)          | 375-95-1   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |                             | EP231X: Perfluorodecanoic acid (PFDA)          | 335-76-2   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |                             | EP231X: Perfluoroundecanoic acid (PFUnDA)      | 2058-94-8  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |                             | EP231X: Perfluorododecanoic acid (PFDoDA)      | 307-55-1   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |                             | EP231X: Perfluorotridecanoic acid (PFTrDA)     | 72629-94-8 | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |                             | EP231X: Perfluorotetradecanoic acid (PFTeDA)   | 376-06-7   | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                           |                             | EP231X: Perfluorobutanoic acid (PFBA)          | 375-22-4   | 0.1                               | µg/L | <0.1            | <0.1             | 0.0     | No Limit           |
| EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4053879) |                             |                                                |            |                                   |      |                 |                  |         |                    |
| EP2114474-001                                             | 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           |





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 (%) |
| EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4053879) - continued |                             |                                                                   |            |                                   |      |                 |                  |         |                    |
| EP2114474-001                                                         | Anonymous                   | EP231X: Perfluoroundecanoic acid (PFUnDA)                         | 2058-94-8  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |                             | EP231X: Perfluorododecanoic acid (PFDoDA)                         | 307-55-1   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |                             | EP231X: Perfluorotridecanoic acid (PFTrDA)                        | 72629-94-8 | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |                             | EP231X: Perfluorotetradecanoic acid (PFTeDA)                      | 376-06-7   | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                       |                             | EP231X: Perfluorobutanoic acid (PFBA)                             | 375-22-4   | 0.1                               | µg/L | <0.1            | <0.1             | 0.0     | No Limit           |
| EP2114474-008                                                         | Anonymous                   | EP231X: Perfluorooctanoic acid (PFOA)                             | 335-67-1   | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
|                                                                       |                             | EP231X: Perfluoropentanoic acid (PFPeA)                           | 2706-90-3  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |                             | EP231X: Perfluorohexanoic acid (PFHxA)                            | 307-24-4   | 0.02                              | µg/L | <0.02           | <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: 4053512)             |            |                                   |      |                 |                  |         |                    |
| EP2114471-004                                                         | 0960_MW140_3.5-4_21112<br>5 | 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: 4053879)                 |                             |                                                                   |            |                                   |      |                 |                  |         |                    |
| EP2114474-001                                                         | 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**

| Sub-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: 4053879) - continued |                         |                                                                   |             |                                   |      |                 |                  |         |                    |
| EP2114474-001                                                     | 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           |
| EP2114474-008                                                     | Anonymous               | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                   |                         | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                   |                         | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                   |                         | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |                         | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |                         | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |                         | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |                         | EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4053512)      |             |                                   |      |                 |                  |         |                    |
| EP2114471-004                                                     | 0960_MW140_3.5-4_211125 | 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: 4053879)      |                         |                                                                   |             |                                   |      |                 |                  |         |                    |
| EP2114474-001                                                     | 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           |
| EP2114474-008                                                     | Anonymous               | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |                         | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 27619-97-2  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |                         | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | 39108-34-4  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |

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 Work Order : EP2114471  
 Client : CARDNO (WA) PTY LTD  
 Project : WA\_0960\_PFASOMP



Sub-Matrix: **WATER**

|                                                                                 |                         |                                                     |             | Laboratory Duplicate (DUP) Report |      |                 |                  |         |                    |
|---------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------|-------------|-----------------------------------|------|-----------------|------------------|---------|--------------------|
| Laboratory sample ID                                                            | Sample ID               | Method: Compound                                    | CAS Number  | LOR                               | Unit | Original Result | Duplicate Result | RPD (%) | Acceptable RPD (%) |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4053879) - continued</b> |                         |                                                     |             |                                   |      |                 |                  |         |                    |
| EP2114474-008                                                                   | Anonymous               | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS) | 120226-60-0 | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
| <b>EP231P: PFAS Sums (QC Lot: 4053512)</b>                                      |                         |                                                     |             |                                   |      |                 |                  |         |                    |
| EP2114471-004                                                                   | 0960_MW140_3.5-4_211125 | EP231X: Sum of PFAS                                 | ----        | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
| <b>EP231P: PFAS Sums (QC Lot: 4053879)</b>                                      |                         |                                                     |             |                                   |      |                 |                  |         |                    |
| EP2114474-001                                                                   | Anonymous               | EP231X: Sum of PFAS                                 | ----        | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
| EP2114474-008                                                                   | Anonymous               | EP231X: Sum of PFAS                                 | ----        | 0.01                              | µg/L | 0.11            | 0.17             | 42.9    | 0% - 50%           |



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

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

Sub-Matrix: **WATER**

| Sub-Matrix: WATER                                                |                 |      |      | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |      |
|------------------------------------------------------------------|-----------------|------|------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|------|
|                                                                  |                 |      |      |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |      |
| Method: Compound                                                 | CAS Number      | LOR  | Unit | Result                      |                                       |                           |                                   |      |
| ED037P: Alkalinity by PC Titrator (QCLot: 4055130)               |                 |      |      |                             |                                       |                           |                                   |      |
| ED037-P: Hydroxide Alkalinity as CaCO3                           | DMO-210-00<br>1 | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Carbonate Alkalinity as CaCO3                           | 3812-32-6       | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Bicarbonate Alkalinity as CaCO3                         | 71-52-3         | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Total Alkalinity as CaCO3                               | ----            | 1    | mg/L | <1                          | 20 mg/L                               | 102                       | 81.2                              | 126  |
|                                                                  |                 |      |      | <1                          | 200 mg/L                              | 101                       | 90.0                              | 110  |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4044099) |                 |      |      |                             |                                       |                           |                                   |      |
| ED041G: Sulfate as SO4 - Turbidimetric                           | 14808-79-8      | 1    | mg/L | <1                          | 25 mg/L                               | 103                       | 87.7                              | 113  |
|                                                                  |                 |      |      | <1                          | 500 mg/L                              | 107                       | 87.7                              | 113  |
| ED045G: Chloride by Discrete Analyser (QCLot: 4044098)           |                 |      |      |                             |                                       |                           |                                   |      |
| ED045G: Chloride                                                 | 16887-00-6      | 1    | mg/L | <1                          | 10 mg/L                               | 106                       | 87.9                              | 114  |
|                                                                  |                 |      |      | <1                          | 1000 mg/L                             | 107                       | 87.9                              | 114  |
| ED093F: Dissolved Major Cations (QCLot: 4045345)                 |                 |      |      |                             |                                       |                           |                                   |      |
| ED093F: Calcium                                                  | 7440-70-2       | 1    | mg/L | <1                          | 50 mg/L                               | 103                       | 85.9                              | 113  |
| ED093F: Magnesium                                                | 7439-95-4       | 1    | mg/L | <1                          | 50 mg/L                               | 105                       | 88.0                              | 110  |
| ED093F: Sodium                                                   | 7440-23-5       | 1    | mg/L | <1                          | 50 mg/L                               | 108                       | 87.3                              | 118  |
| ED093F: Potassium                                                | 7440-09-7       | 1    | mg/L | <1                          | 50 mg/L                               | 94.8                      | 89.7                              | 108  |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4053512)           |                 |      |      |                             |                                       |                           |                                   |      |
| EP231X: Perfluorobutane sulfonic acid (PFBS)                     | 375-73-5        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 120                       | 72.0                              | 130  |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)                   | 2706-91-4       | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 127                       | 71.0                              | 127  |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)                    | 355-46-4        | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 125                       | 68.0                              | 131  |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)                   | 375-92-8        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 119                       | 69.0                              | 134  |
| EP231X: Perfluorooctane sulfonic acid (PFOS)                     | 1763-23-1       | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 124                       | 65.0                              | 140  |
| EP231X: Perfluorodecane sulfonic acid (PFDS)                     | 335-77-3        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 112                       | 53.0                              | 142  |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4053879)           |                 |      |      |                             |                                       |                           |                                   |      |
| EP231X: Perfluorobutane sulfonic acid (PFBS)                     | 375-73-5        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 100                       | 72.0                              | 130  |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)                   | 2706-91-4       | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 110                       | 71.0                              | 127  |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)                    | 355-46-4        | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 113                       | 68.0                              | 131  |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)                   | 375-92-8        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 103                       | 69.0                              | 134  |
| EP231X: Perfluorooctane sulfonic acid (PFOS)                     | 1763-23-1       | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 102                       | 65.0                              | 140  |
| EP231X: Perfluorodecane sulfonic acid (PFDS)                     | 335-77-3        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 69.8                      | 53.0                              | 142  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4053512)         |                 |      |      |                             |                                       |                           |                                   |      |
| 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                             | 125                       | 72.0                              | 129  |



Sub-Matrix: **WATER**

| Sub-Matrix: WATER                                                    |            |      |      | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |     |
|----------------------------------------------------------------------|------------|------|------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|-----|
|                                                                      |            |      |      |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |     |
| Method: Compound                                                     | CAS Number | LOR  | Unit | Result                      |                                       |                           |                                   |     |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4053512) - continued |            |      |      |                             |                                       |                           |                                   |     |
| EP231X: Perfluorohexanoic acid (PFHxA)                               | 307-24-4   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 128                       | 72.0                              | 129 |
| EP231X: Perfluoroheptanoic acid (PFHpA)                              | 375-85-9   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 122                       | 72.0                              | 130 |
| EP231X: Perfluorooctanoic acid (PFOA)                                | 335-67-1   | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 122                       | 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                             | 122                       | 71.0                              | 129 |
| EP231X: Perfluoroundecanoic acid (PFUnDA)                            | 2058-94-8  | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 112                       | 69.0                              | 133 |
| EP231X: Perfluorododecanoic acid (PFDoDA)                            | 307-55-1   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 123                       | 72.0                              | 134 |
| EP231X: Perfluorotridecanoic acid (PFTTrDA)                          | 72629-94-8 | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 118                       | 65.0                              | 144 |
| EP231X: Perfluorotetradecanoic acid (PFTeDA)                         | 376-06-7   | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 114                       | 71.0                              | 132 |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4053879)             |            |      |      |                             |                                       |                           |                                   |     |
| 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                             | 116                       | 72.0                              | 129 |
| EP231X: Perfluorohexanoic acid (PFHxA)                               | 307-24-4   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 106                       | 72.0                              | 129 |
| EP231X: Perfluoroheptanoic acid (PFHpA)                              | 375-85-9   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 125                       | 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                             | 105                       | 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                             | 84.4                      | 69.0                              | 133 |
| EP231X: Perfluorododecanoic acid (PFDoDA)                            | 307-55-1   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 123                       | 72.0                              | 134 |
| EP231X: Perfluorotridecanoic acid (PFTTrDA)                          | 72629-94-8 | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 67.8                      | 65.0                              | 144 |
| EP231X: Perfluorotetradecanoic acid (PFTeDA)                         | 376-06-7   | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 124                       | 71.0                              | 132 |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4053512)                 |            |      |      |                             |                                       |                           |                                   |     |
| EP231X: Perfluorooctane sulfonamide (FOSA)                           | 754-91-6   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 119                       | 67.0                              | 137 |
| EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)                | 31506-32-8 | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 74.1                      | 68.0                              | 141 |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)                 | 4151-50-2  | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 85.9                      | 62.6                              | 147 |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)         | 24448-09-7 | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 97.3                      | 66.0                              | 145 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)          | 1691-99-2  | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 113                       | 57.6                              | 145 |
| EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)    | 2355-31-9  | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 133                       | 65.0                              | 136 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)     | 2991-50-6  | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 127                       | 61.0                              | 135 |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4053879)                 |            |      |      |                             |                                       |                           |                                   |     |
| EP231X: Perfluorooctane sulfonamide (FOSA)                           | 754-91-6   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 116                       | 67.0                              | 137 |
| EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)                | 31506-32-8 | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 131                       | 68.0                              | 141 |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)                 | 4151-50-2  | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 104                       | 62.6                              | 147 |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)         | 24448-09-7 | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 134                       | 66.0                              | 145 |







Sub-Matrix: **WATER**

| 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: 4053879) - continued |           |                                                                   |             |                          |                  |                       |      |
| EP2114474-003                                                        | Anonymous | EP231X: Perfluorobutanoic acid (PFBA)                             | 375-22-4    | 1.25 µg/L                | 101              | 73.0                  | 129  |
|                                                                      |           | EP231X: Perfluoropentanoic acid (PFPeA)                           | 2706-90-3   | 0.25 µg/L                | 107              | 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                | 112              | 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                | 95.4             | 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                | 87.2             | 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                | 99.4             | 65.0                  | 144  |
|                                                                      |           | EP231X: Perfluorotetradecanoic acid (PFTeDA)                      | 376-06-7    | 0.625 µg/L               | 118              | 71.0                  | 132  |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4053879)                 |           |                                                                   |             |                          |                  |                       |      |
| EP2114474-003                                                        | Anonymous | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.25 µg/L                | 106              | 67.0                  | 137  |
|                                                                      |           | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.625 µg/L               | 129              | 68.0                  | 141  |
|                                                                      |           | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.625 µg/L               | 106              | 62.6                  | 147  |
|                                                                      |           | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.625 µg/L               | 118              | 66.0                  | 145  |
|                                                                      |           | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.625 µg/L               | 110              | 57.6                  | 145  |
|                                                                      |           | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9   | 0.25 µg/L                | 111              | 65.0                  | 136  |
|                                                                      |           | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.25 µg/L                | 86.6             | 61.0                  | 135  |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4053879)          |           |                                                                   |             |                          |                  |                       |      |
| EP2114474-003                                                        | Anonymous | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.25 µg/L                | 94.2             | 63.0                  | 143  |
|                                                                      |           | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 27619-97-2  | 0.25 µg/L                | 95.6             | 64.0                  | 140  |
|                                                                      |           | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | 39108-34-4  | 0.25 µg/L                | 116              | 67.0                  | 138  |
|                                                                      |           | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | 120226-60-0 | 0.25 µg/L                | 143              | 71.4                  | 144  |

## QA/QC Compliance Assessment to assist with Quality Review

Work Order : EP2114471

Page : 1 of 7

Client : CARDNO (WA) PTY LTD  
Contact :   
Project : WA\_0960\_PFASOMP  
Site : DEF19009/Learmonth  
Sampler :   
Order number : DEF19009/0960

Laboratory : Environmental Division Perth  
Telephone : +61-8-9406 1301  
Date Samples Received : 29-Nov-2021  
Issue Date : 08-Dec-2021  
No. of samples received : 16  
No. of samples analysed : 16

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

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

### Summary of Outliers

#### Outliers : Quality Control Samples

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

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

Page : 2 of 7  
 Work Order : EP2114471  
 Client : CARDNO (WA) PTY LTD  
 Project : WA\_0960\_PPFASOMP



### 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                                                                               |
|-------------------------------------------------------------|----------------------|--------------------|--------------------------------------------|------------|----------------|--------|---------------------------------------------------------------------------------------|
| <b>Matrix Spike (MS) Recoveries</b>                         |                      |                    |                                            |            |                |        |                                                                                       |
| ED041G: Sulfate (Turbidimetric) as SO <sub>4</sub> 2- by DA | EP2114471--001       | 0960_OTH107_211125 | Sulfate as SO <sub>4</sub> - Turbidimetric | 14808-79-8 | Not Determined | ----   | MS recovery not determined, background level greater than or equal to 4x spike level. |
| ED045G: Chloride by Discrete Analyser                       | EP2114471--001       | 0960_OTH107_211125 | Chloride                                   | 16887-00-6 | Not Determined | ----   | MS recovery not determined, background level greater than or equal to 4x spike level. |

### Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

| Quality Control Sample Type                          | Count |         | Rate (%) |          | Quality Control Specification  |
|------------------------------------------------------|-------|---------|----------|----------|--------------------------------|
| Method                                               | QC    | Regular | Actual   | Expected |                                |
| <b>Laboratory Duplicates (DUP)</b>                   |       |         |          |          |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | 3     | 38      | 7.89     | 10.00    | NEPM 2013 B3 & ALS QC Standard |
| <b>Matrix Spikes (MS)</b>                            |       |         |          |          |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | 1     | 38      | 2.63     | 5.00     | NEPM 2013 B3 & ALS QC Standard |

## Analysis Holding Time Compliance

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

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

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

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

Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                   |                          | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |
|------------------------------------------|--------------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|
| Container / Client Sample ID(s)          |                          |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| ED037P: Alkalinity by PC Titrator        |                          |             |                          |                    |            |               |                  |            |
| Clear Plastic Bottle - Natural (ED037-P) |                          | 25-Nov-2021 | ----                     | ----               | ----       | 04-Dec-2021   | 09-Dec-2021      | ✔          |
| 0960_OTH107_211125,                      | 0960_OTH106_211125,      |             |                          |                    |            |               |                  |            |
| 0960_MW141_5-5.5_211125,                 | 0960_MW140_3.5-4_211125, |             |                          |                    |            |               |                  |            |
| 0960_MW181_3.5-4_211125,                 | 0960_MW143_3-3.5_211125, |             |                          |                    |            |               |                  |            |
| 0960_MW127_211125,                       | 0060_MW126_211125,       |             |                          |                    |            |               |                  |            |
| 0960_MW112_211125,                       | 0960_MW102_211125        |             |                          |                    |            |               |                  |            |



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                                                                                                                                                                   |                                                                                                                                                                     | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|
| Container / Client Sample ID(s)                                                                                                                                                          |                                                                                                                                                                     |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA                                                                                                                                          |                                                                                                                                                                     |             |                          |                    |            |               |                  |            |
| Clear Plastic Bottle - Natural (ED041G)                                                                                                                                                  |                                                                                                                                                                     |             |                          |                    |            |               |                  |            |
| 0960_OTH107_211125,<br>0960_MW141_5-5.5_211125,<br>0960_MW181_3.5-4_211125,<br>0960_MW127_211125,<br>0960_MW112_211125,                                                                  | 0960_OTH106_211125,<br>0960_MW140_3.5-4_211125,<br>0960_MW143_3-3.5_211125,<br>0060_MW126_211125,<br>0960_MW102_211125                                              | 25-Nov-2021 | ----                     | ----               | ----       | 06-Dec-2021   | 23-Dec-2021      | ✓          |
| ED045G: Chloride by Discrete Analyser                                                                                                                                                    |                                                                                                                                                                     |             |                          |                    |            |               |                  |            |
| Clear Plastic Bottle - Natural (ED045G)                                                                                                                                                  |                                                                                                                                                                     |             |                          |                    |            |               |                  |            |
| 0960_OTH107_211125,<br>0960_MW141_5-5.5_211125,<br>0960_MW181_3.5-4_211125,<br>0960_MW127_211125,<br>0960_MW112_211125,                                                                  | 0960_OTH106_211125,<br>0960_MW140_3.5-4_211125,<br>0960_MW143_3-3.5_211125,<br>0060_MW126_211125,<br>0960_MW102_211125                                              | 25-Nov-2021 | ----                     | ----               | ----       | 06-Dec-2021   | 23-Dec-2021      | ✓          |
| ED093F: Dissolved Major Cations                                                                                                                                                          |                                                                                                                                                                     |             |                          |                    |            |               |                  |            |
| Clear Plastic Bottle - Natural (ED093F)                                                                                                                                                  |                                                                                                                                                                     |             |                          |                    |            |               |                  |            |
| 0960_OTH107_211125,<br>0960_MW141_5-5.5_211125,<br>0960_MW181_3.5-4_211125,<br>0960_MW127_211125,<br>0960_MW112_211125,                                                                  | 0960_OTH106_211125,<br>0960_MW140_3.5-4_211125,<br>0960_MW143_3-3.5_211125,<br>0060_MW126_211125,<br>0960_MW102_211125                                              | 25-Nov-2021 | ----                     | ----               | ----       | 02-Dec-2021   | 02-Dec-2021      | ✓          |
| EP231A: Perfluoroalkyl Sulfonic Acids                                                                                                                                                    |                                                                                                                                                                     |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                                                                                                                                                                  |                                                                                                                                                                     |             |                          |                    |            |               |                  |            |
| 0960_OTH107_211125,<br>0960_MW141_5-5.5_211125,<br>0960_MW181_3.5-4_211125,<br>0960_MW127_211125,<br>0960_MW112_211125,<br>0960_QC301_211125,<br>0960_QC303_211125,<br>0960_QC402_211125 | 0960_OTH106_211125,<br>0960_MW140_3.5-4_211125,<br>0960_MW143_3-3.5_211125,<br>0060_MW126_211125,<br>0960_MW102_211125,<br>0960_QC302_211125,<br>0960_QC401_211125, | 25-Nov-2021 | 03-Dec-2021              | 24-May-2022        | ✓          | 06-Dec-2021   | 24-May-2022      | ✓          |
| HDPE (no PTFE) (EP231X)                                                                                                                                                                  |                                                                                                                                                                     |             |                          |                    |            |               |                  |            |
| 0960_QC403_211125                                                                                                                                                                        |                                                                                                                                                                     | 25-Nov-2021 | 06-Dec-2021              | 24-May-2022        | ✓          | 07-Dec-2021   | 24-May-2022      | ✓          |



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                                                                                                                                                                                              |                                                                                                                                                                     | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|
| Container / Client Sample ID(s)                                                                                                                                                                                     |                                                                                                                                                                     |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| EP231B: Perfluoroalkyl Carboxylic Acids                                                                                                                                                                             |                                                                                                                                                                     |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)<br>0960_OTH107_211125,<br>0960_MW141_5-5.5_211125,<br>0960_MW181_3.5-4_211125,<br>0960_MW127_211125,<br>0960_MW112_211125,<br>0960_QC301_211125,<br>0960_QC303_211125,<br>0960_QC402_211125 | 0960_OTH106_211125,<br>0960_MW140_3.5-4_211125,<br>0960_MW143_3-3.5_211125,<br>0060_MW126_211125,<br>0960_MW102_211125,<br>0960_QC302_211125,<br>0960_QC401_211125, | 25-Nov-2021 | 03-Dec-2021              | 24-May-2022        | ✔          | 06-Dec-2021   | 24-May-2022      | ✔          |
| HDPE (no PTFE) (EP231X)<br>0960_QC403_211125                                                                                                                                                                        |                                                                                                                                                                     | 25-Nov-2021 | 06-Dec-2021              | 24-May-2022        | ✔          | 07-Dec-2021   | 24-May-2022      | ✔          |
| EP231C: Perfluoroalkyl Sulfonamides                                                                                                                                                                                 |                                                                                                                                                                     |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)<br>0960_OTH107_211125,<br>0960_MW141_5-5.5_211125,<br>0960_MW181_3.5-4_211125,<br>0960_MW127_211125,<br>0960_MW112_211125,<br>0960_QC301_211125,<br>0960_QC303_211125,<br>0960_QC402_211125 | 0960_OTH106_211125,<br>0960_MW140_3.5-4_211125,<br>0960_MW143_3-3.5_211125,<br>0060_MW126_211125,<br>0960_MW102_211125,<br>0960_QC302_211125,<br>0960_QC401_211125, | 25-Nov-2021 | 03-Dec-2021              | 24-May-2022        | ✔          | 06-Dec-2021   | 24-May-2022      | ✔          |
| HDPE (no PTFE) (EP231X)<br>0960_QC403_211125                                                                                                                                                                        |                                                                                                                                                                     | 25-Nov-2021 | 06-Dec-2021              | 24-May-2022        | ✔          | 07-Dec-2021   | 24-May-2022      | ✔          |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids                                                                                                                                                                          |                                                                                                                                                                     |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)<br>0960_OTH107_211125,<br>0960_MW141_5-5.5_211125,<br>0960_MW181_3.5-4_211125,<br>0960_MW127_211125,<br>0960_MW112_211125,<br>0960_QC301_211125,<br>0960_QC303_211125,<br>0960_QC402_211125 | 0960_OTH106_211125,<br>0960_MW140_3.5-4_211125,<br>0960_MW143_3-3.5_211125,<br>0060_MW126_211125,<br>0960_MW102_211125,<br>0960_QC302_211125,<br>0960_QC401_211125, | 25-Nov-2021 | 03-Dec-2021              | 24-May-2022        | ✔          | 06-Dec-2021   | 24-May-2022      | ✔          |
| HDPE (no PTFE) (EP231X)<br>0960_QC403_211125                                                                                                                                                                        |                                                                                                                                                                     | 25-Nov-2021 | 06-Dec-2021              | 24-May-2022        | ✔          | 07-Dec-2021   | 24-May-2022      | ✔          |





Matrix: WATER

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                                                                                                                                                                                              | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|--|
| Container / Client Sample ID(s)                                                                                                                                                                                     |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |  |
| EP231P: PFAS Sums                                                                                                                                                                                                   |             |                          |                    |            |               |                  |            |  |
| HDPE (no PTFE) (EP231X)<br>0960_OTH107_211125,<br>0960_MW141_5-5.5_211125,<br>0960_MW181_3.5-4_211125,<br>0960_MW127_211125,<br>0960_MW112_211125,<br>0960_QC301_211125,<br>0960_QC303_211125,<br>0960_QC402_211125 | 25-Nov-2021 | 03-Dec-2021              | 24-May-2022        | ✔          | 06-Dec-2021   | 24-May-2022      | ✔          |  |
| HDPE (no PTFE) (EP231X)<br>0960_QC403_211125                                                                                                                                                                        | 25-Nov-2021 | 06-Dec-2021              | 24-May-2022        | ✔          | 07-Dec-2021   | 24-May-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                            |         | Count |         | Rate (%) |          | Quality Control Specification |                                |
|--------------------------------------------------------|---------|-------|---------|----------|----------|-------------------------------|--------------------------------|
| Analytical Methods                                     | Method  | QC    | Regular | Actual   | Expected |                               | Evaluation                     |
|                                                        |         |       |         |          |          |                               |                                |
| Laboratory Duplicates (DUP)                            |         |       |         |          |          |                               |                                |
| Alkalinity by PC Titrator                              | ED037-P | 2     | 20      | 10.00    | 10.00    | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 2     | 19      | 10.53    | 10.00    | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 2     | 19      | 10.53    | 10.00    | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 3     | 38      | 7.89     | 10.00    | ✗                             | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 2     | 19      | 10.53    | 10.00    | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Laboratory Control Samples (LCS)                       |         |       |         |          |          |                               |                                |
| Alkalinity by PC Titrator                              | ED037-P | 2     | 20      | 10.00    | 10.00    | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 2     | 19      | 10.53    | 10.00    | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 1     | 19      | 5.26     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 2     | 38      | 5.26     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 2     | 19      | 10.53    | 10.00    | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Method Blanks (MB)                                     |         |       |         |          |          |                               |                                |
| Alkalinity by PC Titrator                              | ED037-P | 1     | 20      | 5.00     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 1     | 19      | 5.26     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 1     | 19      | 5.26     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 2     | 38      | 5.26     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 1     | 19      | 5.26     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Matrix Spikes (MS)                                     |         |       |         |          |          |                               |                                |
| Chloride by Discrete Analyser                          | ED045G  | 1     | 19      | 5.26     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 38      | 2.63     | 5.00     | ✗                             | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 1     | 19      | 5.26     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |



## Brief Method Summaries

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

| Analytical Methods                                                 | Method       | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------------------|--------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alkalinity by PC Titrator                                          | ED037-P      | WATER  | In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                                                                                                                                                                                                                |
| Sulfate (Turbidimetric) as SO <sub>4</sub> 2- by Discrete Analyser | ED041G       | WATER  | In house: Referenced to APHA 4500-SO <sub>4</sub> . Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO <sub>4</sub> suspension is measured by a photometer and the SO <sub>4</sub> -2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                         |
| Chloride by Discrete Analyser                                      | ED045G       | WATER  | In house: Referenced to APHA 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA seal method 2 017-1-L                                                                                                                                                                                                                                                                                                                                      |
| Major Cations - Dissolved                                          | ED093F       | WATER  | In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                           |
| Ionic Balance by PCT DA and Turbi SO <sub>4</sub> DA               | * EN055 - PG | WATER  | In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS               | EP231X       | WATER  | In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements. |
| Preparation Methods                                                | Method       | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Solid Phase Extraction (SPE) for PFAS in water                     | ORG72        | WATER  | In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.                                                                                                                                                                                                |

**CHAIN OF CUSTODY**

COC#: 30680

ALS Laboratory: EP Perth

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: MB\_DEF19009/Learmonth SED

ORDER NO: DEF19009/0960

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

SAMPLER MOBILE:

/ ES2019CARBSD0002

**LABORATORY USE ONLY (Circle)**

Custody Seal intact?

Yes 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 | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|------------|-------------|------------------------|--------|----------------------|---------|--------------------|----------------------|------------------------|
| 001    | 0960_SD208 |             | 25/11/2021<br>08:36 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 002    | 0960_SD205 |             | 25/11/2021<br>08:57 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 003    | 0960_SS301 |             | 25/11/2021<br>09:14 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 004    | 0960_SS298 |             | 25/11/2021<br>10:01 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |

**CHAIN OF CUSTODY**

COC#: 30680

ALS Laboratory: EP Perth

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: MB\_DEF19009/Learmonth SED

ORDER NO: DEF19009/0960

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

SAMPLER MOBILE:

/ ES2019CARBSD0002

**LABORATORY USE ONLY (Circle)**

Custody Seal intact?

Yes 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    | 0960_SD208  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 002    | 0960_SD205  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 003    | 0960_SS301  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 004    | 0960_SS298  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |

**CHAIN OF CUSTODY**

COC#: 30680

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: MB\_DEF19009/Learmonth SED

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:

/ ES2019CARBSD0002

**LABORATORY USE ONLY (Circle)**

Custody Seal intact? Yes 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    | 0960_SD208  | HDPE Soil Jar | 200 mL | 00620719069266 | Grey | No       |        |
| 002    | 0960_SD205  | HDPE Soil Jar | 200 mL | 00621019097720 | Grey | No       |        |
| 003    | 0960_SS301  | HDPE Soil Jar | 200 mL | 00620719069363 | Grey | No       |        |
| 004    | 0960_SS298  | HDPE Soil Jar | 200 mL | 00620719063179 | Grey | No       |        |

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



## SAMPLE RECEIPT NOTIFICATION (SRN)

**Work Order : EP2114472**

|                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Client : <b>CARDNO (WA) PTY LTD</b></p> <p>Contact : [REDACTED]</p> <p>Address : 11 HARVEST TERRACE PO BOX 155<br/>WEST PERTH WA, AUSTRALIA 6006</p> <p>E-mail : [REDACTED]@cardno.com.au</p> <p>Telephone : ----</p> <p>Facsimile : ----</p> <p>Project : WA_0960_PFASOMP</p> <p>Order number : DEF19009/0960</p> <p>C-O-C number : 30680</p> <p>Site : DEF19009/Learmonth</p> <p>Sampler : [REDACTED]</p> | <p>Laboratory : Environmental Division Perth</p> <p>Contact : Customer Services EP</p> <p>Address : 26 Rigali Way Wangara WA Australia<br/>6065</p> <p>E-mail : ALSEnviro.Perth@alsglobal.com</p> <p>Telephone : +61-8-9406 1301</p> <p>Facsimile : +61-8-9406 1399</p> <p>Page : 1 of 2</p> <p>Quote number : ES2019CARBSD0002 (SY/139/19)</p> <p>QC Level : NEPM 2013 B3 &amp; ALS QC Standard</p> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Dates

|                                           |                                               |
|-------------------------------------------|-----------------------------------------------|
| Date Samples Received : 29-Nov-2021 11:30 | Issue Date : 29-Nov-2021                      |
| Client Requested Due Date : 08-Dec-2021   | Scheduled Reporting Date : <b>08-Dec-2021</b> |

### Delivery Details

|                            |                                            |
|----------------------------|--------------------------------------------|
| Mode of Delivery : Carrier | Security Seal : Not Available              |
| No. of coolers/boxes : 2   | Temperature : 23.1 - Ice present           |
| Receipt Detail :           | No. of samples received / analysed : 4 / 4 |

### General Comments

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



## Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exists.

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: SOIL

| Laboratory sample ID | Sampling date / time | Sample ID         | SOIL - EA055-103 Moisture Content | SOIL - EP231X (solids) PFAS - Full Suite (28 analytes) |
|----------------------|----------------------|-------------------|-----------------------------------|--------------------------------------------------------|
| EP2114472-001        | 25-Nov-2021 08:36    | 0960_SD208_211125 | ✓                                 | ✓                                                      |
| EP2114472-002        | 25-Nov-2021 08:57    | 0960_SD205_211125 | ✓                                 | ✓                                                      |
| EP2114472-003        | 25-Nov-2021 09:14    | 0960_SS301_211125 | ✓                                 | ✓                                                      |
| EP2114472-004        | 25-Nov-2021 10:01    | 0960_SS298_211125 | ✓                                 | ✓                                                      |

## Proactive Holding Time Report

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

## Requested Deliverables

|                                                                                                                  |       |                              |
|------------------------------------------------------------------------------------------------------------------|-------|------------------------------|
| <ul style="list-style-type: none"> <li>- A4 - AU Tax Invoice (INV)</li> </ul>                                    | Email | cardno.com.au                |
| <b>DERP LAB REPORTS</b>                                                                                          |       |                              |
| <ul style="list-style-type: none"> <li>- EDI Format - ESDAT (ESDAT)</li> </ul>                                   | Email | derp.labreports@esdat.com.au |
| <ul style="list-style-type: none"> <li>- *AU Certificate of Analysis - NATA (COA)</li> </ul>                     | Email | cardno.com.au                |
| <ul style="list-style-type: none"> <li>- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)</li> </ul>    | Email | cardno.com.au                |
| <ul style="list-style-type: none"> <li>- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)</li> </ul>            | Email | cardno.com.au                |
| <ul style="list-style-type: none"> <li>- A4 - AU Sample Receipt Notification - Environmental HT (SRN)</li> </ul> | Email | cardno.com.au                |
| <ul style="list-style-type: none"> <li>- Chain of Custody (CoC) (COC)</li> </ul>                                 | Email | cardno.com.au                |
| <ul style="list-style-type: none"> <li>- EDI Format - ESDAT (ESDAT)</li> </ul>                                   | Email | cardno.com.au                |
| <ul style="list-style-type: none"> <li>- EDI Format - XTab (XTAB)</li> </ul>                                     | Email | cardno.com.au                |
| <b>Perth</b>                                                                                                     |       |                              |
| <ul style="list-style-type: none"> <li>- A4 - AU Tax Invoice (INV)</li> </ul>                                    | Email | perth@cardno.com.au          |

## CERTIFICATE OF ANALYSIS

**Work Order** : **EP2114472**  
**Client** : **CARDNO (WA) PTY LTD**  
**Contact** : [REDACTED]  
**Address** : 11 HARVEST TERRACE PO BOX 155  
 WEST PERTH WA, AUSTRALIA 6006  
**Telephone** : ----  
**Project** : WA\_0960\_PFASOMP  
**Order number** : DEF19009/0960  
**C-O-C number** : 30680  
**Sampler** : [REDACTED]  
**Site** : DEF19009/Learmonth  
**Quote number** : SY/139/19  
**No. of samples received** : 4  
**No. of samples analysed** : 4

**Page** : 1 of 5  
**Laboratory** : Environmental Division Perth  
**Contact** : Customer Services EP  
**Address** : 26 Rigali Way Wangara WA Australia 6065  
**Telephone** : +61-8-9406 1301  
**Date Samples Received** : 29-Nov-2021 11:30  
**Date Analysis Commenced** : 03-Dec-2021  
**Issue Date** : 08-Dec-2021 09:58



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>      |
|------------------------------------------------------------------------|------------------|------------------------------------|
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator | Sydney Inorganics, Smithfield, NSW |
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator | Sydney Organics, Smithfield, NSW   |



## 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.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- 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

|                                                    |            |        |       | 0960_SD208_211125 | 0960_SD205_211125 | 0960_SS301_211125 | 0960_SS298_211125 | ----  |
|----------------------------------------------------|------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------|
| Sampling date / time                               |            |        |       | 25-Nov-2021 08:36 | 25-Nov-2021 08:57 | 25-Nov-2021 09:14 | 25-Nov-2021 10:01 | ----  |
| Compound                                           | CAS Number | LOR    | Unit  | EP2114472-001     | EP2114472-002     | EP2114472-003     | EP2114472-004     | ----- |
|                                                    |            |        |       | Result            | Result            | Result            | Result            | ----  |
| <b>EA055: Moisture Content (Dried @ 105-110°C)</b> |            |        |       |                   |                   |                   |                   |       |
| Moisture Content                                   | ----       | 0.1    | %     | 24.4              | 32.1              | 28.1              | 8.3               | ----  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>       |            |        |       |                   |                   |                   |                   |       |
| Perfluorobutane sulfonic acid (PFBS)               | 375-73-5   | 0.0002 | mg/kg | <0.0002           | <0.0002           | <0.0002           | <0.0002           | ----  |
| Perfluoropentane sulfonic acid (PFPeS)             | 2706-91-4  | 0.0002 | mg/kg | <0.0002           | <0.0002           | <0.0002           | <0.0002           | ----  |
| Perfluorohexane sulfonic acid (PFHxS)              | 355-46-4   | 0.0002 | mg/kg | <0.0002           | <0.0002           | <0.0002           | <0.0002           | ----  |
| Perfluoroheptane sulfonic acid (PFHpS)             | 375-92-8   | 0.0002 | mg/kg | <0.0002           | <0.0002           | <0.0002           | <0.0002           | ----  |
| Perfluorooctane sulfonic acid (PFOS)               | 1763-23-1  | 0.0002 | mg/kg | <0.0002           | <0.0002           | <0.0002           | <0.0002           | ----  |
| Perfluorodecane sulfonic acid (PFDS)               | 335-77-3   | 0.0002 | mg/kg | <0.0002           | <0.0002           | <0.0002           | <0.0002           | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>     |            |        |       |                   |                   |                   |                   |       |
| 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           | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>         |            |        |       |                   |                   |                   |                   |       |
| 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

|                                                           |                    |        |       | 0960_SD208_211125 | 0960_SD205_211125 | 0960_SS301_211125 | 0960_SS298_211125 | ----  |
|-----------------------------------------------------------|--------------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------|
| Sampling date / time                                      |                    |        |       | 25-Nov-2021 08:36 | 25-Nov-2021 08:57 | 25-Nov-2021 09:14 | 25-Nov-2021 10:01 | ----  |
| Compound                                                  | CAS Number         | LOR    | Unit  | EP2114472-001     | EP2114472-002     | EP2114472-003     | EP2114472-004     | ----- |
|                                                           |                    |        |       | Result            | Result            | Result            | Result            | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides - Continued</b>    |                    |        |       |                   |                   |                   |                   |       |
| 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           | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>         |                    |        |       |                   |                   |                   |                   |       |
| 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           | ----  |
| <b>EP231P: PFAS Sums</b>                                  |                    |        |       |                   |                   |                   |                   |       |
| Sum of PFAS                                               | ----               | 0.0002 | mg/kg | <0.0002           | <0.0002           | <0.0002           | <0.0002           | ----  |
| Sum of PFHxS and PFOS                                     | 355-46-4/1763-23-1 | 0.0002 | mg/kg | <0.0002           | <0.0002           | <0.0002           | <0.0002           | ----  |
| Sum of PFAS (WA DER List)                                 | ----               | 0.0002 | mg/kg | <0.0002           | <0.0002           | <0.0002           | <0.0002           | ----  |
| <b>EP231S: PFAS Surrogate</b>                             |                    |        |       |                   |                   |                   |                   |       |
| 13C4-PFOS                                                 | ----               | 0.0002 | %     | 83.5              | 82.0              | 98.0              | 100               | ----  |
| 13C8-PFOA                                                 | ----               | 0.0002 | %     | 93.5              | 86.0              | 95.5              | 86.0              | ----  |





## Surrogate Control Limits

| Sub-Matrix: <b>SEDIMENT</b>   |            | Recovery Limits (%) |      |
|-------------------------------|------------|---------------------|------|
| Compound                      | CAS Number | Low                 | High |
| <b>EP231S: PFAS Surrogate</b> |            |                     |      |
| <b>13C4-PFOS</b>              | ----       | 60                  | 120  |
| <b>13C8-PFOA</b>              | ----       | 60                  | 120  |

## Inter-Laboratory Testing

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

## QUALITY CONTROL REPORT

|                                |                                                                          |                                |                                                  |
|--------------------------------|--------------------------------------------------------------------------|--------------------------------|--------------------------------------------------|
| <b>Work Order</b>              | <b>: EP2114472</b>                                                       | <b>Page</b>                    | <b>: 1 of 7</b>                                  |
| <b>Client</b>                  | <b>: CARDNO (WA) PTY LTD</b>                                             | <b>Laboratory</b>              | <b>: Environmental Division Perth</b>            |
| <b>Contact</b>                 | <b>: [REDACTED]</b>                                                      | <b>Contact</b>                 | <b>: Customer Services EP</b>                    |
| <b>Address</b>                 | <b>: 11 HARVEST TERRACE PO BOX 155<br/>WEST PERTH WA, AUSTRALIA 6006</b> | <b>Address</b>                 | <b>: 26 Rigali Way Wangara WA Australia 6065</b> |
| <b>Telephone</b>               | <b>: ----</b>                                                            | <b>Telephone</b>               | <b>: +61-8-9406 1301</b>                         |
| <b>Project</b>                 | <b>: WA_0960_PFASOMP</b>                                                 | <b>Date Samples Received</b>   | <b>: 29-Nov-2021</b>                             |
| <b>Order number</b>            | <b>: DEF19009/0960</b>                                                   | <b>Date Analysis Commenced</b> | <b>: 03-Dec-2021</b>                             |
| <b>C-O-C number</b>            | <b>: 30680</b>                                                           | <b>Issue Date</b>              | <b>: 08-Dec-2021</b>                             |
| <b>Sampler</b>                 | <b>: [REDACTED]</b>                                                      |                                |                                                  |
| <b>Site</b>                    | <b>: DEF19009/Learmonth</b>                                              |                                |                                                  |
| <b>Quote number</b>            | <b>: SY/139/19</b>                                                       |                                |                                                  |
| <b>No. of samples received</b> | <b>: 4</b>                                                               |                                |                                                  |
| <b>No. of samples analysed</b> | <b>: 4</b>                                                               |                                |                                                  |



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]         | LCMS Coordinator | Sydney Inorganics, Smithfield, NSW |
| [REDACTED]         | LCMS Coordinator | Sydney Organics, Smithfield, NSW   |



## 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**

| 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: 4056871) |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2114396-010                                                 | Anonymous         | EA055: Moisture Content                        | ----       | 0.1                               | %     | 22.9            | 23.3             | 1.9     | 0% - 20%           |
| EP2114475-001                                                 | Anonymous         | EA055: Moisture Content                        | ----       | 0.1                               | %     | 11.0            | 10.8             | 1.5     | 0% - 20%           |
| EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4052758)       |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2114396-008                                                 | 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           |
| EP2114472-002                                                 | 0960_SD205_211125 | 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: 4052758)     |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2114396-008                                                 | 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           |



| 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: 4052758) - continued |                   |                                                                   |            |                                   |       |                 |                  |         |                    |
| EP2114396-008                                                         | 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           |
| EP2114472-002                                                         | 0960_SD205_211125 | 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: 4052758)                 |                   |                                                                   |            |                                   |       |                 |                  |         |                    |
| EP2114396-008                                                         | 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           |
| EP2114472-002                                                         | 0960_SD205_211125 | 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           |

Page : 4 of 7  
 Work Order : EP2114472  
 Client : CARDNO (WA) PTY LTD  
 Project : WA\_0960\_PFASOMP



| Sub-Matrix: <b>SOIL</b>                                             |                   |                                                     |             | Laboratory Duplicate (DUP) Report |       |                 |                  |         |                    |
|---------------------------------------------------------------------|-------------------|-----------------------------------------------------|-------------|-----------------------------------|-------|-----------------|------------------|---------|--------------------|
| Laboratory sample ID                                                | Sample ID         | Method: Compound                                    | CAS Number  | LOR                               | Unit  | Original Result | Duplicate Result | RPD (%) | Acceptable RPD (%) |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4052758)</b> |                   |                                                     |             |                                   |       |                 |                  |         |                    |
| EP2114396-008                                                       | 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           |
| EP2114472-002                                                       | 0960_SD205_211125 | 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           |



## 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**

| Sub-Matrix: SOIL                                                  |             |        |       | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |     |
|-------------------------------------------------------------------|-------------|--------|-------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|-----|
|                                                                   |             |        |       |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |     |
| Method: Compound                                                  | CAS Number  | LOR    | Unit  | Result                      |                                       |                           |                                   |     |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4052758)            |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: Perfluorobutane sulfonic acid (PFBS)                      | 375-73-5    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 88.0                      | 72.0                              | 128 |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)                    | 2706-91-4   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 99.6                      | 73.0                              | 123 |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)                     | 355-46-4    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 99.6                      | 67.0                              | 130 |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)                    | 375-92-8    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 92.8                      | 70.0                              | 132 |
| EP231X: Perfluorooctane sulfonic acid (PFOS)                      | 1763-23-1   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 88.4                      | 68.0                              | 136 |
| EP231X: Perfluorodecane sulfonic acid (PFDS)                      | 335-77-3    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 90.4                      | 59.0                              | 134 |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4052758)          |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: Perfluorobutanoic acid (PFBA)                             | 375-22-4    | 0.001  | mg/kg | <0.001                      | 0.00625 mg/kg                         | 98.5                      | 71.0                              | 135 |
| EP231X: Perfluoropentanoic acid (PFPeA)                           | 2706-90-3   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 101                       | 69.0                              | 132 |
| EP231X: Perfluorohexanoic acid (PFHxA)                            | 307-24-4    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 104                       | 70.0                              | 132 |
| EP231X: Perfluoroheptanoic acid (PFHpA)                           | 375-85-9    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 108                       | 71.0                              | 131 |
| EP231X: Perfluorooctanoic acid (PFOA)                             | 335-67-1    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 104                       | 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                         | 99.6                      | 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                         | 101                       | 69.0                              | 135 |
| EP231X: Perfluorotridecanoic acid (PFTrDA)                        | 72629-94-8  | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 91.6                      | 66.0                              | 139 |
| EP231X: Perfluorotetradecanoic acid (PFTeDA)                      | 376-06-7    | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 112                       | 69.0                              | 133 |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4052758)              |             |        |       |                             |                                       |                           |                                   |     |
| 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                         | 114                       | 71.6                              | 129 |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 81.2                      | 69.8                              | 131 |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 104                       | 68.7                              | 130 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 110                       | 65.1                              | 134 |
| 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                         | 86.8                      | 61.0                              | 139 |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4052758)       |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.0005 | mg/kg | <0.0005                     | 0.00125 mg/kg                         | 111                       | 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                         | 108                       | 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                         | 117                       | 65.0                              | 137 |





| Sub-Matrix: SOIL                                                        |             |        |       | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                       |      |
|-------------------------------------------------------------------------|-------------|--------|-------|-----------------------------|---------------------------------------|---------------------------|-----------------------|------|
|                                                                         |             |        |       |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%) |      |
| Method: Compound                                                        | CAS Number  | LOR    | Unit  | Result                      |                                       |                           | Low                   | High |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4052758) - continued |             |        |       |                             |                                       |                           |                       |      |
| EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)                     | 120226-60-0 | 0.0005 | mg/kg | <0.0005                     | 0.00125 mg/kg                         | 101                       | 69.2                  | 143  |

## 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                                         |           |                                                                   |            | 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: 4052758)   |           |                                                                   |            |                          |                  |                       |      |
| EP2114396-008                                            | Anonymous | EP231X: Perfluorobutane sulfonic acid (PFBS)                      | 375-73-5   | 0.00125 mg/kg            | 91.6             | 72.0                  | 128  |
|                                                          |           | EP231X: Perfluoropentane sulfonic acid (PFPeS)                    | 2706-91-4  | 0.00125 mg/kg            | 107              | 73.0                  | 123  |
|                                                          |           | EP231X: Perfluorohexane sulfonic acid (PFHxS)                     | 355-46-4   | 0.00125 mg/kg            | 108              | 67.0                  | 130  |
|                                                          |           | EP231X: Perfluoroheptane sulfonic acid (PFHpS)                    | 375-92-8   | 0.00125 mg/kg            | 102              | 70.0                  | 132  |
|                                                          |           | EP231X: Perfluorooctane sulfonic acid (PFOS)                      | 1763-23-1  | 0.00125 mg/kg            | 102              | 68.0                  | 136  |
|                                                          |           | EP231X: Perfluorodecane sulfonic acid (PFDS)                      | 335-77-3   | 0.00125 mg/kg            | 103              | 59.0                  | 134  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4052758) |           |                                                                   |            |                          |                  |                       |      |
| EP2114396-008                                            | Anonymous | 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            | 119              | 69.0                  | 132  |
|                                                          |           | EP231X: Perfluorohexanoic acid (PFHxA)                            | 307-24-4   | 0.00125 mg/kg            | 118              | 70.0                  | 132  |
|                                                          |           | EP231X: Perfluoroheptanoic acid (PFHpA)                           | 375-85-9   | 0.00125 mg/kg            | 113              | 71.0                  | 131  |
|                                                          |           | EP231X: Perfluorooctanoic acid (PFOA)                             | 335-67-1   | 0.00125 mg/kg            | 114              | 69.0                  | 133  |
|                                                          |           | EP231X: Perfluorononanoic acid (PFNA)                             | 375-95-1   | 0.00125 mg/kg            | 106              | 72.0                  | 129  |
|                                                          |           | EP231X: Perfluorodecanoic acid (PFDA)                             | 335-76-2   | 0.00125 mg/kg            | 104              | 69.0                  | 133  |
|                                                          |           | EP231X: Perfluoroundecanoic acid (PFUnDA)                         | 2058-94-8  | 0.00125 mg/kg            | 96.8             | 64.0                  | 136  |
|                                                          |           | EP231X: Perfluorododecanoic acid (PFDoDA)                         | 307-55-1   | 0.00125 mg/kg            | 111              | 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            | 121              | 69.0                  | 133  |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4052758)     |           |                                                                   |            |                          |                  |                       |      |
| EP2114396-008                                            | Anonymous | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6   | 0.00125 mg/kg            | 107              | 67.0                  | 137  |
|                                                          |           | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8 | 0.00312 mg/kg            | 122              | 71.6                  | 129  |
|                                                          |           | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2  | 0.00312 mg/kg            | 106              | 69.8                  | 131  |
|                                                          |           | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7 | 0.00312 mg/kg            | 113              | 68.7                  | 130  |
|                                                          |           | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2  | 0.00312 mg/kg            | 118              | 65.1                  | 134  |
|                                                          |           | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9  | 0.00125 mg/kg            | 107              | 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: 4052758) - continued |           |                                                                  |             |                          |                  |                       |      |
| EP2114396-008                                                    | Anonymous | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA) | 2991-50-6   | 0.00125 mg/kg            | 100              | 61.0                  | 139  |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4052758)      |           |                                                                  |             |                          |                  |                       |      |
| EP2114396-008                                                    | Anonymous | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                | 757124-72-4 | 0.00125 mg/kg            | 119              | 62.0                  | 145  |
|                                                                  |           | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                | 27619-97-2  | 0.00125 mg/kg            | 129              | 64.0                  | 140  |
|                                                                  |           | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                | 39108-34-4  | 0.00125 mg/kg            | 126              | 65.0                  | 137  |
|                                                                  |           | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)              | 120226-60-0 | 0.00125 mg/kg            | 84.8             | 69.2                  | 143  |

## QA/QC Compliance Assessment to assist with Quality Review

Work Order : EP2114472

Page : 1 of 4

Client : CARDNO (WA) PTY LTD  
Contact :   
Project : WA\_0960\_PFASOMP  
Site : DEF19009/Learmonth  
Sampler :   
Order number : DEF19009/0960

Laboratory : Environmental Division Perth  
Telephone : +61-8-9406 1301  
Date Samples Received : 29-Nov-2021  
Issue Date : 08-Dec-2021  
No. of samples received : 4  
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                                                             | Sample Date                             | Extraction / Preparation |                    |             | Analysis      |                  |             |   |
|--------------------------------------------------------------------|-----------------------------------------|--------------------------|--------------------|-------------|---------------|------------------|-------------|---|
| Container / Client Sample ID(s)                                    |                                         | Date extracted           | Due for extraction | Evaluation  | Date analysed | Due for analysis | Evaluation  |   |
| EA055: Moisture Content (Dried @ 105-110°C)                        |                                         |                          |                    |             |               |                  |             |   |
| HDPE Soil Jar (EA055)<br>0960_SD208_211125,<br>0960_SS301_211125,  | 0960_SD205_211125,<br>0960_SS298_211125 | 25-Nov-2021              | ----               | ----        | ----          | 06-Dec-2021      | 09-Dec-2021 | ✓ |
| EP231A: Perfluoroalkyl Sulfonic Acids                              |                                         |                          |                    |             |               |                  |             |   |
| HDPE Soil Jar (EP231X)<br>0960_SD208_211125,<br>0960_SS301_211125, | 0960_SD205_211125,<br>0960_SS298_211125 | 25-Nov-2021              | 03-Dec-2021        | 24-May-2022 | ✓             | 07-Dec-2021      | 12-Jan-2022 | ✓ |
| EP231B: Perfluoroalkyl Carboxylic Acids                            |                                         |                          |                    |             |               |                  |             |   |
| HDPE Soil Jar (EP231X)<br>0960_SD208_211125,<br>0960_SS301_211125, | 0960_SD205_211125,<br>0960_SS298_211125 | 25-Nov-2021              | 03-Dec-2021        | 24-May-2022 | ✓             | 07-Dec-2021      | 12-Jan-2022 | ✓ |
| EP231C: Perfluoroalkyl Sulfonamides                                |                                         |                          |                    |             |               |                  |             |   |
| HDPE Soil Jar (EP231X)<br>0960_SD208_211125,<br>0960_SS301_211125, | 0960_SD205_211125,<br>0960_SS298_211125 | 25-Nov-2021              | 03-Dec-2021        | 24-May-2022 | ✓             | 07-Dec-2021      | 12-Jan-2022 | ✓ |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids                         |                                         |                          |                    |             |               |                  |             |   |
| HDPE Soil Jar (EP231X)<br>0960_SD208_211125,<br>0960_SS301_211125, | 0960_SD205_211125,<br>0960_SS298_211125 | 25-Nov-2021              | 03-Dec-2021        | 24-May-2022 | ✓             | 07-Dec-2021      | 12-Jan-2022 | ✓ |
| EP231P: PFAS Sums                                                  |                                         |                          |                    |             |               |                  |             |   |
| HDPE Soil Jar (EP231X)<br>0960_SD208_211125,<br>0960_SS301_211125, | 0960_SD205_211125,<br>0960_SS298_211125 | 25-Nov-2021              | 03-Dec-2021        | 24-May-2022 | ✓             | 07-Dec-2021      | 12-Jan-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                          |        | Count |         | Rate (%) |          |            | Quality Control Specification  |
|------------------------------------------------------|--------|-------|---------|----------|----------|------------|--------------------------------|
| Analytical Methods                                   | Method | QC    | Regular | Actual   | Expected | Evaluation |                                |
|                                                      |        |       |         |          |          |            |                                |
| Laboratory Duplicates (DUP)                          |        |       |         |          |          |            |                                |
| Moisture Content                                     | EA055  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 2     | 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.

| <i>Analytical Methods</i>                            | <i>Method</i> | <i>Matrix</i> | <i>Method Descriptions</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------------------------------|---------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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. |
| <i>Preparation Methods</i>                           | <i>Method</i> | <i>Matrix</i> | <i>Method Descriptions</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| QuEChERS Extraction of Solids                        | ORG71         | SOIL          | In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.                                                                                                                                                                                                                                   |





CHAIN OF CUSTODY

COC#: 30681 ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD  
PROJECT: WA\_0960\_PFSOMP  
SITE: MB\_DEF19009/Learmonth SW  
ORDER NO: DEF19009/0960  
PROJECT MANAGER:  
PRIMARY SAMPLER:  
EMAIL REPORTS TO:  
EMAIL INVOICES TO:

|                  |              |                  |              |
|------------------|--------------|------------------|--------------|
| RELINQUISHED BY: | RECEIVED BY: | RELINQUISHED BY: | RECEIVED BY: |
| DATE TIME:       | DATE TIME:   | DATE TIME:       | DATE TIME:   |

|                                    |                                                                                                                                                                                                 |
|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TURNAROUND REQUIREMENTS : 5 Days   | LABORATORY USE ONLY (Circle)<br>Custody Seal intact? Yes No N/A<br>Free ice / frozen ice bricks present upon receipt? Yes No N/A<br>Random Sample Temperature on Receipt: °C<br>Other comments: |
| Biohazard info:                    |                                                                                                                                                                                                 |
| SAMPLER MOBILE: / ES2019CARBSD0002 |                                                                                                                                                                                                 |

| SAMPLE DETAILS |            |             |                     |        |                      |         | ANALYSIS REQUIRED            |                      |                        |
|----------------|------------|-------------|---------------------|--------|----------------------|---------|------------------------------|----------------------|------------------------|
| SAMPLE         | NAME       | DESCRIPTION | DATE / TIME         | MATRIX | TOTAL BOTTLES        | ON HOLD | Surface Waters Primary WATER | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
| 001            | 0960_SW207 |             | 25/11/2021 08:36 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8                  |                      |                        |
| 002            | 0960_SW205 |             | 25/11/2021 08:57 AM | Water  | ALS: 2<br>Non ALS: 0 | No      | Partial 1/8                  |                      |                        |
| 003            | 0960_SW301 |             | 25/11/2021 09:14 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8                  |                      |                        |

**CHAIN OF CUSTODY**

COC#: 30681

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: MB\_DEF19009/Learmonth SW

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:

/ ES2019CARBSD0002

**LABORATORY USE ONLY (Circle)**

Custody Seal intact? Yes 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    | 0960_SW207  | Surface Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 002    | 0960_SW205  | Surface Waters Primary WATER | Water  | - EP231X PFAS - Full Suite (28 analytes)                                                                                                                                                                    |
| 003    | 0960_SW301  | Surface Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |



RECEIVED BY:

DATE TIME:

ORDER NO: DEF19009/0960

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

**LABORATORY USE ONLY (Circle)**

|                      |     |    |     |
|----------------------|-----|----|-----|
| Custody Seal intact? | Yes | No | N/A |
|----------------------|-----|----|-----|

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

Random Sample Temperature on Receipt: °C

Other comments:

PRIMARY SAMPLER:

SAMPLER MOBILE:  
/ ES2019CARBSD0002

EMAIL REPORTS TO:

EMAIL INVOICES TO:

| SAMPLE | SAMPLE NAME | BOTTLE NAME                    | VOLUME | BARCODE        | TYPE  | FILTERED | REASON |
|--------|-------------|--------------------------------|--------|----------------|-------|----------|--------|
| 001    | 0960_SW207  | Clear Plastic Bottle - Natural | 250 mL | 00070621191248 | Green | No       |        |
| 001    | 0960_SW207  | HDPE (no PTFE)                 | 20 mL  | 00352101071240 | Grey  | No       |        |
| 001    | 0960_SW207  | HDPE (no PTFE)                 | 20 mL  | 00352101070932 | Grey  | No       |        |
| 002    | 0960_SW205  | HDPE (no PTFE)                 | 20 mL  | 00352101071449 | Grey  | No       |        |
| 002    | 0960_SW205  | HDPE (no PTFE)                 | 20 mL  | 00352101071086 | Grey  | No       |        |
| 003    | 0960_SW301  | Clear Plastic Bottle - Natural | 250 mL | 00070621191123 | Green | No       |        |
| 003    | 0960_SW301  | HDPE (no PTFE)                 | 20 mL  | 00352101071507 | Grey  | No       |        |
| 003    | 0960_SW301  | HDPE (no PTFE)                 | 20 mL  | 00352101071349 | Grey  | No       |        |

**Total Bottle Count: ALS: 8, Non ALS: 0**

## SAMPLE RECEIPT NOTIFICATION (SRN)

**Work Order : EP2114473**

|                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Client : <b>CARDNO (WA) PTY LTD</b></p> <p>Contact : [REDACTED]</p> <p>Address : 11 HARVEST TERRACE PO BOX 155<br/>WEST PERTH WA, AUSTRALIA 6006</p> <p>E-mail : [REDACTED]@cardno.com.au</p> <p>Telephone : ----</p> <p>Facsimile : ----</p> <p>Project : WA_0960_PFASOMP</p> <p>Order number : DEF19009/0960</p> <p>C-O-C number : 30681</p> <p>Site : DEF19009/Learmonth</p> <p>Sampler : [REDACTED]</p> | <p>Laboratory : Environmental Division Perth</p> <p>Contact : Customer Services EP</p> <p>Address : 26 Rigali Way Wangara WA Australia<br/>6065</p> <p>E-mail : ALSEnviro.Perth@alsglobal.com</p> <p>Telephone : +61-8-9406 1301</p> <p>Facsimile : +61-8-9406 1399</p> <p>Page : 1 of 2</p> <p>Quote number : ES2019CARBSD0002 (SY/139/19)</p> <p>QC Level : NEPM 2013 B3 &amp; ALS QC Standard</p> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Dates

|                                           |                                               |
|-------------------------------------------|-----------------------------------------------|
| Date Samples Received : 29-Nov-2021 11:30 | Issue Date : 29-Nov-2021                      |
| Client Requested Due Date : 08-Dec-2021   | Scheduled Reporting Date : <b>08-Dec-2021</b> |

### Delivery Details

|                             |                                            |
|-----------------------------|--------------------------------------------|
| Mode of Delivery : Carrier  | Security Seal : Not Available              |
| No. of coolers/boxes : 2    | Temperature : 23.1 - Ice present           |
| Receipt Detail : Ice Melted | No. of samples received / analysed : 3 / 3 |

### General Comments

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



## Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exists.

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

| Laboratory sample ID | Sampling date / time | Sample ID         | WATER - EN055 - PG<br>Ionic Balance by ED037P, ED041G, ED045G &<br>WATER - EP231X<br>PFAS - Full Suite (28 analytes) | WATER - NT-01<br>Major Cations (Ca, Mg, Na, K) | WATER - NT-02<br>Major Anions (Chloride, Sulphate, Alkalinity) |
|----------------------|----------------------|-------------------|----------------------------------------------------------------------------------------------------------------------|------------------------------------------------|----------------------------------------------------------------|
| EP2114473-001        | 25-Nov-2021 08:36    | 0960_SW207_211125 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114473-002        | 25-Nov-2021 08:57    | 0960_SW205_211125 |                                                                                                                      | ✓                                              |                                                                |
| EP2114473-003        | 25-Nov-2021 09:14    | 0960_SW301_211125 | ✓                                                                                                                    | ✓                                              | ✓                                                              |

## Proactive Holding Time Report

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

## Requested Deliverables

|                                                                                                                  |       |                              |
|------------------------------------------------------------------------------------------------------------------|-------|------------------------------|
| <ul style="list-style-type: none"> <li>- A4 - AU Tax Invoice (INV)</li> </ul>                                    | Email | cardno.com.au                |
| <b>DERP LAB REPORTS</b>                                                                                          |       |                              |
| <ul style="list-style-type: none"> <li>- EDI Format - ESDAT (ESDAT)</li> </ul>                                   | Email | derp.labreports@esdat.com.au |
| <ul style="list-style-type: none"> <li>- *AU Certificate of Analysis - NATA (COA)</li> </ul>                     | Email | cardno.com.au                |
| <ul style="list-style-type: none"> <li>- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)</li> </ul>    | Email | cardno.com.au                |
| <ul style="list-style-type: none"> <li>- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)</li> </ul>            | Email | cardno.com.au                |
| <ul style="list-style-type: none"> <li>- A4 - AU Sample Receipt Notification - Environmental HT (SRN)</li> </ul> | Email | cardno.com.au                |
| <ul style="list-style-type: none"> <li>- Chain of Custody (CoC) (COC)</li> </ul>                                 | Email | cardno.com.au                |
| <ul style="list-style-type: none"> <li>- EDI Format - ESDAT (ESDAT)</li> </ul>                                   | Email | cardno.com.au                |
| <ul style="list-style-type: none"> <li>- EDI Format - XTab (XTAB)</li> </ul>                                     | Email | cardno.com.au                |
| <b>Perth</b>                                                                                                     |       |                              |
| <ul style="list-style-type: none"> <li>- A4 - AU Tax Invoice (INV)</li> </ul>                                    | Email | perth@cardno.com.au          |

## CERTIFICATE OF ANALYSIS

**Work Order** : **EP2114473**  
**Client** : **CARDNO (WA) PTY LTD**  
**Contact** : [REDACTED]  
**Address** : 11 HARVEST TERRACE PO BOX 155  
 WEST PERTH WA, AUSTRALIA 6006  
**Telephone** : ----  
**Project** : WA\_0960\_PFASOMP  
**Order number** : DEF19009/0960  
**C-O-C number** : 30681  
**Sampler** : [REDACTED]  
**Site** : DEF19009/Learmonth  
**Quote number** : SY/139/19  
**No. of samples received** : 3  
**No. of samples analysed** : 3

**Page** : 1 of 6  
**Laboratory** : Environmental Division Perth  
**Contact** : Customer Services EP  
**Address** : 26 Rigali Way Wangara WA Australia 6065  
**Telephone** : +61-8-9406 1301  
**Date Samples Received** : 29-Nov-2021 11:30  
**Date Analysis Commenced** : 30-Nov-2021  
**Issue Date** : 08-Dec-2021 13:00



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>    |
|------------------------------------------------------------------------|----------------------------|----------------------------------|
| <span style="background-color: black; color: black;">[REDACTED]</span> | Laboratory Manager (Perth) | Perth Inorganics, Wangara, WA    |
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator           | Sydney Organics, Smithfield, NSW |





## 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.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- 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.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, 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: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                        |             |      |       | 0960_SW207_211125 | 0960_SW205_211125 | 0960_SW301_211125 | ----  | ----  |
|--------------------------------------------------------|-------------|------|-------|-------------------|-------------------|-------------------|-------|-------|
| Sampling date / time                                   |             |      |       | 25-Nov-2021 08:36 | 25-Nov-2021 08:57 | 25-Nov-2021 09:14 | ----  | ----  |
| Compound                                               | CAS Number  | LOR  | Unit  | EP2114473-001     | EP2114473-002     | EP2114473-003     | ----- | ----- |
|                                                        |             |      |       | Result            | Result            | Result            | ----  | ----  |
| <b>ED037P: Alkalinity by PC Titrator</b>               |             |      |       |                   |                   |                   |       |       |
| Hydroxide Alkalinity as CaCO3                          | DMO-210-001 | 1    | mg/L  | <1                | ----              | <1                | ----  | ----  |
| Carbonate Alkalinity as CaCO3                          | 3812-32-6   | 1    | mg/L  | <1                | ----              | <1                | ----  | ----  |
| Bicarbonate Alkalinity as CaCO3                        | 71-52-3     | 1    | mg/L  | 138               | ----              | 186               | ----  | ----  |
| Total Alkalinity as CaCO3                              | ----        | 1    | mg/L  | 138               | ----              | 186               | ----  | ----  |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b> |             |      |       |                   |                   |                   |       |       |
| Sulfate as SO4 - Turbidimetric                         | 14808-79-8  | 1    | mg/L  | 2720              | ----              | 5190              | ----  | ----  |
| <b>ED045G: Chloride by Discrete Analyser</b>           |             |      |       |                   |                   |                   |       |       |
| Chloride                                               | 16887-00-6  | 1    | mg/L  | 19400             | ----              | 35900             | ----  | ----  |
| <b>ED093F: Dissolved Major Cations</b>                 |             |      |       |                   |                   |                   |       |       |
| Calcium                                                | 7440-70-2   | 1    | mg/L  | 487               | ----              | 707               | ----  | ----  |
| Magnesium                                              | 7439-95-4   | 1    | mg/L  | 1570              | ----              | 2560              | ----  | ----  |
| Sodium                                                 | 7440-23-5   | 1    | mg/L  | 12300             | ----              | 19400             | ----  | ----  |
| Potassium                                              | 7440-09-7   | 1    | mg/L  | 618               | ----              | 976               | ----  | ----  |
| <b>EN055: Ionic Balance</b>                            |             |      |       |                   |                   |                   |       |       |
| ∅ Total Anions                                         | ----        | 0.01 | meq/L | 607               | ----              | 1120              | ----  | ----  |
| ∅ Total Cations                                        | ----        | 0.01 | meq/L | 704               | ----              | 1110              | ----  | ----  |
| ∅ Ionic Balance                                        | ----        | 0.01 | %     | 7.45              | ----              | 0.43              | ----  | ----  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>           |             |      |       |                   |                   |                   |       |       |
| Perfluorobutane sulfonic acid (PFBS)                   | 375-73-5    | 0.02 | µg/L  | <0.02             | <0.02             | <0.02             | ----  | ----  |
| Perfluoropentane sulfonic acid (PFPeS)                 | 2706-91-4   | 0.02 | µg/L  | <0.02             | <0.02             | <0.02             | ----  | ----  |
| Perfluorohexane sulfonic acid (PFHxS)                  | 355-46-4    | 0.01 | µg/L  | <0.01             | <0.01             | <0.01             | ----  | ----  |
| Perfluoroheptane sulfonic acid (PFHpS)                 | 375-92-8    | 0.02 | µg/L  | <0.02             | <0.02             | <0.02             | ----  | ----  |
| Perfluorooctane sulfonic acid (PFOS)                   | 1763-23-1   | 0.01 | µg/L  | <0.01             | <0.01             | <0.01             | ----  | ----  |
| Perfluorodecane sulfonic acid (PFDS)                   | 335-77-3    | 0.02 | µg/L  | <0.02             | <0.02             | <0.02             | ----  | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>         |             |      |       |                   |                   |                   |       |       |
| 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             | ----  | ----  |



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_SW207_211125 | 0960_SW205_211125 | 0960_SW301_211125 | ----  | ----  |
|------------------------------------------------------------|-------------|------|------|-------------------|-------------------|-------------------|-------|-------|
| Sampling date / time                                       |             |      |      | 25-Nov-2021 08:36 | 25-Nov-2021 08:57 | 25-Nov-2021 09:14 | ----  | ----  |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2114473-001     | EP2114473-002     | EP2114473-003     | ----- | ----- |
|                                                            |             |      |      | Result            | Result            | Result            | ----  | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                   |                   |                   |       |       |
| 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             | ----  | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                   |                   |                   |       |       |
| 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             | ----  | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                   |                   |                   |       |       |
| 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             | ----  | ----  |



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_SW207_211125 | 0960_SW205_211125 | 0960_SW301_211125 | ----  | ----  |
|---------------------------------------------------------------|--------------------|------|------|-------------------|-------------------|-------------------|-------|-------|
| Sampling date / time                                          |                    |      |      | 25-Nov-2021 08:36 | 25-Nov-2021 08:57 | 25-Nov-2021 09:14 | ----  | ----  |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2114473-001     | EP2114473-002     | EP2114473-003     | ----- | ----- |
|                                                               |                    |      |      | Result            | Result            | Result            | ----  | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                   |                   |                   |       |       |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | ----  | ----  |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                   |                   |                   |       |       |
| 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             | ----  | ----  |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                   |                   |                   |       |       |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 102               | 101               | 107               | ----  | ----  |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 106               | 104               | 108               | ----  | ----  |

Page : 6 of 6  
Work Order : EP2114473  
Client : CARDNO (WA) PTY LTD  
Project : WA\_0960\_PFASOMP



## Surrogate Control Limits

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

## Inter-Laboratory Testing

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

|                                |                                                                          |                                |                                                  |
|--------------------------------|--------------------------------------------------------------------------|--------------------------------|--------------------------------------------------|
| <b>Work Order</b>              | <b>: EP2114473</b>                                                       | <b>Page</b>                    | <b>: 1 of 9</b>                                  |
| <b>Client</b>                  | <b>: CARDNO (WA) PTY LTD</b>                                             | <b>Laboratory</b>              | <b>: Environmental Division Perth</b>            |
| <b>Contact</b>                 | <b>: [REDACTED]</b>                                                      | <b>Contact</b>                 | <b>: Customer Services EP</b>                    |
| <b>Address</b>                 | <b>: 11 HARVEST TERRACE PO BOX 155<br/>WEST PERTH WA, AUSTRALIA 6006</b> | <b>Address</b>                 | <b>: 26 Rigali Way Wangara WA Australia 6065</b> |
| <b>Telephone</b>               | <b>: ----</b>                                                            | <b>Telephone</b>               | <b>: +61-8-9406 1301</b>                         |
| <b>Project</b>                 | <b>: WA_0960_PFASOMP</b>                                                 | <b>Date Samples Received</b>   | <b>: 29-Nov-2021</b>                             |
| <b>Order number</b>            | <b>: DEF19009/0960</b>                                                   | <b>Date Analysis Commenced</b> | <b>: 30-Nov-2021</b>                             |
| <b>C-O-C number</b>            | <b>: 30681</b>                                                           | <b>Issue Date</b>              | <b>: 08-Dec-2021</b>                             |
| <b>Sampler</b>                 | <b>: [REDACTED]</b>                                                      |                                |                                                  |
| <b>Site</b>                    | <b>: DEF19009/Learmonth</b>                                              |                                |                                                  |
| <b>Quote number</b>            | <b>: SY/139/19</b>                                                       |                                |                                                  |
| <b>No. of samples received</b> | <b>: 3</b>                                                               |                                |                                                  |
| <b>No. of samples analysed</b> | <b>: 3</b>                                                               |                                |                                                  |



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]         | Laboratory Manager (Perth) | Perth Inorganics, Wangara, WA    |
| [REDACTED]         | LCMS Coordinator           | Sydney Organics, Smithfield, NSW |





## 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**

| Sub-Matrix: WATER                                                 |                   |                                          |             | Laboratory Duplicate (DUP) Report |      |                 |                  |         |                    |
|-------------------------------------------------------------------|-------------------|------------------------------------------|-------------|-----------------------------------|------|-----------------|------------------|---------|--------------------|
| Laboratory sample ID                                              | Sample ID         | Method: Compound                         | CAS Number  | LOR                               | Unit | Original Result | Duplicate Result | RPD (%) | Acceptable RPD (%) |
| ED037P: Alkalinity by PC Titrator (QC Lot: 4055130)               |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2114395-006                                                     | Anonymous         | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 386             | 383              | 0.7     | 0% - 20%           |
|                                                                   |                   | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 386             | 383              | 0.7     | 0% - 20%           |
| EP2114414-002                                                     | Anonymous         | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | 5               | 4                | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 154             | 156              | 1.3     | 0% - 20%           |
|                                                                   |                   | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 159             | 161              | 1.2     | 0% - 20%           |
| ED037P: Alkalinity by PC Titrator (QC Lot: 4055133)               |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2114473-003                                                     | 0960_SW301_211125 | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 186             | 190              | 2.2     | 0% - 20%           |
|                                                                   |                   | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 186             | 190              | 2.2     | 0% - 20%           |
| EP2114590-001                                                     | Anonymous         | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 136             | 136              | 0.0     | 0% - 20%           |
|                                                                   |                   | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 136             | 136              | 0.0     | 0% - 20%           |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4043819) |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2114473-001                                                     | 0960_SW207_211125 | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 2720            | 2750             | 1.2     | 0% - 20%           |
| EP2114556-003                                                     | Anonymous         | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 32              | 32               | 0.0     | 0% - 20%           |
| ED045G: Chloride by Discrete Analyser (QC Lot: 4043818)           |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2114473-001                                                     | 0960_SW207_211125 | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 19400           | 19500            | 0.3     | 0% - 20%           |
| EP2114556-003                                                     | Anonymous         | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 57              | 58               | 0.0     | 0% - 20%           |



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 (%) |
| ED093F: Dissolved Major Cations (QC Lot: 4045345)         |                   |                                                |            |                                   |      |                 |                  |         |                    |
| EP2114471-001                                             | Anonymous         | ED093F: Calcium                                | 7440-70-2  | 1                                 | mg/L | 456             | 471              | 3.2     | 0% - 20%           |
|                                                           |                   | ED093F: Magnesium                              | 7439-95-4  | 1                                 | mg/L | 1500            | 1540             | 3.1     | 0% - 20%           |
|                                                           |                   | ED093F: Sodium                                 | 7440-23-5  | 1                                 | mg/L | 11600           | 12000            | 2.9     | 0% - 20%           |
|                                                           |                   | ED093F: Potassium                              | 7440-09-7  | 1                                 | mg/L | 588             | 606              | 3.0     | 0% - 20%           |
| EP2114473-001                                             | 0960_SW207_211125 | ED093F: Calcium                                | 7440-70-2  | 1                                 | mg/L | 487             | 471              | 3.4     | 0% - 20%           |
|                                                           |                   | ED093F: Magnesium                              | 7439-95-4  | 1                                 | mg/L | 1570            | 1530             | 3.0     | 0% - 20%           |
|                                                           |                   | ED093F: Sodium                                 | 7440-23-5  | 1                                 | mg/L | 12300           | 11800            | 4.3     | 0% - 20%           |
|                                                           |                   | ED093F: Potassium                              | 7440-09-7  | 1                                 | mg/L | 618             | 600              | 3.0     | 0% - 20%           |
| EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4053879)   |                   |                                                |            |                                   |      |                 |                  |         |                    |
| EP2114474-001                                             | 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           |
| EP2114474-008                                             | Anonymous         | EP231X: Perfluorohexane sulfonic acid (PFHxS)  | 355-46-4   | 0.01                              | µg/L | 0.05            | 0.07             | 23.4    | 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 | 0.06            | 0.08             | 28.7    | 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: 4053879) |                   |                                                |            |                                   |      |                 |                  |         |                    |
| EP2114474-001                                             | 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 (PFTeDA)     | 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           |
| EP2114474-008                                             | Anonymous         | EP231X: Perfluorooctanoic acid (PFOA)          | 335-67-1   | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
|                                                           |                   | EP231X: Perfluoropentanoic acid (PFPeA)        | 2706-90-3  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |                   | EP231X: Perfluorohexanoic acid (PFHxA)         | 307-24-4   | 0.02                              | µg/L | <0.02           | <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**

| Sub-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: 4053879) - continued |           |                                                                   |             |                                   |      |                 |                  |         |                    |
| EP2114474-008                                                         | Anonymous | 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 (PFTTeDA)                     | 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: 4053879)                 |           |                                                                   |             |                                   |      |                 |                  |         |                    |
| EP2114474-001                                                         | Anonymous | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |           | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |           | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |           | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                       |           | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                       |           | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                       |           | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
| EP2114474-008                                                         | Anonymous | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |           | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |           | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |           | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                       |           | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                       |           | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                       |           | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4053879)          |           |                                                                   |             |                                   |      |                 |                  |         |                    |
| EP2114474-001                                                         | 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           |

Page : 5 of 9  
 Work Order : EP2114473  
 Client : CARDNO (WA) PTY LTD  
 Project : WA\_0960\_PFASOMP



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 (%) |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4053879) - continued |           |                                                     |             |                                   |      |                 |                  |         |                    |
| EP2114474-008                                                            | Anonymous | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)   | 757124-72-4 | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                          |           | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)   | 27619-97-2  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                          |           | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)   | 39108-34-4  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                          |           | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS) | 120226-60-0 | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
| EP231P: PFAS Sums (QC Lot: 4053879)                                      |           |                                                     |             |                                   |      |                 |                  |         |                    |
| EP2114474-001                                                            | Anonymous | EP231X: Sum of PFAS                                 | ----        | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
| EP2114474-008                                                            | Anonymous | EP231X: Sum of PFAS                                 | ----        | 0.01                              | µg/L | 0.11            | 0.17             | 42.9    | 0% - 50%           |



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

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

Sub-Matrix: **WATER**

| Sub-Matrix: WATER                                                |                 |      |      | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |      |
|------------------------------------------------------------------|-----------------|------|------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|------|
|                                                                  |                 |      |      |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |      |
| Method: Compound                                                 | CAS Number      | LOR  | Unit | Result                      |                                       |                           |                                   |      |
| ED037P: Alkalinity by PC Titrator (QCLot: 4055130)               |                 |      |      |                             |                                       |                           |                                   |      |
| ED037-P: Hydroxide Alkalinity as CaCO3                           | DMO-210-00<br>1 | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Carbonate Alkalinity as CaCO3                           | 3812-32-6       | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Bicarbonate Alkalinity as CaCO3                         | 71-52-3         | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Total Alkalinity as CaCO3                               | ----            | 1    | mg/L | <1                          | 20 mg/L                               | 102                       | 81.2                              | 126  |
|                                                                  |                 |      |      | <1                          | 200 mg/L                              | 101                       | 90.0                              | 110  |
| ED037P: Alkalinity by PC Titrator (QCLot: 4055133)               |                 |      |      |                             |                                       |                           |                                   |      |
| ED037-P: Hydroxide Alkalinity as CaCO3                           | DMO-210-00<br>1 | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Carbonate Alkalinity as CaCO3                           | 3812-32-6       | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Bicarbonate Alkalinity as CaCO3                         | 71-52-3         | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Total Alkalinity as CaCO3                               | ----            | 1    | mg/L | <1                          | 20 mg/L                               | 104                       | 81.2                              | 126  |
|                                                                  |                 |      |      | <1                          | 200 mg/L                              | 102                       | 90.0                              | 110  |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4043819) |                 |      |      |                             |                                       |                           |                                   |      |
| ED041G: Sulfate as SO4 - Turbidimetric                           | 14808-79-8      | 1    | mg/L | <1                          | 25 mg/L                               | 101                       | 87.7                              | 113  |
|                                                                  |                 |      |      | <1                          | 500 mg/L                              | 106                       | 87.7                              | 113  |
| ED045G: Chloride by Discrete Analyser (QCLot: 4043818)           |                 |      |      |                             |                                       |                           |                                   |      |
| ED045G: Chloride                                                 | 16887-00-6      | 1    | mg/L | <1                          | 10 mg/L                               | 96.2                      | 87.9                              | 114  |
|                                                                  |                 |      |      | <1                          | 1000 mg/L                             | 102                       | 87.9                              | 114  |
| ED093F: Dissolved Major Cations (QCLot: 4045345)                 |                 |      |      |                             |                                       |                           |                                   |      |
| ED093F: Calcium                                                  | 7440-70-2       | 1    | mg/L | <1                          | 50 mg/L                               | 103                       | 85.9                              | 113  |
| ED093F: Magnesium                                                | 7439-95-4       | 1    | mg/L | <1                          | 50 mg/L                               | 105                       | 88.0                              | 110  |
| ED093F: Sodium                                                   | 7440-23-5       | 1    | mg/L | <1                          | 50 mg/L                               | 108                       | 87.3                              | 118  |
| ED093F: Potassium                                                | 7440-09-7       | 1    | mg/L | <1                          | 50 mg/L                               | 94.8                      | 89.7                              | 108  |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4053879)           |                 |      |      |                             |                                       |                           |                                   |      |
| EP231X: Perfluorobutane sulfonic acid (PFBS)                     | 375-73-5        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 100                       | 72.0                              | 130  |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)                   | 2706-91-4       | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 110                       | 71.0                              | 127  |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)                    | 355-46-4        | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 113                       | 68.0                              | 131  |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)                   | 375-92-8        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 103                       | 69.0                              | 134  |
| EP231X: Perfluorooctane sulfonic acid (PFOS)                     | 1763-23-1       | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 102                       | 65.0                              | 140  |
| EP231X: Perfluorodecane sulfonic acid (PFDS)                     | 335-77-3        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 69.8                      | 53.0                              | 142  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4053879)         |                 |      |      |                             |                                       |                           |                                   |      |
| 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                             | 116                       | 72.0                              | 129  |

### Method Blank (MB) Report

| Spike<br>Concentration | Spike Recovery (%) | Acceptable Limits (%) |      |
|------------------------|--------------------|-----------------------|------|
|                        | LCS                | Low                   | High |

## Matrix Spike (MS) Report

Sub-Matrix: **WATER**

| <i>Spike</i>         | <i>SpikeRecovery</i> (%) | <i>Acceptable Limits (%)</i> |             |
|----------------------|--------------------------|------------------------------|-------------|
| <i>Concentration</i> | <i>MS</i>                | <i>Low</i>                   | <i>High</i> |

| Laboratory sample ID                                             | Sample ID         | Method: Compound                       | CAS Number | Concentration | MS               | Low  | High |
|------------------------------------------------------------------|-------------------|----------------------------------------|------------|---------------|------------------|------|------|
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4043819) |                   |                                        |            |               |                  |      |      |
| EP2114473-001                                                    | 0960_SW207_211125 | ED041G: Sulfate as SO4 - Turbidimetric | 14808-79-8 | 100 mg/L      | # Not Determined | 70.0 | 130  |
| ED045G: Chloride by Discrete Analyser (QCLot: 4043818)           |                   |                                        |            |               |                  |      |      |





Sub-Matrix: **WATER**

| Sub-Matrix: WATER                                                  |                   |                                                                   |             | Matrix Spike (MS) Report |                  |                       |      |
|--------------------------------------------------------------------|-------------------|-------------------------------------------------------------------|-------------|--------------------------|------------------|-----------------------|------|
|                                                                    |                   |                                                                   |             | Spike                    | SpikeRecovery(%) | Acceptable Limits (%) |      |
| Laboratory sample ID                                               | Sample ID         | Method: Compound                                                  | CAS Number  | Concentration            | MS               | Low                   | High |
| ED045G: Chloride by Discrete Analyser (QCLot: 4043818) - continued |                   |                                                                   |             |                          |                  |                       |      |
| EP2114473-001                                                      | 0960_SW207_211125 | ED045G: Chloride                                                  | 16887-00-6  | 1000 mg/L                | # Not Determined | 70.0                  | 130  |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4053879)             |                   |                                                                   |             |                          |                  |                       |      |
| EP2114474-003                                                      | Anonymous         | EP231X: Perfluorobutane sulfonic acid (PFBS)                      | 375-73-5    | 0.25 µg/L                | 79.0             | 72.0                  | 130  |
|                                                                    |                   | EP231X: Perfluoropentane sulfonic acid (PFPeS)                    | 2706-91-4   | 0.25 µg/L                | 106              | 71.0                  | 127  |
|                                                                    |                   | EP231X: Perfluorohexane sulfonic acid (PFHxS)                     | 355-46-4    | 0.25 µg/L                | 101              | 68.0                  | 131  |
|                                                                    |                   | EP231X: Perfluoroheptane sulfonic acid (PFHpS)                    | 375-92-8    | 0.25 µg/L                | 91.4             | 69.0                  | 134  |
|                                                                    |                   | EP231X: Perfluorooctane sulfonic acid (PFOS)                      | 1763-23-1   | 0.25 µg/L                | 91.8             | 65.0                  | 140  |
|                                                                    |                   | EP231X: Perfluorodecane sulfonic acid (PFDS)                      | 335-77-3    | 0.25 µg/L                | 91.8             | 53.0                  | 142  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4053879)           |                   |                                                                   |             |                          |                  |                       |      |
| EP2114474-003                                                      | Anonymous         | EP231X: Perfluorobutanoic acid (PFBA)                             | 375-22-4    | 1.25 µg/L                | 101              | 73.0                  | 129  |
|                                                                    |                   | EP231X: Perfluoropentanoic acid (PFPeA)                           | 2706-90-3   | 0.25 µg/L                | 107              | 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                | 112              | 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                | 95.4             | 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                | 87.2             | 69.0                  | 133  |
|                                                                    |                   | EP231X: Perfluorododecanoic acid (PFDoDA)                         | 307-55-1    | 0.25 µg/L                | 106              | 72.0                  | 134  |
|                                                                    |                   | EP231X: Perfluorotridecanoic acid (PFTTrDA)                       | 72629-94-8  | 0.25 µg/L                | 99.4             | 65.0                  | 144  |
| EP231X: Perfluorotetradecanoic acid (PFTeDA)                       | 376-06-7          | 0.625 µg/L                                                        | 118         | 71.0                     | 132              |                       |      |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4053879)               |                   |                                                                   |             |                          |                  |                       |      |
| EP2114474-003                                                      | Anonymous         | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.25 µg/L                | 106              | 67.0                  | 137  |
|                                                                    |                   | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.625 µg/L               | 129              | 68.0                  | 141  |
|                                                                    |                   | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.625 µg/L               | 106              | 62.6                  | 147  |
|                                                                    |                   | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.625 µg/L               | 118              | 66.0                  | 145  |
|                                                                    |                   | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.625 µg/L               | 110              | 57.6                  | 145  |
|                                                                    |                   | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9   | 0.25 µg/L                | 111              | 65.0                  | 136  |
|                                                                    |                   | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.25 µg/L                | 86.6             | 61.0                  | 135  |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4053879)        |                   |                                                                   |             |                          |                  |                       |      |
| EP2114474-003                                                      | Anonymous         | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.25 µg/L                | 94.2             | 63.0                  | 143  |
|                                                                    |                   | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 27619-97-2  | 0.25 µg/L                | 95.6             | 64.0                  | 140  |
|                                                                    |                   | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | 39108-34-4  | 0.25 µg/L                | 116              | 67.0                  | 138  |



Sub-Matrix: WATER

|                                                                         |           |                                                     |             | Matrix Spike (MS) Report |                  |                       |      |
|-------------------------------------------------------------------------|-----------|-----------------------------------------------------|-------------|--------------------------|------------------|-----------------------|------|
|                                                                         |           |                                                     |             | Spike                    | SpikeRecovery(%) | Acceptable Limits (%) |      |
| Laboratory sample ID                                                    | Sample ID | Method: Compound                                    | CAS Number  | Concentration            | MS               | Low                   | High |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4053879) - continued |           |                                                     |             |                          |                  |                       |      |
| EP2114474-003                                                           | Anonymous | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS) | 120226-60-0 | 0.25 µg/L                | 143              | 71.4                  | 144  |

## QA/QC Compliance Assessment to assist with Quality Review

Work Order : EP2114473

Page : 1 of 5

Client : CARDNO (WA) PTY LTD  
Contact :   
Project : WA\_0960\_PFASOMP  
Site : DEF19009/Learmonth  
Sampler :   
Order number : DEF19009/0960

Laboratory : Environmental Division Perth  
Telephone : +61-8-9406 1301  
Date Samples Received : 29-Nov-2021  
Issue Date : 08-Dec-2021  
No. of samples received : 3  
No. of samples analysed : 3

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

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

### Summary of Outliers

#### Outliers : Quality Control Samples

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

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- 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.

*Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes*

| Compound Group Name                             | Laboratory Sample ID | Client Sample ID  | Analyte                               | CAS Number | Data           | Limits | Comment                                                                                      |
|-------------------------------------------------|----------------------|-------------------|---------------------------------------|------------|----------------|--------|----------------------------------------------------------------------------------------------|
| <b>Matrix Spike (MS) Recoveries</b>             |                      |                   |                                       |            |                |        |                                                                                              |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA | EP2114473--001       | 0960_SW207_211125 | <b>Sulfate as SO4 - Turbidimetric</b> | 14808-79-8 | Not Determined | ----   | <b>MS recovery not determined, background level greater than or equal to 4x spike level.</b> |
| ED045G: Chloride by Discrete Analyser           | EP2114473--001       | 0960_SW207_211125 | <b>Chloride</b>                       | 16887-00-6 | Not Determined | ----   | <b>MS recovery not determined, background level greater than or equal to 4x spike level.</b> |

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.

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                                                             | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |
|------------------------------------------------------------------------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|
| Container / Client Sample ID(s)                                                    |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| ED037P: Alkalinity by PC Titrator                                                  |             |                          |                    |            |               |                  |            |
| Clear Plastic Bottle - Natural (ED037-P)<br>0960_SW207_211125, 0960_SW301_211125   | 25-Nov-2021 | ----                     | ----               | ----       | 04-Dec-2021   | 09-Dec-2021      | ✓          |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA                                    |             |                          |                    |            |               |                  |            |
| Clear Plastic Bottle - Natural (ED041G)<br>0960_SW207_211125, 0960_SW301_211125    | 25-Nov-2021 | ----                     | ----               | ----       | 30-Nov-2021   | 23-Dec-2021      | ✓          |
| ED045G: Chloride by Discrete Analyser                                              |             |                          |                    |            |               |                  |            |
| Clear Plastic Bottle - Natural (ED045G)<br>0960_SW207_211125, 0960_SW301_211125    | 25-Nov-2021 | ----                     | ----               | ----       | 30-Nov-2021   | 23-Dec-2021      | ✓          |
| ED093F: Dissolved Major Cations                                                    |             |                          |                    |            |               |                  |            |
| Clear Plastic Bottle - Natural (ED093F)<br>0960_SW207_211125, 0960_SW301_211125    | 25-Nov-2021 | ----                     | ----               | ----       | 02-Dec-2021   | 02-Dec-2021      | ✓          |
| EP231A: Perfluoroalkyl Sulfonic Acids                                              |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)<br>0960_SW207_211125, 0960_SW301_211125, 0960_SW205_211125 | 25-Nov-2021 | 06-Dec-2021              | 24-May-2022        | ✓          | 07-Dec-2021   | 24-May-2022      | ✓          |
| EP231B: Perfluoroalkyl Carboxylic Acids                                            |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)<br>0960_SW207_211125, 0960_SW301_211125, 0960_SW205_211125 | 25-Nov-2021 | 06-Dec-2021              | 24-May-2022        | ✓          | 07-Dec-2021   | 24-May-2022      | ✓          |



Matrix: WATER Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                                             | Sample Date        | Extraction / Preparation |                    |             | Analysis      |                  |             |   |
|--------------------------------------------------------------------|--------------------|--------------------------|--------------------|-------------|---------------|------------------|-------------|---|
| Container / Client Sample ID(s)                                    |                    | Date extracted           | Due for extraction | Evaluation  | Date analysed | Due for analysis | Evaluation  |   |
| EP231C: Perfluoroalkyl Sulfonamides                                |                    |                          |                    |             |               |                  |             |   |
| HDPE (no PTFE) (EP231X)<br>0960_SW207_211125,<br>0960_SW301_211125 | 0960_SW205_211125, | 25-Nov-2021              | 06-Dec-2021        | 24-May-2022 | ✓             | 07-Dec-2021      | 24-May-2022 | ✓ |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids                         |                    |                          |                    |             |               |                  |             |   |
| HDPE (no PTFE) (EP231X)<br>0960_SW207_211125,<br>0960_SW301_211125 | 0960_SW205_211125, | 25-Nov-2021              | 06-Dec-2021        | 24-May-2022 | ✓             | 07-Dec-2021      | 24-May-2022 | ✓ |
| EP231P: PFAS Sums                                                  |                    |                          |                    |             |               |                  |             |   |
| HDPE (no PTFE) (EP231X)<br>0960_SW207_211125,<br>0960_SW301_211125 | 0960_SW205_211125, | 25-Nov-2021              | 06-Dec-2021        | 24-May-2022 | ✓             | 07-Dec-2021      | 24-May-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                            |         | Count |         | Rate (%) |          |            | Quality Control Specification  |
|--------------------------------------------------------|---------|-------|---------|----------|----------|------------|--------------------------------|
| Analytical Methods                                     | Method  | QC    | Regular | Actual   | Expected | Evaluation |                                |
|                                                        |         |       |         |          |          |            |                                |
| Laboratory Duplicates (DUP)                            |         |       |         |          |          |            |                                |
| Alkalinity by PC Titrator                              | ED037-P | 4     | 39      | 10.26    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 2     | 15      | 13.33    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 2     | 19      | 10.53    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 2     | 19      | 10.53    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 2     | 19      | 10.53    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Laboratory Control Samples (LCS)                       |         |       |         |          |          |            |                                |
| Alkalinity by PC Titrator                              | ED037-P | 4     | 39      | 10.26    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 2     | 15      | 13.33    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 1     | 19      | 5.26     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 19      | 5.26     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 2     | 19      | 10.53    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Method Blanks (MB)                                     |         |       |         |          |          |            |                                |
| Alkalinity by PC Titrator                              | ED037-P | 2     | 39      | 5.13     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 1     | 15      | 6.67     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 1     | 19      | 5.26     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 19      | 5.26     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 1     | 19      | 5.26     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Matrix Spikes (MS)                                     |         |       |         |          |          |            |                                |
| Chloride by Discrete Analyser                          | ED045G  | 1     | 15      | 6.67     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 19      | 5.26     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 1     | 19      | 5.26     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |





## Brief Method Summaries

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

| Analytical Methods                                                 | Method       | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------------------|--------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alkalinity by PC Titrator                                          | ED037-P      | WATER  | In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                                                                                                                                                                                                                |
| Sulfate (Turbidimetric) as SO <sub>4</sub> 2- by Discrete Analyser | ED041G       | WATER  | In house: Referenced to APHA 4500-SO <sub>4</sub> . Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO <sub>4</sub> suspension is measured by a photometer and the SO <sub>4</sub> -2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                         |
| Chloride by Discrete Analyser                                      | ED045G       | WATER  | In house: Referenced to APHA 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA seal method 2 017-1-L                                                                                                                                                                                                                                                                                                                                      |
| Major Cations - Dissolved                                          | ED093F       | WATER  | In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                           |
| Ionic Balance by PCT DA and Turbi SO <sub>4</sub> DA               | * EN055 - PG | WATER  | In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS               | EP231X       | WATER  | In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements. |
| Preparation Methods                                                | Method       | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Solid Phase Extraction (SPE) for PFAS in water                     | ORG72        | WATER  | In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.                                                                                                                                                                                                |



# CHAIN OF CUSTODY

COC#: 30675

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: CG- DEF19009/Learmonth GW

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:

/ ES2019CARBSD0002

## LABORATORY USE ONLY (Circle)

Custody Seal intact?

Yes 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 | Ground Waters Primary WATER | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|------------|-------------|------------------------|--------|----------------------|---------|-----------------------------|----------------------|------------------------|
| 001    | 0960_MW139 |             | 25/11/2021<br>07:29 AM | Water  | ALS: 6<br>Non ALS: 0 | No      | Partial<br>4/8              | Extra lab QC PFAS    | Extra lab QC PFAS      |
| 002    | 0960_MW147 |             | 25/11/2021<br>07:59 AM | Water  | ALS: 4<br>Non ALS: 0 | No      | Partial<br>4/8              |                      |                        |
| 003    | 0960_MW122 |             | 25/11/2021<br>08:23 AM | Water  | ALS: 5<br>Non ALS: 0 | No      | Partial<br>4/8              | Extra lab QC PFAS    | Extra lab QC PFAS      |
| 004    | 0960_MW164 |             | 25/11/2021<br>09:00 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial<br>4/8              |                      |                        |
| 005    | 0960_MW211 |             | 25/11/2021<br>09:17 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial<br>4/8              |                      |                        |
| 006    | 0960_MW018 |             | 25/11/2021<br>09:30 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial<br>4/8              |                      |                        |
| 007    | 0960_MW103 |             | 25/11/2021<br>10:25 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial<br>4/8              |                      |                        |
| 008    | 0060_MW104 |             | 25/11/2021<br>11:21 AM | Water  | ALS: 6<br>Non ALS: 0 | No      | Partial<br>4/8              | Extra lab QC PFAS    | Extra lab QC PFAS      |
| 009    | 0960_MW124 |             | 25/11/2021<br>11:59 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial<br>4/8              |                      |                        |



# CHAIN OF CUSTODY

COC#: 30675

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: CG-DEF19009/Learmonth GW

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:

/ ES2019CARBSD0002

**LABORATORY USE ONLY (Circle)**

Custody Seal intact?

Yes 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    | 0960_MW139  | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 002    | 0960_MW147  | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 003    | 0960_MW122  | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 004    | 0960_MW164  | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 005    | 0960_MW211  | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 006    | 0960_MW018  | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 007    | 0960_MW103  | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 008    | 0060_MW104  | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 009    | 0960_MW124  | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |



# CHAIN OF CUSTODY

COC#: 30675

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: CG- DEF19009/Learmonth GW

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:

/ ES2019CARBSD0002

## LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes 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    | 0960_MW139  | Clear Plastic Bottle - Natural | 250 mL | 00070220143176 | Green | No       |        |
| 001    | 0960_MW139  | Clear Plastic Bottle - Natural | 250 mL | 00070220143196 | Green | No       |        |
| 001    | 0960_MW139  | HDPE (no PTFE)                 | 20 mL  | 00352010040059 | Grey  | No       |        |
| 001    | 0960_MW139  | HDPE (no PTFE)                 | 20 mL  | 00352010039998 | Grey  | No       |        |
| 001    | 0960_MW139  | HDPE (no PTFE)                 | 20 mL  | 00350019164231 | Grey  | No       |        |
| 001    | 0960_MW139  | HDPE (no PTFE)                 | 20 mL  | 00350019164333 | Grey  | No       |        |
| 002    | 0960_MW147  | Clear Plastic Bottle - Natural | 250 mL | 00070220143216 | Green | No       |        |
| 002    | 0960_MW147  | Clear Plastic Bottle - Natural | 250 mL | 00070220143199 | Green | No       |        |
| 002    | 0960_MW147  | HDPE (no PTFE)                 | 20 mL  | 00352010040143 | Grey  | No       |        |
| 002    | 0960_MW147  | HDPE (no PTFE)                 | 20 mL  | 00352010039916 | Grey  | No       |        |
| 003    | 0960_MW122  | Clear Plastic Bottle - Natural | 250 mL | 00070719042796 | Green | No       |        |
| 003    | 0960_MW122  | HDPE (no PTFE)                 | 20 mL  | 00350019164007 | Grey  | No       |        |
| 003    | 0960_MW122  | HDPE (no PTFE)                 | 20 mL  | 00350019154280 | Grey  | No       |        |
| 003    | 0960_MW122  | HDPE (no PTFE)                 | 20 mL  | 00352005016261 | Grey  | No       |        |
| 003    | 0960_MW122  | HDPE (no PTFE)                 | 20 mL  | 00352005016156 | Grey  | No       |        |
| 004    | 0960_MW164  | Clear Plastic Bottle - Natural | 250 mL | 00070621191213 | Green | No       |        |
| 004    | 0960_MW164  | HDPE (no PTFE)                 | 20 mL  | 00352101071643 | Grey  | No       |        |
| 004    | 0960_MW164  | HDPE (no PTFE)                 | 20 mL  | 00352101071460 | Grey  | No       |        |
| 005    | 0960_MW211  | Clear Plastic Bottle - Natural | 250 mL | 00070621191111 | Green | No       |        |
| 005    | 0960_MW211  | HDPE (no PTFE)                 | 20 mL  | 00352101038022 | Grey  | No       |        |
| 005    | 0960_MW211  | HDPE (no PTFE)                 | 20 mL  | 00352101071871 | Grey  | No       |        |
| 006    | 0960_MW018  | Clear Plastic Bottle - Natural | 250 mL | 00070621191278 | Green | No       |        |
| 006    | 0960_MW018  | HDPE (no PTFE)                 | 20 mL  | 00352101071859 | Grey  | No       |        |
| 006    | 0960_MW018  | HDPE (no PTFE)                 | 20 mL  | 00352101071605 | Grey  | No       |        |
| 007    | 0960_MW103  | Clear Plastic Bottle - Natural | 250 mL | 00070621191114 | Green | No       |        |
| 007    | 0960_MW103  | HDPE (no PTFE)                 | 20 mL  | 00352101070871 | Grey  | No       |        |



# CHAIN OF CUSTODY

ALS COC#: 30675

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: CG- DEF19009/Leamonth GW

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:

/ ES2019CARBSD0002

## LABORATORY USE ONLY (Circle)

Custody Seal intact?

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 | 0960_MW103 | HDPE (no PTFE)                 | 20 mL  | 00352101071334 | Grey  | No |  |
| 008 | 0060_MW104 | Clear Plastic Bottle - Natural | 250 mL | 00070621191098 | Green | No |  |
| 008 | 0060_MW104 | HDPE (no PTFE)                 | 20 mL  | 00352101071642 | Grey  | No |  |
| 008 | 0060_MW104 | HDPE (no PTFE)                 | 20 mL  | 00352101071212 | Grey  | No |  |
| 008 | 0060_MW104 | HDPE (no PTFE)                 | 20 mL  | 00350019164115 | Grey  | No |  |
| 008 | 0060_MW104 | HDPE (no PTFE)                 | 20 mL  | 00350019164020 | Grey  | No |  |
| 008 | 0060_MW104 | HDPE (no PTFE)                 | 20 mL  | 00350019164014 | Grey  | No |  |
| 009 | 0960_MW124 | Clear Plastic Bottle - Natural | 250 mL | 00070621191156 | Green | No |  |
| 009 | 0960_MW124 | HDPE (no PTFE)                 | 20 mL  | 00352101071747 | Grey  | No |  |
| 009 | 0960_MW124 | HDPE (no PTFE)                 | 20 mL  | 00352101038051 | Grey  | No |  |

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

**SAMPLE RECEIPT NOTIFICATION (SRN)****Work Order : EP2114474**

|              |                                                                  |              |                                              |
|--------------|------------------------------------------------------------------|--------------|----------------------------------------------|
| Client       | : CARDNO (WA) PTY LTD                                            | Laboratory   | : Environmental Division Perth               |
| Contact      | : [REDACTED]                                                     | Contact      | : Customer Services EP                       |
| Address      | : 11 HARVEST TERRACE PO BOX 155<br>WEST PERTH WA, AUSTRALIA 6006 | Address      | : 26 Rigali Way Wangara WA Australia<br>6065 |
| E-mail       | : [REDACTED]@cardno.com.au                                       | E-mail       | : ALSEnviro.Perth@alsglobal.com              |
| Telephone    | : ----                                                           | Telephone    | : +61-8-9406 1301                            |
| Facsimile    | : ----                                                           | Facsimile    | : +61-8-9406 1399                            |
| Project      | : WA_0960_PFASOMP                                                | Page         | : 1 of 2                                     |
| Order number | : DEF19009/0960                                                  | Quote number | : ES2019CARBSD0002 (SY/139/19)               |
| C-O-C number | : 30675                                                          | QC Level     | : NEPM 2013 B3 & ALS QC Standard             |
| Site         | : DEF19009/Learmonth                                             |              |                                              |
| Sampler      | : [REDACTED]                                                     |              |                                              |

**Dates**

|                           |                     |                          |                      |
|---------------------------|---------------------|--------------------------|----------------------|
| Date Samples Received     | : 29-Nov-2021 11:30 | Issue Date               | : 29-Nov-2021        |
| Client Requested Due Date | : 08-Dec-2021       | Scheduled Reporting Date | : <b>08-Dec-2021</b> |

**Delivery Details**

|                      |           |                                    |                      |
|----------------------|-----------|------------------------------------|----------------------|
| Mode of Delivery     | : Carrier | Security Seal                      | : Not Available      |
| No. of coolers/boxes | : 2       | Temperature                        | : 23.1 - Ice present |
| Receipt Detail       | :         | No. of samples received / analysed | : 9 / 9              |

**General Comments**

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





## Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exists.

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

| Laboratory sample ID | Sampling date / time | Sample ID         | WATER - EN055 - PG<br>Ionic Balance by ED037P, ED041G, ED045G & ED046G | WATER - EP231X<br>PFAS - Full Suite (28 analytes) | WATER - NT-01<br>Major Cations (Ca, Mg, Na, K) | WATER - NT-02<br>Major Anions (Chloride, Sulphate, Alkalinity) |
|----------------------|----------------------|-------------------|------------------------------------------------------------------------|---------------------------------------------------|------------------------------------------------|----------------------------------------------------------------|
| EP2114474-001        | 25-Nov-2021 07:29    | 0960_MW139_211125 | ✓                                                                      | ✓                                                 | ✓                                              | ✓                                                              |
| EP2114474-002        | 25-Nov-2021 07:59    | 0960_MW147_211125 | ✓                                                                      | ✓                                                 | ✓                                              | ✓                                                              |
| EP2114474-003        | 25-Nov-2021 08:23    | 0960_MW122_211125 | ✓                                                                      | ✓                                                 | ✓                                              | ✓                                                              |
| EP2114474-004        | 25-Nov-2021 09:00    | 0960_MW164_211125 | ✓                                                                      | ✓                                                 | ✓                                              | ✓                                                              |
| EP2114474-005        | 25-Nov-2021 09:17    | 0960_MW211_211125 | ✓                                                                      | ✓                                                 | ✓                                              | ✓                                                              |
| EP2114474-006        | 25-Nov-2021 09:30    | 0960_MW018_211125 | ✓                                                                      | ✓                                                 | ✓                                              | ✓                                                              |
| EP2114474-007        | 25-Nov-2021 10:25    | 0960_MW103_211125 | ✓                                                                      | ✓                                                 | ✓                                              | ✓                                                              |
| EP2114474-008        | 25-Nov-2021 11:21    | 0060_MW104_211125 | ✓                                                                      | ✓                                                 | ✓                                              | ✓                                                              |
| EP2114474-009        | 25-Nov-2021 11:59    | 0960_MW124_211125 | ✓                                                                      | ✓                                                 | ✓                                              | ✓                                                              |

## Proactive Holding Time Report

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

## Requested Deliverables

|                                                                                                                  |       |                              |
|------------------------------------------------------------------------------------------------------------------|-------|------------------------------|
| <ul style="list-style-type: none"> <li>- A4 - AU Tax Invoice (INV)</li> </ul>                                    | Email | cardno.com.au                |
| <b>DERP LAB REPORTS</b>                                                                                          |       |                              |
| <ul style="list-style-type: none"> <li>- EDI Format - ESDAT (ESDAT)</li> </ul>                                   | Email | derp.labreports@esdat.com.au |
| <ul style="list-style-type: none"> <li>- *AU Certificate of Analysis - NATA (COA)</li> </ul>                     | Email | cardno.com.au                |
| <ul style="list-style-type: none"> <li>- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)</li> </ul>    | Email | cardno.com.au                |
| <ul style="list-style-type: none"> <li>- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)</li> </ul>            | Email | cardno.com.au                |
| <ul style="list-style-type: none"> <li>- A4 - AU Sample Receipt Notification - Environmental HT (SRN)</li> </ul> | Email | cardno.com.au                |
| <ul style="list-style-type: none"> <li>- Chain of Custody (CoC) (COC)</li> </ul>                                 | Email | cardno.com.au                |
| <ul style="list-style-type: none"> <li>- EDI Format - ESDAT (ESDAT)</li> </ul>                                   | Email | cardno.com.au                |
| <ul style="list-style-type: none"> <li>- EDI Format - XTab (XTAB)</li> </ul>                                     | Email | cardno.com.au                |
| <b>Perth</b>                                                                                                     |       |                              |
| <ul style="list-style-type: none"> <li>- A4 - AU Tax Invoice (INV)</li> </ul>                                    | Email | perth@cardno.com.au          |

## CERTIFICATE OF ANALYSIS

**Work Order** : **EP2114474**  
**Client** : **CARDNO (WA) PTY LTD**  
**Contact** : [REDACTED]  
**Address** : 11 HARVEST TERRACE PO BOX 155  
 WEST PERTH WA, AUSTRALIA 6006  
**Telephone** : ----  
**Project** : WA\_0960\_PFASOMP  
**Order number** : DEF19009/0960  
**C-O-C number** : 30675  
**Sampler** : [REDACTED]  
**Site** : DEF19009/Learmonth  
**Quote number** : SY/139/19  
**No. of samples received** : 9  
**No. of samples analysed** : 9

**Page** : 1 of 9  
**Laboratory** : Environmental Division Perth  
**Contact** : Customer Services EP  
**Address** : 26 Rigali Way Wangara WA Australia 6065  
**Telephone** : +61-8-9406 1301  
**Date Samples Received** : 29-Nov-2021 11:30  
**Date Analysis Commenced** : 30-Nov-2021  
**Issue Date** : 08-Dec-2021 12:33



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>    |
|------------------------------------------------------------------------|----------------------------|----------------------------------|
| <span style="background-color: black; color: black;">[REDACTED]</span> | Laboratory Manager (Perth) | Perth Inorganics, Wangara, WA    |
| <span style="background-color: black; color: black;">[REDACTED]</span> | Metals Chemist             | Perth Inorganics, Wangara, WA    |
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator           | Sydney Organics, Smithfield, NSW |



## 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.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- 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.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, 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: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                        |             |      |       | 0960_MW139_211125 | 0960_MW147_211125 | 0960_MW122_211125 | 0960_MW164_211125 | 0960_MW211_211125 |
|--------------------------------------------------------|-------------|------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                   |             |      |       | 25-Nov-2021 07:29 | 25-Nov-2021 07:59 | 25-Nov-2021 08:23 | 25-Nov-2021 09:00 | 25-Nov-2021 09:17 |
| Compound                                               | CAS Number  | LOR  | Unit  | EP2114474-001     | EP2114474-002     | EP2114474-003     | EP2114474-004     | EP2114474-005     |
|                                                        |             |      |       | Result            | Result            | Result            | Result            | Result            |
| <b>ED037P: Alkalinity by PC Titrator</b>               |             |      |       |                   |                   |                   |                   |                   |
| Hydroxide Alkalinity as CaCO3                          | DMO-210-001 | 1    | mg/L  | <1                | <1                | <1                | <1                | <1                |
| Carbonate Alkalinity as CaCO3                          | 3812-32-6   | 1    | mg/L  | <1                | <1                | <1                | <1                | 32                |
| Bicarbonate Alkalinity as CaCO3                        | 71-52-3     | 1    | mg/L  | 192               | 159               | 384               | 624               | 730               |
| Total Alkalinity as CaCO3                              | ----        | 1    | mg/L  | 192               | 159               | 384               | 624               | 763               |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b> |             |      |       |                   |                   |                   |                   |                   |
| Sulfate as SO4 - Turbidimetric                         | 14808-79-8  | 1    | mg/L  | 3530              | 5810              | 2000              | 785               | 86                |
| <b>ED045G: Chloride by Discrete Analyser</b>           |             |      |       |                   |                   |                   |                   |                   |
| Chloride                                               | 16887-00-6  | 1    | mg/L  | 21100             | 38700             | 12800             | 3620              | 158               |
| <b>ED093F: Dissolved Major Cations</b>                 |             |      |       |                   |                   |                   |                   |                   |
| Calcium                                                | 7440-70-2   | 1    | mg/L  | 693               | 1090              | 294               | 154               | 2                 |
| Magnesium                                              | 7439-95-4   | 1    | mg/L  | 1530              | 2930              | 762               | 179               | 4                 |
| Sodium                                                 | 7440-23-5   | 1    | mg/L  | 12000             | 24800             | 7790              | 2420              | 423               |
| Potassium                                              | 7440-09-7   | 1    | mg/L  | 627               | 1110              | 396               | 97                | 15                |
| <b>EN055: Ionic Balance</b>                            |             |      |       |                   |                   |                   |                   |                   |
| ∅ Total Anions                                         | ----        | 0.01 | meq/L | 672               | 1220              | 410               | 131               | 21.5              |
| ∅ Total Cations                                        | ----        | 0.01 | meq/L | 698               | 1400              | 426               | 130               | 19.2              |
| ∅ Ionic Balance                                        | ----        | 0.01 | %     | 1.89              | 7.14              | 1.91              | 0.29              | 5.60              |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>           |             |      |       |                   |                   |                   |                   |                   |
| Perfluorobutane sulfonic acid (PFBS)                   | 375-73-5    | 0.02 | µg/L  | <0.02             | <0.02             | <0.02             | 0.34              | 0.19              |
| Perfluoropentane sulfonic acid (PFPeS)                 | 2706-91-4   | 0.02 | µg/L  | <0.02             | <0.02             | <0.02             | 0.36              | 0.13              |
| Perfluorohexane sulfonic acid (PFHxS)                  | 355-46-4    | 0.01 | µg/L  | <0.01             | <0.01             | <0.01             | 2.56              | 1.32              |
| Perfluoroheptane sulfonic acid (PFHpS)                 | 375-92-8    | 0.02 | µg/L  | <0.02             | <0.02             | <0.02             | 0.08              | 0.05              |
| Perfluorooctane sulfonic acid (PFOS)                   | 1763-23-1   | 0.01 | µg/L  | <0.01             | <0.01             | <0.01             | 1.77              | 2.81              |
| Perfluorodecane sulfonic acid (PFDS)                   | 335-77-3    | 0.02 | µg/L  | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>         |             |      |       |                   |                   |                   |                   |                   |
| 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             | 0.21              | 0.12              |
| Perfluorohexanoic acid (PFHxA)                         | 307-24-4    | 0.02 | µg/L  | <0.02             | <0.02             | <0.02             | 0.87              | 0.39              |
| Perfluoroheptanoic acid (PFHpA)                        | 375-85-9    | 0.02 | µg/L  | <0.02             | <0.02             | <0.02             | 0.06              | 0.05              |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_MW139_211125 | 0960_MW147_211125 | 0960_MW122_211125 | 0960_MW164_211125 | 0960_MW211_211125 |
|------------------------------------------------------------|-------------|------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                       |             |      |      | 25-Nov-2021 07:29 | 25-Nov-2021 07:59 | 25-Nov-2021 08:23 | 25-Nov-2021 09:00 | 25-Nov-2021 09:17 |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2114474-001     | EP2114474-002     | EP2114474-003     | EP2114474-004     | EP2114474-005     |
|                                                            |             |      |      | Result            | Result            | Result            | Result            | Result            |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                   |                   |                   |                   |                   |
| Perfluorooctanoic acid (PFOA)                              | 335-67-1    | 0.01 | µg/L | <0.01             | <0.01             | <0.01             | <b>0.10</b>       | <b>0.08</b>       |
| 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             |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                   |                   |                   |                   |                   |
| Perfluorooctane sulfonamide (FOSA)                         | 754-91-6    | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)              | 31506-32-8  | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)               | 4151-50-2   | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)       | 24448-09-7  | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)        | 1691-99-2   | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)  | 2355-31-9   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)   | 2991-50-6   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                   |                   |                   |                   |                   |
| 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             |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_MW139_211125 | 0960_MW147_211125 | 0960_MW122_211125 | 0960_MW164_211125 | 0960_MW211_211125 |
|---------------------------------------------------------------|--------------------|------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                          |                    |      |      | 25-Nov-2021 07:29 | 25-Nov-2021 07:59 | 25-Nov-2021 08:23 | 25-Nov-2021 09:00 | 25-Nov-2021 09:17 |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2114474-001     | EP2114474-002     | EP2114474-003     | EP2114474-004     | EP2114474-005     |
|                                                               |                    |      |      | Result            | Result            | Result            | Result            | Result            |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                   |                   |                   |                   |                   |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                   |                   |                   |                   |                   |
| Sum of PFAS                                                   | ----               | 0.01 | µg/L | <0.01             | <0.01             | <0.01             | 6.35              | 5.14              |
| Sum of PFHxS and PFOS                                         | 355-46-4/1763-23-1 | 0.01 | µg/L | <0.01             | <0.01             | <0.01             | 4.33              | 4.13              |
| Sum of PFAS (WA DER List)                                     | ----               | 0.01 | µg/L | <0.01             | <0.01             | <0.01             | 5.91              | 4.96              |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 104               | 106               | 103               | 95.6              | 102               |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 104               | 108               | 104               | 97.6              | 110               |





## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                                   |             |      |       | 0960_MW018_211125 | 0960_MW103_211125 | 0060_MW104_211125 | 0960_MW124_211125 | ----  |
|-------------------------------------------------------------------|-------------|------|-------|-------------------|-------------------|-------------------|-------------------|-------|
| Sampling date / time                                              |             |      |       | 25-Nov-2021 09:30 | 25-Nov-2021 10:25 | 25-Nov-2021 11:21 | 25-Nov-2021 11:59 | ----  |
| Compound                                                          | CAS Number  | LOR  | Unit  | EP2114474-006     | EP2114474-007     | EP2114474-008     | EP2114474-009     | ----- |
|                                                                   |             |      |       | Result            | Result            | Result            | Result            | ----  |
| <b>ED037P: Alkalinity by PC Titrator</b>                          |             |      |       |                   |                   |                   |                   |       |
| Hydroxide Alkalinity as CaCO <sub>3</sub>                         | DMO-210-001 | 1    | mg/L  | <1                | <1                | <1                | <1                | ----  |
| Carbonate Alkalinity as CaCO <sub>3</sub>                         | 3812-32-6   | 1    | mg/L  | <1                | <1                | <1                | <1                | ----  |
| Bicarbonate Alkalinity as CaCO <sub>3</sub>                       | 71-52-3     | 1    | mg/L  | 938               | 156               | 219               | 153               | ----  |
| Total Alkalinity as CaCO <sub>3</sub>                             | ----        | 1    | mg/L  | 938               | 156               | 219               | 153               | ----  |
| <b>ED041G: Sulfate (Turbidimetric) as SO<sub>4</sub> 2- by DA</b> |             |      |       |                   |                   |                   |                   |       |
| Sulfate as SO <sub>4</sub> - Turbidimetric                        | 14808-79-8  | 1    | mg/L  | 211               | 2660              | 4060              | 4600              | ----  |
| <b>ED045G: Chloride by Discrete Analyser</b>                      |             |      |       |                   |                   |                   |                   |       |
| Chloride                                                          | 16887-00-6  | 1    | mg/L  | 361               | 28300             | 29700             | 31400             | ----  |
| <b>ED093F: Dissolved Major Cations</b>                            |             |      |       |                   |                   |                   |                   |       |
| Calcium                                                           | 7440-70-2   | 1    | mg/L  | 5                 | 1410              | 782               | 926               | ----  |
| Magnesium                                                         | 7439-95-4   | 1    | mg/L  | 8                 | 2130              | 2230              | 2320              | ----  |
| Sodium                                                            | 7440-23-5   | 1    | mg/L  | 610               | 16300             | 18300             | 20000             | ----  |
| Potassium                                                         | 7440-09-7   | 1    | mg/L  | 20                | 728               | 886               | 946               | ----  |
| <b>EN055: Ionic Balance</b>                                       |             |      |       |                   |                   |                   |                   |       |
| ∅ Total Anions                                                    | ----        | 0.01 | meq/L | 33.3              | 857               | 927               | 984               | ----  |
| ∅ Total Cations                                                   | ----        | 0.01 | meq/L | 28.0              | 973               | 1040              | 1130              | ----  |
| ∅ Ionic Balance                                                   | ----        | 0.01 | %     | 8.76              | 6.36              | 5.82              | 6.93              | ----  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>                      |             |      |       |                   |                   |                   |                   |       |
| Perfluorobutane sulfonic acid (PFBS)                              | 375-73-5    | 0.02 | µg/L  | 0.20              | 0.31              | 0.06              | <0.02             | ----  |
| Perfluoropentane sulfonic acid (PFPeS)                            | 2706-91-4   | 0.02 | µg/L  | 0.20              | 0.11              | <0.02             | <0.02             | ----  |
| Perfluorohexane sulfonic acid (PFHxS)                             | 355-46-4    | 0.01 | µg/L  | 1.58              | 0.45              | 0.05              | <0.01             | ----  |
| Perfluoroheptane sulfonic acid (PFHpS)                            | 375-92-8    | 0.02 | µg/L  | 0.05              | <0.02             | <0.02             | <0.02             | ----  |
| Perfluorooctane sulfonic acid (PFOS)                              | 1763-23-1   | 0.01 | µg/L  | 0.88              | 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             | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>                    |             |      |       |                   |                   |                   |                   |       |
| 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  | 0.15              | 0.02              | <0.02             | <0.02             | ----  |
| Perfluorohexanoic acid (PFHxA)                                    | 307-24-4    | 0.02 | µg/L  | 0.54              | 0.11              | <0.02             | <0.02             | ----  |
| Perfluoroheptanoic acid (PFHpA)                                   | 375-85-9    | 0.02 | µg/L  | 0.04              | <0.02             | <0.02             | <0.02             | ----  |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_MW018_211125 | 0960_MW103_211125 | 0060_MW104_211125 | 0960_MW124_211125 | ----  |
|------------------------------------------------------------|-------------|------|------|-------------------|-------------------|-------------------|-------------------|-------|
| Sampling date / time                                       |             |      |      | 25-Nov-2021 09:30 | 25-Nov-2021 10:25 | 25-Nov-2021 11:21 | 25-Nov-2021 11:59 | ----  |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2114474-006     | EP2114474-007     | EP2114474-008     | EP2114474-009     | ----- |
|                                                            |             |      |      | Result            | Result            | Result            | Result            | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                   |                   |                   |                   |       |
| Perfluorooctanoic acid (PFOA)                              | 335-67-1    | 0.01 | µg/L | 0.07              | <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             | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                   |                   |                   |                   |       |
| 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             | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                   |                   |                   |                   |       |
| 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             | ----  |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_MW018_211125 | 0960_MW103_211125 | 0060_MW104_211125 | 0960_MW124_211125 | ----  |
|---------------------------------------------------------------|--------------------|------|------|-------------------|-------------------|-------------------|-------------------|-------|
| Sampling date / time                                          |                    |      |      | 25-Nov-2021 09:30 | 25-Nov-2021 10:25 | 25-Nov-2021 11:21 | 25-Nov-2021 11:59 | ----  |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2114474-006     | EP2114474-007     | EP2114474-008     | EP2114474-009     | ----- |
|                                                               |                    |      |      | Result            | Result            | Result            | Result            | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                   |                   |                   |                   |       |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | ----  |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                   |                   |                   |                   |       |
| Sum of PFAS                                                   | ----               | 0.01 | µg/L | 3.81              | 1.01              | 0.11              | <0.01             | ----  |
| Sum of PFHxS and PFOS                                         | 355-46-4/1763-23-1 | 0.01 | µg/L | 2.46              | 0.46              | 0.05              | <0.01             | ----  |
| Sum of PFAS (WA DER List)                                     | ----               | 0.01 | µg/L | 3.56              | 0.90              | 0.11              | <0.01             | ----  |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                   |                   |                   |                   |       |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 100               | 102               | 97.4              | 105               | ----  |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 99.1              | 106               | 98.6              | 105               | ----  |



## Surrogate Control Limits

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

## Inter-Laboratory Testing

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

|                                |                                                                          |                                |                                                  |
|--------------------------------|--------------------------------------------------------------------------|--------------------------------|--------------------------------------------------|
| <b>Work Order</b>              | <b>: EP2114474</b>                                                       | <b>Page</b>                    | <b>: 1 of 8</b>                                  |
| <b>Client</b>                  | <b>: CARDNO (WA) PTY LTD</b>                                             | <b>Laboratory</b>              | <b>: Environmental Division Perth</b>            |
| <b>Contact</b>                 | <b>: [REDACTED]</b>                                                      | <b>Contact</b>                 | <b>: Customer Services EP</b>                    |
| <b>Address</b>                 | <b>: 11 HARVEST TERRACE PO BOX 155<br/>WEST PERTH WA, AUSTRALIA 6006</b> | <b>Address</b>                 | <b>: 26 Rigali Way Wangara WA Australia 6065</b> |
| <b>Telephone</b>               | <b>: ----</b>                                                            | <b>Telephone</b>               | <b>: +61-8-9406 1301</b>                         |
| <b>Project</b>                 | <b>: WA_0960_PFASOMP</b>                                                 | <b>Date Samples Received</b>   | <b>: 29-Nov-2021</b>                             |
| <b>Order number</b>            | <b>: DEF19009/0960</b>                                                   | <b>Date Analysis Commenced</b> | <b>: 30-Nov-2021</b>                             |
| <b>C-O-C number</b>            | <b>: 30675</b>                                                           | <b>Issue Date</b>              | <b>: 08-Dec-2021</b>                             |
| <b>Sampler</b>                 | <b>: [REDACTED]</b>                                                      |                                |                                                  |
| <b>Site</b>                    | <b>: DEF19009/Learmonth</b>                                              |                                |                                                  |
| <b>Quote number</b>            | <b>: SY/139/19</b>                                                       |                                |                                                  |
| <b>No. of samples received</b> | <b>: 9</b>                                                               |                                |                                                  |
| <b>No. of samples analysed</b> | <b>: 9</b>                                                               |                                |                                                  |



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

This Quality Control Report contains the following information:

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

### Signatories

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

| Signatories | Position                   | Accreditation Category           |
|-------------|----------------------------|----------------------------------|
| [REDACTED]  | Laboratory Manager (Perth) | Perth Inorganics, Wangara, WA    |
| [REDACTED]  | Metals Chemist             | Perth Inorganics, Wangara, WA    |
| [REDACTED]  | LCMS Coordinator           | Sydney Organics, Smithfield, NSW |



## 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**

| Sub-Matrix: WATER                                                 |                   |                                          |             | Laboratory Duplicate (DUP) Report |      |                 |                  |         |                    |
|-------------------------------------------------------------------|-------------------|------------------------------------------|-------------|-----------------------------------|------|-----------------|------------------|---------|--------------------|
| Laboratory sample ID                                              | Sample ID         | Method: Compound                         | CAS Number  | LOR                               | Unit | Original Result | Duplicate Result | RPD (%) | Acceptable RPD (%) |
| ED037P: Alkalinity by PC Titrator (QC Lot: 4055133)               |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2114473-003                                                     | Anonymous         | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 186             | 190              | 2.2     | 0% - 20%           |
|                                                                   |                   | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 186             | 190              | 2.2     | 0% - 20%           |
| EP2114590-001                                                     | Anonymous         | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 136             | 136              | 0.0     | 0% - 20%           |
|                                                                   |                   | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 136             | 136              | 0.0     | 0% - 20%           |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4044099) |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2114471-001                                                     | Anonymous         | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 2650            | 2650             | 0.0     | 0% - 20%           |
| EP2114474-001                                                     | 0960_MW139_211125 | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 3530            | 3560             | 0.8     | 0% - 20%           |
| ED045G: Chloride by Discrete Analyser (QC Lot: 4044098)           |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2114471-001                                                     | Anonymous         | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 19400           | 19200            | 1.3     | 0% - 20%           |
| EP2114474-001                                                     | 0960_MW139_211125 | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 21100           | 21000            | 0.7     | 0% - 20%           |
| ED093F: Dissolved Major Cations (QC Lot: 4045343)                 |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2114474-001                                                     | 0960_MW139_211125 | ED093F: Calcium                          | 7440-70-2   | 1                                 | mg/L | 693             | 748              | 7.7     | 0% - 20%           |
|                                                                   |                   | ED093F: Magnesium                        | 7439-95-4   | 1                                 | mg/L | 1530            | 1640             | 6.8     | 0% - 20%           |
|                                                                   |                   | ED093F: Sodium                           | 7440-23-5   | 1                                 | mg/L | 12000           | 12900            | 6.6     | 0% - 20%           |
|                                                                   |                   | ED093F: Potassium                        | 7440-09-7   | 1                                 | mg/L | 627             | 674              | 7.1     | 0% - 20%           |
| EP2114580-002                                                     | Anonymous         | ED093F: Calcium                          | 7440-70-2   | 1                                 | mg/L | 336             | 313              | 7.2     | 0% - 20%           |
|                                                                   |                   | ED093F: Magnesium                        | 7439-95-4   | 1                                 | mg/L | 749             | 703              | 6.3     | 0% - 20%           |
|                                                                   |                   | ED093F: Sodium                           | 7440-23-5   | 1                                 | mg/L | 6090            | 5690             | 6.8     | 0% - 20%           |
|                                                                   |                   | ED093F: Potassium                        | 7440-09-7   | 1                                 | mg/L | 309             | 288              | 7.0     | 0% - 20%           |





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: 4053879)   |                   |                                                                   |            |                                   |      |                 |                  |         |                    |
| EP2114474-001                                             | 0960_MW139_211125 | 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           |
| EP2114474-008                                             | 0060_MW104_211125 | EP231X: Perfluorohexane sulfonic acid (PFHxS)                     | 355-46-4   | 0.01                              | µg/L | 0.05            | 0.07             | 23.4    | 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 | 0.06            | 0.08             | 28.7    | 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: 4053879) |                   |                                                                   |            |                                   |      |                 |                  |         |                    |
| EP2114474-001                                             | 0960_MW139_211125 | 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           |
| EP2114474-008                                             | 0060_MW104_211125 | 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: 4053879)     |                   |                                                                   |            |                                   |      |                 |                  |         |                    |
| EP2114474-001                                             | 0960_MW139_211125 | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |                   | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |

| Sub-Matrix: WATER                                                 |                   |                                                                   |             | Laboratory Duplicate (DUP) Report |      |                 |                  |         |                    |
|-------------------------------------------------------------------|-------------------|-------------------------------------------------------------------|-------------|-----------------------------------|------|-----------------|------------------|---------|--------------------|
| Laboratory sample ID                                              | Sample ID         | Method: Compound                                                  | CAS Number  | LOR                               | Unit | Original Result | Duplicate Result | RPD (%) | Acceptable RPD (%) |
| EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4053879) - continued |                   |                                                                   |             |                                   |      |                 |                  |         |                    |
| EP2114474-001                                                     | 0960_MW139_211125 | 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           |
| EP2114474-008                                                     | 0060_MW104_211125 | 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: 4053879)      |                   |                                                                   |             |                                   |      |                 |                  |         |                    |
| EP2114474-001                                                     | 0960_MW139_211125 | 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           |
| EP2114474-008                                                     | 0060_MW104_211125 | 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: 4053879)                               |                   |                                                                   |             |                                   |      |                 |                  |         |                    |



| Sub-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: 4053879) - continued |                   |                     |            |                                   |      |                 |                  |         |                    |
| EP2114474-001                                   | 0960_MW139_211125 | EP231X: Sum of PFAS | ----       | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
| EP2114474-008                                   | 0060_MW104_211125 | EP231X: Sum of PFAS | ----       | 0.01                              | µg/L | 0.11            | 0.17             | 42.9    | 0% - 50%           |



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

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

Sub-Matrix: **WATER**

| Sub-Matrix: WATER                                                |             |      |      | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |      |
|------------------------------------------------------------------|-------------|------|------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|------|
|                                                                  |             |      |      |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |      |
| Method: Compound                                                 | CAS Number  | LOR  | Unit | Result                      |                                       |                           |                                   |      |
| ED037P: Alkalinity by PC Titrator (QCLot: 4055133)               |             |      |      |                             |                                       |                           |                                   |      |
| ED037-P: Hydroxide Alkalinity as CaCO3                           | DMO-210-001 | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Carbonate Alkalinity as CaCO3                           | 3812-32-6   | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Bicarbonate Alkalinity as CaCO3                         | 71-52-3     | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Total Alkalinity as CaCO3                               | ----        | 1    | mg/L | <1                          | 20 mg/L                               | 104                       | 81.2                              | 126  |
|                                                                  |             |      |      | <1                          | 200 mg/L                              | 102                       | 90.0                              | 110  |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4044099) |             |      |      |                             |                                       |                           |                                   |      |
| ED041G: Sulfate as SO4 - Turbidimetric                           | 14808-79-8  | 1    | mg/L | <1                          | 25 mg/L                               | 103                       | 87.7                              | 113  |
|                                                                  |             |      |      | <1                          | 500 mg/L                              | 107                       | 87.7                              | 113  |
| ED045G: Chloride by Discrete Analyser (QCLot: 4044098)           |             |      |      |                             |                                       |                           |                                   |      |
| ED045G: Chloride                                                 | 16887-00-6  | 1    | mg/L | <1                          | 10 mg/L                               | 106                       | 87.9                              | 114  |
|                                                                  |             |      |      | <1                          | 1000 mg/L                             | 107                       | 87.9                              | 114  |
| ED093F: Dissolved Major Cations (QCLot: 4045343)                 |             |      |      |                             |                                       |                           |                                   |      |
| ED093F: Calcium                                                  | 7440-70-2   | 1    | mg/L | <1                          | 50 mg/L                               | 98.6                      | 85.9                              | 113  |
| ED093F: Magnesium                                                | 7439-95-4   | 1    | mg/L | <1                          | 50 mg/L                               | 95.0                      | 88.0                              | 110  |
| ED093F: Sodium                                                   | 7440-23-5   | 1    | mg/L | <1                          | 50 mg/L                               | 107                       | 87.3                              | 118  |
| ED093F: Potassium                                                | 7440-09-7   | 1    | mg/L | <1                          | 50 mg/L                               | 92.4                      | 89.7                              | 108  |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4053879)           |             |      |      |                             |                                       |                           |                                   |      |
| EP231X: Perfluorobutane sulfonic acid (PFBS)                     | 375-73-5    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 100                       | 72.0                              | 130  |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)                   | 2706-91-4   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 110                       | 71.0                              | 127  |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)                    | 355-46-4    | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 113                       | 68.0                              | 131  |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)                   | 375-92-8    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 103                       | 69.0                              | 134  |
| EP231X: Perfluorooctane sulfonic acid (PFOS)                     | 1763-23-1   | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 102                       | 65.0                              | 140  |
| EP231X: Perfluorodecane sulfonic acid (PFDS)                     | 335-77-3    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 69.8                      | 53.0                              | 142  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4053879)         |             |      |      |                             |                                       |                           |                                   |      |
| 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                             | 116                       | 72.0                              | 129  |
| EP231X: Perfluorohexanoic acid (PFHxA)                           | 307-24-4    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 106                       | 72.0                              | 129  |
| EP231X: Perfluoroheptanoic acid (PFHpA)                          | 375-85-9    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 125                       | 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                             | 105                       | 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                             | 84.4                      | 69.0                              | 133  |
| EP231X: Perfluorododecanoic acid (PFDoDA)                        | 307-55-1    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 123                       | 72.0                              | 134  |



Sub-Matrix: **WATER**

| Sub-Matrix: WATER                                                    |             |      |      | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |     |
|----------------------------------------------------------------------|-------------|------|------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|-----|
|                                                                      |             |      |      |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |     |
| Method: Compound                                                     | CAS Number  | LOR  | Unit | Result                      |                                       |                           |                                   |     |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4053879) - continued |             |      |      |                             |                                       |                           |                                   |     |
| EP231X: Perfluorotridecanoic acid (PFTrDA)                           | 72629-94-8  | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 67.8                      | 65.0                              | 144 |
| EP231X: Perfluorotetradecanoic acid (PFTeDA)                         | 376-06-7    | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 124                       | 71.0                              | 132 |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4053879)                 |             |      |      |                             |                                       |                           |                                   |     |
| EP231X: Perfluorooctane sulfonamide (FOSA)                           | 754-91-6    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 116                       | 67.0                              | 137 |
| EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)                | 31506-32-8  | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 131                       | 68.0                              | 141 |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)                 | 4151-50-2   | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 104                       | 62.6                              | 147 |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)         | 24448-09-7  | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 134                       | 66.0                              | 145 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)          | 1691-99-2   | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 107                       | 57.6                              | 145 |
| EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)    | 2355-31-9   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 122                       | 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 |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4053879)          |             |      |      |                             |                                       |                           |                                   |     |
| EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                    | 757124-72-4 | 0.05 | µg/L | <0.05                       | 0.25 µg/L                             | 104                       | 63.0                              | 143 |
| EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                    | 27619-97-2  | 0.05 | µg/L | <0.05                       | 0.25 µg/L                             | 106                       | 64.0                              | 140 |
| EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                    | 39108-34-4  | 0.05 | µg/L | <0.05                       | 0.25 µg/L                             | 135                       | 67.0                              | 138 |
| EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)                  | 120226-60-0 | 0.05 | µg/L | <0.05                       | 0.25 µg/L                             | 78.0                      | 71.4                              | 144 |

## Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

|                                                                         |                   |                                                |            | Matrix Spike (MS) Report |                        |                       |      |
|-------------------------------------------------------------------------|-------------------|------------------------------------------------|------------|--------------------------|------------------------|-----------------------|------|
|                                                                         |                   |                                                |            | Spike<br>Concentration   | SpikeRecovery(%)<br>MS | Acceptable Limits (%) |      |
| Laboratory sample ID                                                    | Sample ID         | Method: Compound                               | CAS Number |                          |                        | Low                   | High |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4044099)</b> |                   |                                                |            |                          |                        |                       |      |
| EP2114471-001                                                           | Anonymous         | ED041G: Sulfate as SO4 - Turbidimetric         | 14808-79-8 | 100 mg/L                 | # Not Determined       | 70.0                  | 130  |
| <b>ED045G: Chloride by Discrete Analyser (QCLot: 4044098)</b>           |                   |                                                |            |                          |                        |                       |      |
| EP2114471-001                                                           | Anonymous         | ED045G: Chloride                               | 16887-00-6 | 1000 mg/L                | # Not Determined       | 70.0                  | 130  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4053879)</b>           |                   |                                                |            |                          |                        |                       |      |
| EP2114474-003                                                           | 0960_MW122_211125 | EP231X: Perfluorobutane sulfonic acid (PFBS)   | 375-73-5   | 0.25 µg/L                | 79.0                   | 72.0                  | 130  |
|                                                                         |                   | EP231X: Perfluoropentane sulfonic acid (PFPeS) | 2706-91-4  | 0.25 µg/L                | 106                    | 71.0                  | 127  |
|                                                                         |                   | EP231X: Perfluorohexane sulfonic acid (PFHxS)  | 355-46-4   | 0.25 µg/L                | 101                    | 68.0                  | 131  |
|                                                                         |                   | EP231X: Perfluoroheptane sulfonic acid (PFHpS) | 375-92-8   | 0.25 µg/L                | 91.4                   | 69.0                  | 134  |



Sub-Matrix: **WATER**

| 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: 4053879) - continued |                   |                                                                   |             |                          |                  |                       |      |
| EP2114474-003                                                      | 0960_MW122_211125 | EP231X: Perfluorooctane sulfonic acid (PFOS)                      | 1763-23-1   | 0.25 µg/L                | 91.8             | 65.0                  | 140  |
|                                                                    |                   | EP231X: Perfluorodecane sulfonic acid (PFDS)                      | 335-77-3    | 0.25 µg/L                | 91.8             | 53.0                  | 142  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4053879)           |                   |                                                                   |             |                          |                  |                       |      |
| EP2114474-003                                                      | 0960_MW122_211125 | EP231X: Perfluorobutanoic acid (PFBA)                             | 375-22-4    | 1.25 µg/L                | 101              | 73.0                  | 129  |
|                                                                    |                   | EP231X: Perfluoropentanoic acid (PFPeA)                           | 2706-90-3   | 0.25 µg/L                | 107              | 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                | 112              | 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                | 95.4             | 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                | 87.2             | 69.0                  | 133  |
|                                                                    |                   | EP231X: Perfluorododecanoic acid (PFDoDA)                         | 307-55-1    | 0.25 µg/L                | 106              | 72.0                  | 134  |
|                                                                    |                   | EP231X: Perfluorotridecanoic acid (PFTTrDA)                       | 72629-94-8  | 0.25 µg/L                | 99.4             | 65.0                  | 144  |
|                                                                    |                   | EP231X: Perfluorotetradecanoic acid (PFTeDA)                      | 376-06-7    | 0.625 µg/L               | 118              | 71.0                  | 132  |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4053879)               |                   |                                                                   |             |                          |                  |                       |      |
| EP2114474-003                                                      | 0960_MW122_211125 | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.25 µg/L                | 106              | 67.0                  | 137  |
|                                                                    |                   | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.625 µg/L               | 129              | 68.0                  | 141  |
|                                                                    |                   | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.625 µg/L               | 106              | 62.6                  | 147  |
|                                                                    |                   | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.625 µg/L               | 118              | 66.0                  | 145  |
|                                                                    |                   | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.625 µg/L               | 110              | 57.6                  | 145  |
|                                                                    |                   | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9   | 0.25 µg/L                | 111              | 65.0                  | 136  |
|                                                                    |                   | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.25 µg/L                | 86.6             | 61.0                  | 135  |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4053879)        |                   |                                                                   |             |                          |                  |                       |      |
| EP2114474-003                                                      | 0960_MW122_211125 | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.25 µg/L                | 94.2             | 63.0                  | 143  |
|                                                                    |                   | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 27619-97-2  | 0.25 µg/L                | 95.6             | 64.0                  | 140  |
|                                                                    |                   | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | 39108-34-4  | 0.25 µg/L                | 116              | 67.0                  | 138  |
|                                                                    |                   | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | 120226-60-0 | 0.25 µg/L                | 143              | 71.4                  | 144  |



## QA/QC Compliance Assessment to assist with Quality Review

|              |                       |                         |                                |
|--------------|-----------------------|-------------------------|--------------------------------|
| Work Order   | : EP2114474           | Page                    | : 1 of 5                       |
| Client       | : CARDNO (WA) PTY LTD | Laboratory              | : Environmental Division Perth |
| Contact      | : [REDACTED]          | Telephone               | : +61-8-9406 1301              |
| Project      | : WA_0960_PFASOMP     | Date Samples Received   | : 29-Nov-2021                  |
| Site         | : DEF19009/Learmonth  | Issue Date              | : 08-Dec-2021                  |
| Sampler      | : [REDACTED]          | No. of samples received | : 9                            |
| Order number | : DEF19009/0960       | No. of samples analysed | : 9                            |

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

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

### Summary of Outliers

#### Outliers : Quality Control Samples

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

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- Matrix Spike outliers exist - please see following pages for full details.
- For all regular sample matrices, **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                                                                                      |
|-------------------------------------------------------------|----------------------|------------------|--------------------------------------------------|------------|----------------|--------|----------------------------------------------------------------------------------------------|
| <b>Matrix Spike (MS) Recoveries</b>                         |                      |                  |                                                  |            |                |        |                                                                                              |
| ED041G: Sulfate (Turbidimetric) as SO <sub>4</sub> 2- by DA | EP2114471--001       | Anonymous        | <b>Sulfate as SO<sub>4</sub> - Turbidimetric</b> | 14808-79-8 | Not Determined | ----   | <b>MS recovery not determined, background level greater than or equal to 4x spike level.</b> |
| ED045G: Chloride by Discrete Analyser                       | EP2114471--001       | Anonymous        | <b>Chloride</b>                                  | 16887-00-6 | Not Determined | ----   | <b>MS recovery not determined, background level greater than or equal to 4x spike level.</b> |

## Analysis Holding Time Compliance

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

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

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

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

Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                          | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |                    |
|-------------------------------------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|--------------------|
| Container / Client Sample ID(s)                 |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |                    |
| ED037P: Alkalinity by PC Titrator               |             |                          |                    |            |               |                  |            |                    |
| Clear Plastic Bottle - Natural (ED037-P)        | 25-Nov-2021 | ----                     | ----               | ----       | 04-Dec-2021   | 09-Dec-2021      | ✔          |                    |
| 0960_MW139_211125,                              |             |                          |                    |            |               |                  |            | 0960_MW147_211125, |
| 0960_MW122_211125,                              |             |                          |                    |            |               |                  |            | 0960_MW164_211125, |
| 0960_MW211_211125,                              |             |                          |                    |            |               |                  |            | 0960_MW018_211125, |
| 0960_MW103_211125,                              |             |                          |                    |            |               |                  |            | 0060_MW104_211125, |
| 0960_MW124_211125                               |             |                          |                    |            |               |                  |            |                    |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA |             |                          |                    |            |               |                  |            |                    |
| Clear Plastic Bottle - Natural (ED041G)         | 25-Nov-2021 | ----                     | ----               | ----       | 06-Dec-2021   | 23-Dec-2021      | ✔          |                    |
| 0960_MW139_211125,                              |             |                          |                    |            |               |                  |            | 0960_MW147_211125, |
| 0960_MW122_211125,                              |             |                          |                    |            |               |                  |            | 0960_MW164_211125, |
| 0960_MW211_211125,                              |             |                          |                    |            |               |                  |            | 0960_MW018_211125, |
| 0960_MW103_211125,                              |             |                          |                    |            |               |                  |            | 0060_MW104_211125, |
| 0960_MW124_211125                               |             |                          |                    |            |               |                  |            |                    |
| ED045G: Chloride by Discrete Analyser           |             |                          |                    |            |               |                  |            |                    |
| Clear Plastic Bottle - Natural (ED045G)         | 25-Nov-2021 | ----                     | ----               | ----       | 06-Dec-2021   | 23-Dec-2021      | ✔          |                    |
| 0960_MW139_211125,                              |             |                          |                    |            |               |                  |            | 0960_MW147_211125, |
| 0960_MW122_211125,                              |             |                          |                    |            |               |                  |            | 0960_MW164_211125, |
| 0960_MW211_211125,                              |             |                          |                    |            |               |                  |            | 0960_MW018_211125, |
| 0960_MW103_211125,                              |             |                          |                    |            |               |                  |            | 0060_MW104_211125, |
| 0960_MW124_211125                               |             |                          |                    |            |               |                  |            |                    |



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                     |                    | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |
|--------------------------------------------|--------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|
| Container / Client Sample ID(s)            |                    |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| ED093F: Dissolved Major Cations            |                    |             |                          |                    |            |               |                  |            |
| Clear Plastic Bottle - Natural (ED093F)    |                    | 25-Nov-2021 | ----                     | ----               | ----       | 30-Nov-2021   | 02-Dec-2021      | ✓          |
| 0960_MW139_211125,                         | 0960_MW147_211125, |             |                          |                    |            |               |                  |            |
| 0960_MW122_211125,                         | 0960_MW164_211125, |             |                          |                    |            |               |                  |            |
| 0960_MW211_211125,                         | 0960_MW018_211125, |             |                          |                    |            |               |                  |            |
| 0960_MW103_211125,                         | 0060_MW104_211125, |             |                          |                    |            |               |                  |            |
| 0960_MW124_211125                          |                    |             |                          |                    |            |               |                  |            |
| EP231A: Perfluoroalkyl Sulfonic Acids      |                    |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                    |                    | 25-Nov-2021 | 06-Dec-2021              | 24-May-2022        | ✓          | 07-Dec-2021   | 24-May-2022      | ✓          |
| 0960_MW139_211125,                         | 0960_MW147_211125, |             |                          |                    |            |               |                  |            |
| 0960_MW122_211125,                         | 0960_MW164_211125, |             |                          |                    |            |               |                  |            |
| 0960_MW211_211125,                         | 0960_MW018_211125, |             |                          |                    |            |               |                  |            |
| 0960_MW103_211125,                         | 0060_MW104_211125, |             |                          |                    |            |               |                  |            |
| 0960_MW124_211125                          |                    |             |                          |                    |            |               |                  |            |
| EP231B: Perfluoroalkyl Carboxylic Acids    |                    |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                    |                    | 25-Nov-2021 | 06-Dec-2021              | 24-May-2022        | ✓          | 07-Dec-2021   | 24-May-2022      | ✓          |
| 0960_MW139_211125,                         | 0960_MW147_211125, |             |                          |                    |            |               |                  |            |
| 0960_MW122_211125,                         | 0960_MW164_211125, |             |                          |                    |            |               |                  |            |
| 0960_MW211_211125,                         | 0960_MW018_211125, |             |                          |                    |            |               |                  |            |
| 0960_MW103_211125,                         | 0060_MW104_211125, |             |                          |                    |            |               |                  |            |
| 0960_MW124_211125                          |                    |             |                          |                    |            |               |                  |            |
| EP231C: Perfluoroalkyl Sulfonamides        |                    |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                    |                    | 25-Nov-2021 | 06-Dec-2021              | 24-May-2022        | ✓          | 07-Dec-2021   | 24-May-2022      | ✓          |
| 0960_MW139_211125,                         | 0960_MW147_211125, |             |                          |                    |            |               |                  |            |
| 0960_MW122_211125,                         | 0960_MW164_211125, |             |                          |                    |            |               |                  |            |
| 0960_MW211_211125,                         | 0960_MW018_211125, |             |                          |                    |            |               |                  |            |
| 0960_MW103_211125,                         | 0060_MW104_211125, |             |                          |                    |            |               |                  |            |
| 0960_MW124_211125                          |                    |             |                          |                    |            |               |                  |            |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids |                    |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                    |                    | 25-Nov-2021 | 06-Dec-2021              | 24-May-2022        | ✓          | 07-Dec-2021   | 24-May-2022      | ✓          |
| 0960_MW139_211125,                         | 0960_MW147_211125, |             |                          |                    |            |               |                  |            |
| 0960_MW122_211125,                         | 0960_MW164_211125, |             |                          |                    |            |               |                  |            |
| 0960_MW211_211125,                         | 0960_MW018_211125, |             |                          |                    |            |               |                  |            |
| 0960_MW103_211125,                         | 0060_MW104_211125, |             |                          |                    |            |               |                  |            |
| 0960_MW124_211125                          |                    |             |                          |                    |            |               |                  |            |
| EP231P: PFAS Sums                          |                    |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                    |                    | 25-Nov-2021 | 06-Dec-2021              | 24-May-2022        | ✓          | 07-Dec-2021   | 24-May-2022      | ✓          |
| 0960_MW139_211125,                         | 0960_MW147_211125, |             |                          |                    |            |               |                  |            |
| 0960_MW122_211125,                         | 0960_MW164_211125, |             |                          |                    |            |               |                  |            |
| 0960_MW211_211125,                         | 0960_MW018_211125, |             |                          |                    |            |               |                  |            |
| 0960_MW103_211125,                         | 0060_MW104_211125, |             |                          |                    |            |               |                  |            |
| 0960_MW124_211125                          |                    |             |                          |                    |            |               |                  |            |



## Quality Control Parameter Frequency Compliance

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

Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

| Quality Control Sample Type                            |         | Count |         | Rate (%) |          | Quality Control Specification |                                |
|--------------------------------------------------------|---------|-------|---------|----------|----------|-------------------------------|--------------------------------|
| Analytical Methods                                     | Method  | QC    | Regular | Actual   | Expected |                               | Evaluation                     |
|                                                        |         |       |         |          |          |                               |                                |
| Laboratory Duplicates (DUP)                            |         |       |         |          |          |                               |                                |
| Alkalinity by PC Titrator                              | ED037-P | 2     | 19      | 10.53    | 10.00    | ✔                             | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 2     | 19      | 10.53    | 10.00    | ✔                             | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 2     | 20      | 10.00    | 10.00    | ✔                             | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 2     | 19      | 10.53    | 10.00    | ✔                             | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 2     | 19      | 10.53    | 10.00    | ✔                             | NEPM 2013 B3 & ALS QC Standard |
| Laboratory Control Samples (LCS)                       |         |       |         |          |          |                               |                                |
| Alkalinity by PC Titrator                              | ED037-P | 2     | 19      | 10.53    | 10.00    | ✔                             | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 2     | 19      | 10.53    | 10.00    | ✔                             | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 1     | 20      | 5.00     | 5.00     | ✔                             | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 19      | 5.26     | 5.00     | ✔                             | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 2     | 19      | 10.53    | 10.00    | ✔                             | NEPM 2013 B3 & ALS QC Standard |
| Method Blanks (MB)                                     |         |       |         |          |          |                               |                                |
| Alkalinity by PC Titrator                              | ED037-P | 1     | 19      | 5.26     | 5.00     | ✔                             | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 1     | 19      | 5.26     | 5.00     | ✔                             | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 1     | 20      | 5.00     | 5.00     | ✔                             | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 19      | 5.26     | 5.00     | ✔                             | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 1     | 19      | 5.26     | 5.00     | ✔                             | NEPM 2013 B3 & ALS QC Standard |
| Matrix Spikes (MS)                                     |         |       |         |          |          |                               |                                |
| Chloride by Discrete Analyser                          | ED045G  | 1     | 19      | 5.26     | 5.00     | ✔                             | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 19      | 5.26     | 5.00     | ✔                             | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 1     | 19      | 5.26     | 5.00     | ✔                             | NEPM 2013 B3 & ALS QC Standard |



## Brief Method Summaries

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

| Analytical Methods                                                 | Method       | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------------------|--------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alkalinity by PC Titrator                                          | ED037-P      | WATER  | In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                                                                                                                                                                                                                |
| Sulfate (Turbidimetric) as SO <sub>4</sub> 2- by Discrete Analyser | ED041G       | WATER  | In house: Referenced to APHA 4500-SO <sub>4</sub> . Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO <sub>4</sub> suspension is measured by a photometer and the SO <sub>4</sub> -2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                         |
| Chloride by Discrete Analyser                                      | ED045G       | WATER  | In house: Referenced to APHA 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA seal method 2 017-1-L                                                                                                                                                                                                                                                                                                                                      |
| Major Cations - Dissolved                                          | ED093F       | WATER  | In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                           |
| Ionic Balance by PCT DA and Turbi SO <sub>4</sub> DA               | * EN055 - PG | WATER  | In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS               | EP231X       | WATER  | In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements. |
| Preparation Methods                                                | Method       | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Solid Phase Extraction (SPE) for PFAS in water                     | ORG72        | WATER  | In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.                                                                                                                                                                                                |

**CHAIN OF CUSTODY**

COC#: 30678

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: CG - DEF19009/Learmonth SED

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:

/ ES2019CARBSD0002

**LABORATORY USE ONLY (Circle)**

Custody Seal intact? Yes 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 | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|------------|-------------|------------------------|--------|----------------------|---------|--------------------|----------------------|------------------------|
| 001    | 0960_SD199 |             | 25/11/2021<br>07:45 AM | Soil   | ALS: 2<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 002    | 0960_SD219 |             | 25/11/2021<br>10:08 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 003    | 0960_SS235 |             | 25/11/2021<br>10:18 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 004    | 0960_SS113 |             | 25/11/2021<br>11:15 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 005    | 0960_SS231 |             | 25/11/2021<br>11:38 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 006    | 0960_SS265 |             | 25/11/2021<br>11:46 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 007    | 0960_SS108 |             | 25/11/2021<br>12:17 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 008    | 0060_SS170 |             | 25/11/2021<br>12:24 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |



**CHAIN OF CUSTODY**

COC#: 30678

ALS Laboratory: EP Perth

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: CG - DEF19009/Learmonth SED

ORDER NO: DEF19009/0960

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

SAMPLER MOBILE:

/ ES2019CARBSD0002

**LABORATORY USE ONLY (Circle)**

Custody Seal intact?

Yes 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    | 0960_SD199  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 002    | 0960_SD219  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 003    | 0960_SS235  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 004    | 0960_SS113  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 005    | 0960_SS231  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 006    | 0960_SS265  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 007    | 0960_SS108  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 008    | 0060_SS170  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |

**CHAIN OF CUSTODY**

COC#: 30678

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: CG - DEF19009/Learmonth SED

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:

/ ES2019CARBSD0002

**LABORATORY USE ONLY (Circle)**

Custody Seal intact?

Yes 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    | 0960_SD199  | HDPE Soil Jar | 200 mL | 00621019097700 | Grey | No       |        |
| 001    | 0960_SD199  | HDPE Soil Jar | 200 mL | 00621019097723 | Grey | No       |        |
| 002    | 0960_SD219  | HDPE Soil Jar | 200 mL | 00621019097676 | Grey | No       |        |
| 003    | 0960_SS235  | HDPE Soil Jar | 200 mL | 00621019097727 | Grey | No       |        |
| 004    | 0960_SS113  | HDPE Soil Jar | 200 mL | 00621019097703 | Grey | No       |        |
| 005    | 0960_SS231  | HDPE Soil Jar | 200 mL | 00621019097677 | Grey | No       |        |
| 006    | 0960_SS265  | HDPE Soil Jar | 200 mL | 00621019097699 | Grey | No       |        |
| 007    | 0960_SS108  | HDPE Soil Jar | 200 mL | 00621019097749 | Grey | No       |        |
| 008    | 0060_SS170  | HDPE Soil Jar | 200 mL | 00621019097670 | Grey | No       |        |

**Total Bottle Count: ALS: 9, Non ALS: 0**

## SAMPLE RECEIPT NOTIFICATION (SRN)

**Work Order : EP2114475**

|                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Client : <b>CARDNO (WA) PTY LTD</b></p> <p>Contact : [REDACTED]</p> <p>Address : 11 HARVEST TERRACE PO BOX 155<br/>WEST PERTH WA, AUSTRALIA 6006</p> <p>E-mail : [REDACTED]@cardno.com.au</p> <p>Telephone : ----</p> <p>Facsimile : ----</p> <p>Project : WA_0960_PFASOMP</p> <p>Order number : DEF19009/0960</p> <p>C-O-C number : 30678</p> <p>Site : DEF19009/Learmonth</p> <p>Sampler : [REDACTED]</p> | <p>Laboratory : Environmental Division Perth</p> <p>Contact : Customer Services EP</p> <p>Address : 26 Rigali Way Wangara WA Australia<br/>6065</p> <p>E-mail : ALSEnviro.Perth@alsglobal.com</p> <p>Telephone : +61-8-9406 1301</p> <p>Facsimile : +61-8-9406 1399</p> <p>Page : 1 of 2</p> <p>Quote number : ES2019CARBSD0002 (SY/139/19)</p> <p>QC Level : NEPM 2013 B3 &amp; ALS QC Standard</p> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Dates

|                                           |                                               |
|-------------------------------------------|-----------------------------------------------|
| Date Samples Received : 29-Nov-2021 11:30 | Issue Date : 29-Nov-2021                      |
| Client Requested Due Date : 08-Dec-2021   | Scheduled Reporting Date : <b>08-Dec-2021</b> |

### Delivery Details

|                            |                                            |
|----------------------------|--------------------------------------------|
| Mode of Delivery : Carrier | Security Seal : Not Available              |
| No. of coolers/boxes : 2   | Temperature : 23.1 - Ice present           |
| Receipt Detail :           | No. of samples received / analysed : 8 / 8 |

### General Comments

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



## Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exists.

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: SOIL

| Laboratory sample ID | Sampling date / time | Sample ID         | SOIL - EA055-103 Moisture Content | SOIL - EP231X (solids) PFAS - Full Suite (28 analytes) |
|----------------------|----------------------|-------------------|-----------------------------------|--------------------------------------------------------|
| EP2114475-001        | 25-Nov-2021 07:45    | 0960_SD199_211125 | ✓                                 | ✓                                                      |
| EP2114475-002        | 25-Nov-2021 10:08    | 0960_SD219_211125 | ✓                                 | ✓                                                      |
| EP2114475-003        | 25-Nov-2021 10:18    | 0960_SS235_211125 | ✓                                 | ✓                                                      |
| EP2114475-004        | 25-Nov-2021 11:15    | 0960_SS113_211125 | ✓                                 | ✓                                                      |
| EP2114475-005        | 25-Nov-2021 11:38    | 0960_SS231_211125 | ✓                                 | ✓                                                      |
| EP2114475-006        | 25-Nov-2021 11:46    | 0960_SS265_211125 | ✓                                 | ✓                                                      |
| EP2114475-007        | 25-Nov-2021 12:17    | 0960_SS108_211125 | ✓                                 | ✓                                                      |
| EP2114475-008        | 25-Nov-2021 12:24    | 0060_SS170_211125 | ✓                                 | ✓                                                      |

## Proactive Holding Time Report

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

## Requested Deliverables

- A4 - AU Tax Invoice (INV)

Email [REDACTED]@cardno.com.au

### DERP LAB REPORTS

- EDI Format - ESDAT (ESDAT)

Email derp.labreports@esdat.com.au

- \*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 - ESDAT (ESDAT)
- EDI Format - XTab (XTAB)

Email [REDACTED]@cardno.com.au  
Email [REDACTED]@cardno.com.au  
Email [REDACTED]@cardno.com.au  
Email [REDACTED]@cardno.com.au  
Email [REDACTED]@cardno.com.au  
Email [REDACTED]@cardno.com.au  
Email [REDACTED]@cardno.com.au

### Perth

- A4 - AU Tax Invoice (INV)

Email perth@cardno.com.au

## CERTIFICATE OF ANALYSIS

**Work Order** : **EP2114475**  
**Client** : **CARDNO (WA) PTY LTD**  
**Contact** : [REDACTED]  
**Address** : 11 HARVEST TERRACE PO BOX 155  
 WEST PERTH WA, AUSTRALIA 6006  
**Telephone** : ----  
**Project** : WA\_0960\_PFASOMP  
**Order number** : DEF19009/0960  
**C-O-C number** : 30678  
**Sampler** : [REDACTED]  
**Site** : DEF19009/Learmonth  
**Quote number** : SY/139/19  
**No. of samples received** : 8  
**No. of samples analysed** : 8

**Page** : 1 of 7  
**Laboratory** : Environmental Division Perth  
**Contact** : Customer Services EP  
**Address** : 26 Rigali Way Wangara WA Australia 6065  
**Telephone** : +61-8-9406 1301  
**Date Samples Received** : 29-Nov-2021 11:30  
**Date Analysis Commenced** : 06-Dec-2021  
**Issue Date** : 08-Dec-2021 12:34



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>      |
|------------------------------------------------------------------------|------------------|------------------------------------|
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator | Sydney Inorganics, Smithfield, NSW |
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator | Sydney Organics, Smithfield, NSW   |



## 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.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- 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

|                                                    |            |        |       | 0960_SD199_211125 | 0960_SD219_211125 | 0960_SS235_211125 | 0960_SS113_211125 | 0960_SS231_211125 |
|----------------------------------------------------|------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                               |            |        |       | 25-Nov-2021 07:45 | 25-Nov-2021 10:08 | 25-Nov-2021 10:18 | 25-Nov-2021 11:15 | 25-Nov-2021 11:38 |
| Compound                                           | CAS Number | LOR    | Unit  | EP2114475-001     | EP2114475-002     | EP2114475-003     | EP2114475-004     | EP2114475-005     |
|                                                    |            |        |       | Result            | Result            | Result            | Result            | Result            |
| <b>EA055: Moisture Content (Dried @ 105-110°C)</b> |            |        |       |                   |                   |                   |                   |                   |
| Moisture Content                                   | ----       | 0.1    | %     | 11.0              | 1.5               | 2.6               | 2.4               | 1.9               |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>       |            |        |       |                   |                   |                   |                   |                   |
| 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            | 0.0009            | 0.0159            | 0.0064            | 0.0341            |
| Perfluorodecane sulfonic acid (PFDS)               | 335-77-3   | 0.0002 | mg/kg | <0.0002           | <0.0002           | <0.0002           | 0.0006            | <0.0002           |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>     |            |        |       |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>         |            |        |       |                   |                   |                   |                   |                   |
| 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<br>(Matrix: SOIL)                    |                    |        |       | Sample ID | 0960_SD199_211125 | 0960_SD219_211125 | 0960_SS235_211125 | 0960_SS113_211125 | 0960_SS231_211125 |
|-----------------------------------------------------------|--------------------|--------|-------|-----------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                      |                    |        |       |           | 25-Nov-2021 07:45 | 25-Nov-2021 10:08 | 25-Nov-2021 10:18 | 25-Nov-2021 11:15 | 25-Nov-2021 11:38 |
| Compound                                                  | CAS Number         | LOR    | Unit  |           | EP2114475-001     | EP2114475-002     | EP2114475-003     | EP2114475-004     | EP2114475-005     |
|                                                           |                    |        |       | Result    | Result            | Result            | Result            | Result            | Result            |
| <b>EP231C: Perfluoroalkyl Sulfonamides - Continued</b>    |                    |        |       |           |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>         |                    |        |       |           |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231P: PFAS Sums</b>                                  |                    |        |       |           |                   |                   |                   |                   |                   |
| Sum of PFAS                                               | ----               | 0.0002 | mg/kg | 0.0003    | 0.0009            | 0.0159            | 0.0070            | 0.0343            |                   |
| Sum of PFHxS and PFOS                                     | 355-46-4/1763-23-1 | 0.0002 | mg/kg | 0.0003    | 0.0009            | 0.0159            | 0.0064            | 0.0341            |                   |
| Sum of PFAS (WA DER List)                                 | ----               | 0.0002 | mg/kg | 0.0003    | 0.0009            | 0.0159            | 0.0064            | 0.0341            |                   |
| <b>EP231S: PFAS Surrogate</b>                             |                    |        |       |           |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                 | ----               | 0.0002 | %     | 97.0      | 119               | 110               | 102               | 104               |                   |
| 13C8-PFOA                                                 | ----               | 0.0002 | %     | 102       | 106               | 112               | 89.5              | 114               |                   |



## Analytical Results

Sub-Matrix: SEDIMENT  
 (Matrix: SOIL)

Sample ID

|                                                    |            |        |       | 0960_SS265_211125 | 0960_SS108_211125 | 0060_SS170_211125 | ----  | ----  |
|----------------------------------------------------|------------|--------|-------|-------------------|-------------------|-------------------|-------|-------|
| Sampling date / time                               |            |        |       | 25-Nov-2021 11:46 | 25-Nov-2021 12:17 | 25-Nov-2021 12:24 | ----  | ----  |
| Compound                                           | CAS Number | LOR    | Unit  | EP2114475-006     | EP2114475-007     | EP2114475-008     | ----- | ----- |
|                                                    |            |        |       | Result            | Result            | Result            | ----  | ----  |
| <b>EA055: Moisture Content (Dried @ 105-110°C)</b> |            |        |       |                   |                   |                   |       |       |
| Moisture Content                                   | ----       | 0.1    | %     | 2.1               | 6.6               | 5.7               | ----  | ----  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>       |            |        |       |                   |                   |                   |       |       |
| 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 | 0.0004            | <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 | 0.0161            | 0.0042            | 0.0055            | ----  | ----  |
| Perfluorodecane sulfonic acid (PFDS)               | 335-77-3   | 0.0002 | mg/kg | 0.0004            | 0.0007            | 0.0003            | ----  | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>     |            |        |       |                   |                   |                   |       |       |
| 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 | 0.0004            | <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           | ----  | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>         |            |        |       |                   |                   |                   |       |       |
| 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<br>(Matrix: SOIL)                    |                    |        |       | Sample ID | 0960_SS265_211125 | 0960_SS108_211125 | 0060_SS170_211125 | ----  | ----  |
|-----------------------------------------------------------|--------------------|--------|-------|-----------|-------------------|-------------------|-------------------|-------|-------|
| Sampling date / time                                      |                    |        |       |           | 25-Nov-2021 11:46 | 25-Nov-2021 12:17 | 25-Nov-2021 12:24 | ----  | ----  |
| Compound                                                  | CAS Number         | LOR    | Unit  |           | EP2114475-006     | EP2114475-007     | EP2114475-008     | ----- | ----- |
|                                                           |                    |        |       | Result    | Result            | Result            | Result            | ----  | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides - Continued</b>    |                    |        |       |           |                   |                   |                   |       |       |
| 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           | ----  | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>         |                    |        |       |           |                   |                   |                   |       |       |
| 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           | ----  | ----  |
| <b>EP231P: PFAS Sums</b>                                  |                    |        |       |           |                   |                   |                   |       |       |
| Sum of PFAS                                               | ----               | 0.0002 | mg/kg | 0.0173    | 0.0049            | 0.0058            | 0.0058            | ----  | ----  |
| Sum of PFHxS and PFOS                                     | 355-46-4/1763-23-1 | 0.0002 | mg/kg | 0.0165    | 0.0042            | 0.0055            | 0.0055            | ----  | ----  |
| Sum of PFAS (WA DER List)                                 | ----               | 0.0002 | mg/kg | 0.0165    | 0.0042            | 0.0055            | 0.0055            | ----  | ----  |
| <b>EP231S: PFAS Surrogate</b>                             |                    |        |       |           |                   |                   |                   |       |       |
| 13C4-PFOS                                                 | ----               | 0.0002 | %     | 99.0      | 104               | 108               | 108               | ----  | ----  |
| 13C8-PFOA                                                 | ----               | 0.0002 | %     | 102       | 95.0              | 95.0              | 95.0              | ----  | ----  |

Page : 7 of 7  
Work Order : EP2114475  
Client : CARDNO (WA) PTY LTD  
Project : WA\_0960\_PFASOMP



## Surrogate Control Limits

| Sub-Matrix: <b>SEDIMENT</b>   |            | Recovery Limits (%) |      |
|-------------------------------|------------|---------------------|------|
| Compound                      | CAS Number | Low                 | High |
| <b>EP231S: PFAS Surrogate</b> |            |                     |      |
| <b>13C4-PFOS</b>              | ----       | 60                  | 120  |
| <b>13C8-PFOA</b>              | ----       | 60                  | 120  |

## Inter-Laboratory Testing

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

(SOIL) EP231A: Perfluoroalkyl Sulfonic Acids

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

(SOIL) EP231C: Perfluoroalkyl Sulfonamides

(SOIL) EP231B: Perfluoroalkyl Carboxylic Acids

(SOIL) EP231P: PFAS Sums

(SOIL) EP231S: PFAS Surrogate

(SOIL) EA055: Moisture Content (Dried @ 105-110°C)

## QUALITY CONTROL REPORT

|                                |                                                                          |                                |                                                  |
|--------------------------------|--------------------------------------------------------------------------|--------------------------------|--------------------------------------------------|
| <b>Work Order</b>              | <b>: EP2114475</b>                                                       | <b>Page</b>                    | <b>: 1 of 7</b>                                  |
| <b>Client</b>                  | <b>: CARDNO (WA) PTY LTD</b>                                             | <b>Laboratory</b>              | <b>: Environmental Division Perth</b>            |
| <b>Contact</b>                 | <b>: [REDACTED]</b>                                                      | <b>Contact</b>                 | <b>: Customer Services EP</b>                    |
| <b>Address</b>                 | <b>: 11 HARVEST TERRACE PO BOX 155<br/>WEST PERTH WA, AUSTRALIA 6006</b> | <b>Address</b>                 | <b>: 26 Rigali Way Wangara WA Australia 6065</b> |
| <b>Telephone</b>               | <b>: ----</b>                                                            | <b>Telephone</b>               | <b>: +61-8-9406 1301</b>                         |
| <b>Project</b>                 | <b>: WA_0960_PFASOMP</b>                                                 | <b>Date Samples Received</b>   | <b>: 29-Nov-2021</b>                             |
| <b>Order number</b>            | <b>: DEF19009/0960</b>                                                   | <b>Date Analysis Commenced</b> | <b>: 06-Dec-2021</b>                             |
| <b>C-O-C number</b>            | <b>: 30678</b>                                                           | <b>Issue Date</b>              | <b>: 08-Dec-2021</b>                             |
| <b>Sampler</b>                 | <b>: [REDACTED]</b>                                                      |                                |                                                  |
| <b>Site</b>                    | <b>: DEF19009/Learmonth</b>                                              |                                |                                                  |
| <b>Quote number</b>            | <b>: SY/139/19</b>                                                       |                                |                                                  |
| <b>No. of samples received</b> | <b>: 8</b>                                                               |                                |                                                  |
| <b>No. of samples analysed</b> | <b>: 8</b>                                                               |                                |                                                  |



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]  | LCMS Coordinator | Sydney Inorganics, Smithfield, NSW |
| [REDACTED]  | LCMS Coordinator | Sydney Organics, Smithfield, NSW   |





## 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**

| Sub-Matrix: <b>SOIL</b>                                       |                   |                                                |            | 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: 4056871) |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2114396-010                                                 | Anonymous         | EA055: Moisture Content                        | ----       | 0.1                               | %     | 22.9            | 23.3             | 1.9     | 0% - 20%           |
| EP2114475-001                                                 | 0960_SD199_211125 | EA055: Moisture Content                        | ----       | 0.1                               | %     | 11.0            | 10.8             | 1.5     | 0% - 20%           |
| EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4056872) |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2114476-002                                                 | Anonymous         | EA055: Moisture Content                        | ----       | 0.1                               | %     | 1.7             | 1.5              | 11.6    | 0% - 50%           |
| ES2144168-001                                                 | Anonymous         | EA055: Moisture Content                        | ----       | 0.1                               | %     | 24.9            | 24.1             | 3.0     | 0% - 20%           |
| EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4056114)       |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2114475-001                                                 | 0960_SD199_211125 | 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           |
| EP2114476-003                                                 | Anonymous         | EP231X: Perfluorobutane sulfonic acid (PFBS)   | 375-73-5   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                               |                   | EP231X: Perfluoropentane sulfonic acid (PFPeS) | 2706-91-4  | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                               |                   | EP231X: Perfluorohexane sulfonic acid (PFHxS)  | 355-46-4   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                               |                   | EP231X: Perfluoroheptane sulfonic acid (PFHpS) | 375-92-8   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                               |                   | EP231X: Perfluorooctane sulfonic acid (PFOS)   | 1763-23-1  | 0.0002                            | mg/kg | 0.0011          | 0.0013           | 12.1    | 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: 4056114)     |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2114475-001                                                 | 0960_SD199_211125 | EP231X: Perfluoropentanoic acid (PFPeA)        | 2706-90-3  | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                               |                   | EP231X: Perfluorohexanoic acid (PFHxA)         | 307-24-4   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                               |                   | EP231X: Perfluoroheptanoic acid (PFHpA)        | 375-85-9   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                               |                   | EP231X: Perfluorooctanoic acid (PFOA)          | 335-67-1   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |



| Sub-Matrix: SOIL                                                      |                   |                                                                   |            | Laboratory Duplicate (DUP) Report |       |                 |                  |         |                    |
|-----------------------------------------------------------------------|-------------------|-------------------------------------------------------------------|------------|-----------------------------------|-------|-----------------|------------------|---------|--------------------|
| Laboratory sample ID                                                  | Sample ID         | Method: Compound                                                  | CAS Number | LOR                               | Unit  | Original Result | Duplicate Result | RPD (%) | Acceptable RPD (%) |
| EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4056114) - continued |                   |                                                                   |            |                                   |       |                 |                  |         |                    |
| EP2114475-001                                                         | 0960_SD199_211125 | 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           |
| EP2114476-003                                                         | Anonymous         | EP231X: Perfluoropentanoic acid (PFPeA)                           | 2706-90-3  | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                       |                   | EP231X: Perfluorohexanoic acid (PFHxA)                            | 307-24-4   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                       |                   | EP231X: Perfluoroheptanoic acid (PFHpA)                           | 375-85-9   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                       |                   | EP231X: Perfluorooctanoic acid (PFOA)                             | 335-67-1   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                       |                   | EP231X: Perfluorononanoic acid (PFNA)                             | 375-95-1   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                       |                   | EP231X: Perfluorodecanoic acid (PFDA)                             | 335-76-2   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                       |                   | EP231X: Perfluoroundecanoic acid (PFUnDA)                         | 2058-94-8  | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                       |                   | EP231X: Perfluorododecanoic acid (PFDoDA)                         | 307-55-1   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                       |                   | EP231X: Perfluorotridecanoic acid (PFTrDA)                        | 72629-94-8 | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                       |                   | EP231X: Perfluorotetradecanoic acid (PFTeDA)                      | 376-06-7   | 0.0005                            | mg/kg | <0.0005         | <0.0005          | 0.0     | No Limit           |
|                                                                       |                   | EP231X: Perfluorobutanoic acid (PFBA)                             | 375-22-4   | 0.001                             | mg/kg | <0.001          | <0.001           | 0.0     | No Limit           |
|                                                                       |                   | EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4056114)             |            |                                   |       |                 |                  |         |                    |
| EP2114475-001                                                         | 0960_SD199_211125 | 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           |
| EP2114476-003                                                         | Anonymous         | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                       |                   | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9  | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                       |                   | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6  | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                       |                   | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8 | 0.0005                            | mg/kg | <0.0005         | <0.0005          | 0.0     | No Limit           |
|                                                                       |                   | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2  | 0.0005                            | mg/kg | <0.0005         | <0.0005          | 0.0     | No Limit           |

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 Work Order : EP2114475  
 Client : CARDNO (WA) PTY LTD  
 Project : WA\_0960\_PFASOMP



| 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: 4056114) - continued |                   |                                                              |             |                                   |       |                 |                  |         |                    |
| EP2114476-003                                                     | Anonymous         | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE) | 24448-09-7  | 0.0005                            | mg/kg | <0.0005         | <0.0005          | 0.0     | No Limit           |
|                                                                   |                   | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)  | 1691-99-2   | 0.0005                            | mg/kg | <0.0005         | <0.0005          | 0.0     | No Limit           |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4056114)      |                   |                                                              |             |                                   |       |                 |                  |         |                    |
| EP2114475-001                                                     | 0960_SD199_211125 | 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           |
| EP2114476-003                                                     | Anonymous         | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)            | 757124-72-4 | 0.0005                            | mg/kg | <0.0005         | <0.0005          | 0.0     | No Limit           |
|                                                                   |                   | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)            | 27619-97-2  | 0.0005                            | mg/kg | <0.0005         | <0.0005          | 0.0     | No Limit           |
|                                                                   |                   | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)            | 39108-34-4  | 0.0005                            | mg/kg | <0.0005         | <0.0005          | 0.0     | No Limit           |
|                                                                   |                   | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)          | 120226-60-0 | 0.0005                            | mg/kg | <0.0005         | <0.0005          | 0.0     | No Limit           |



## 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**

| Sub-Matrix: SOIL                                                  |             |        |       | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |     |
|-------------------------------------------------------------------|-------------|--------|-------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|-----|
|                                                                   |             |        |       |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |     |
| Method: Compound                                                  | CAS Number  | LOR    | Unit  | Result                      |                                       |                           |                                   |     |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4056114)            |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: Perfluorobutane sulfonic acid (PFBS)                      | 375-73-5    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 92.4                      | 72.0                              | 128 |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)                    | 2706-91-4   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 92.0                      | 73.0                              | 123 |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)                     | 355-46-4    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 89.2                      | 67.0                              | 130 |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)                    | 375-92-8    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 88.4                      | 70.0                              | 132 |
| EP231X: Perfluorooctane sulfonic acid (PFOS)                      | 1763-23-1   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 91.6                      | 68.0                              | 136 |
| EP231X: Perfluorodecane sulfonic acid (PFDS)                      | 335-77-3    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 92.4                      | 59.0                              | 134 |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4056114)          |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: Perfluorobutanoic acid (PFBA)                             | 375-22-4    | 0.001  | mg/kg | <0.001                      | 0.00625 mg/kg                         | 97.8                      | 71.0                              | 135 |
| EP231X: Perfluoropentanoic acid (PFPeA)                           | 2706-90-3   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 99.6                      | 69.0                              | 132 |
| EP231X: Perfluorohexanoic acid (PFHxA)                            | 307-24-4    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 104                       | 70.0                              | 132 |
| EP231X: Perfluoroheptanoic acid (PFHpA)                           | 375-85-9    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 104                       | 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                         | 98.4                      | 72.0                              | 129 |
| EP231X: Perfluorodecanoic acid (PFDA)                             | 335-76-2    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 97.2                      | 69.0                              | 133 |
| EP231X: Perfluoroundecanoic acid (PFUnDA)                         | 2058-94-8   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 87.2                      | 64.0                              | 136 |
| EP231X: Perfluorododecanoic acid (PFDoDA)                         | 307-55-1    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 103                       | 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                         | 111                       | 69.0                              | 133 |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4056114)              |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 111                       | 67.0                              | 137 |
| EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 113                       | 71.6                              | 129 |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 92.3                      | 69.8                              | 131 |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 114                       | 68.7                              | 130 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 107                       | 65.1                              | 134 |
| EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 96.4                      | 63.0                              | 144 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 90.8                      | 61.0                              | 139 |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4056114)       |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.0005 | mg/kg | <0.0005                     | 0.00125 mg/kg                         | 112                       | 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                         | 112                       | 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                         | 102                       | 65.0                              | 137 |



| Sub-Matrix: SOIL                                                        |             |        |       | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                       |      |
|-------------------------------------------------------------------------|-------------|--------|-------|-----------------------------|---------------------------------------|---------------------------|-----------------------|------|
|                                                                         |             |        |       |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%) |      |
| Method: Compound                                                        | CAS Number  | LOR    | Unit  | Result                      |                                       |                           | Low                   | High |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4056114) - continued |             |        |       |                             |                                       |                           |                       |      |
| EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)                     | 120226-60-0 | 0.0005 | mg/kg | <0.0005                     | 0.00125 mg/kg                         | 85.2                      | 69.2                  | 143  |

## 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                                         |                   |                                                                   |            | 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: 4056114)   |                   |                                                                   |            |                          |                  |                       |      |
| EP2114475-001                                            | 0960_SD199_211125 | EP231X: Perfluorobutane sulfonic acid (PFBS)                      | 375-73-5   | 0.00125 mg/kg            | 92.8             | 72.0                  | 128  |
|                                                          |                   | EP231X: Perfluoropentane sulfonic acid (PFPeS)                    | 2706-91-4  | 0.00125 mg/kg            | 98.0             | 73.0                  | 123  |
|                                                          |                   | EP231X: Perfluorohexane sulfonic acid (PFHxS)                     | 355-46-4   | 0.00125 mg/kg            | 104              | 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            | 88.4             | 68.0                  | 136  |
|                                                          |                   | EP231X: Perfluorodecane sulfonic acid (PFDS)                      | 335-77-3   | 0.00125 mg/kg            | 101              | 59.0                  | 134  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4056114) |                   |                                                                   |            |                          |                  |                       |      |
| EP2114475-001                                            | 0960_SD199_211125 | EP231X: Perfluorobutanoic acid (PFBA)                             | 375-22-4   | 0.00625 mg/kg            | 77.8             | 71.0                  | 135  |
|                                                          |                   | EP231X: Perfluoropentanoic acid (PFPeA)                           | 2706-90-3  | 0.00125 mg/kg            | 105              | 69.0                  | 132  |
|                                                          |                   | EP231X: Perfluorohexanoic acid (PFHxA)                            | 307-24-4   | 0.00125 mg/kg            | 112              | 70.0                  | 132  |
|                                                          |                   | EP231X: Perfluoroheptanoic acid (PFHpA)                           | 375-85-9   | 0.00125 mg/kg            | 116              | 71.0                  | 131  |
|                                                          |                   | EP231X: Perfluorooctanoic acid (PFOA)                             | 335-67-1   | 0.00125 mg/kg            | 106              | 69.0                  | 133  |
|                                                          |                   | EP231X: Perfluorononanoic acid (PFNA)                             | 375-95-1   | 0.00125 mg/kg            | 97.6             | 72.0                  | 129  |
|                                                          |                   | EP231X: Perfluorodecanoic acid (PFDA)                             | 335-76-2   | 0.00125 mg/kg            | 94.8             | 69.0                  | 133  |
|                                                          |                   | EP231X: Perfluoroundecanoic acid (PFUnDA)                         | 2058-94-8  | 0.00125 mg/kg            | 84.8             | 64.0                  | 136  |
|                                                          |                   | EP231X: Perfluorododecanoic acid (PFDoDA)                         | 307-55-1   | 0.00125 mg/kg            | 105              | 69.0                  | 135  |
|                                                          |                   | EP231X: Perfluorotridecanoic acid (PFTTrDA)                       | 72629-94-8 | 0.00125 mg/kg            | 108              | 66.0                  | 139  |
|                                                          |                   | EP231X: Perfluorotetradecanoic acid (PFTeDA)                      | 376-06-7   | 0.00312 mg/kg            | 114              | 69.0                  | 133  |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4056114)     |                   |                                                                   |            |                          |                  |                       |      |
| EP2114475-001                                            | 0960_SD199_211125 | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6   | 0.00125 mg/kg            | 114              | 67.0                  | 137  |
|                                                          |                   | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8 | 0.00312 mg/kg            | 112              | 71.6                  | 129  |
|                                                          |                   | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2  | 0.00312 mg/kg            | 97.4             | 69.8                  | 131  |
|                                                          |                   | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7 | 0.00312 mg/kg            | 109              | 68.7                  | 130  |
|                                                          |                   | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2  | 0.00312 mg/kg            | 113              | 65.1                  | 134  |
|                                                          |                   | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9  | 0.00125 mg/kg            | 101              | 63.0                  | 144  |



Sub-Matrix: SOIL

| Laboratory sample IDSample IDMethod: CompoundCAS Number          |                   |                                                                  |             | Matrix Spike (MS) Report |                  |                       |      |
|------------------------------------------------------------------|-------------------|------------------------------------------------------------------|-------------|--------------------------|------------------|-----------------------|------|
|                                                                  |                   |                                                                  |             | Spike                    | SpikeRecovery(%) | Acceptable Limits (%) |      |
|                                                                  |                   |                                                                  |             | Concentration            | MS               | Low                   | High |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4056114) - continued |                   |                                                                  |             |                          |                  |                       |      |
| EP2114475-001                                                    | 0960_SD199_211125 | 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: 4056114)      |                   |                                                                  |             |                          |                  |                       |      |
| EP2114475-001                                                    | 0960_SD199_211125 | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                | 757124-72-4 | 0.00125 mg/kg            | 113              | 62.0                  | 145  |
|                                                                  |                   | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                | 27619-97-2  | 0.00125 mg/kg            | 118              | 64.0                  | 140  |
|                                                                  |                   | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                | 39108-34-4  | 0.00125 mg/kg            | 108              | 65.0                  | 137  |
|                                                                  |                   | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)              | 120226-60-0 | 0.00125 mg/kg            | # 48.8           | 69.2                  | 143  |



## QA/QC Compliance Assessment to assist with Quality Review

|              |                       |                         |                                |
|--------------|-----------------------|-------------------------|--------------------------------|
| Work Order   | : EP2114475           | Page                    | : 1 of 5                       |
| Client       | : CARDNO (WA) PTY LTD | Laboratory              | : Environmental Division Perth |
| Contact      | : [REDACTED]          | Telephone               | : +61-8-9406 1301              |
| Project      | : WA_0960_PFASOMP     | Date Samples Received   | : 29-Nov-2021                  |
| Site         | : DEF19009/Learmonth  | Issue Date              | : 08-Dec-2021                  |
| Sampler      | : [REDACTED]          | No. of samples received | : 8                            |
| Order number | : DEF19009/0960       | No. of samples analysed | : 8                            |

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

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

### Summary of Outliers

#### Outliers : Quality Control Samples

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

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

#### Outliers : Analysis Holding Time Compliance

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

#### Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Page : 2 of 5  
 Work Order : EP2114475  
 Client : CARDNO (WA) PTY LTD  
 Project : WA\_0960\_PFASOMP



### 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                                                |
|--------------------------------------------|----------------------|-------------------|----------------------------------------------------|-------------|--------|-----------|--------------------------------------------------------|
| <b>Matrix Spike (MS) Recoveries</b>        |                      |                   |                                                    |             |        |           |                                                        |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids | EP2114475--001       | 0960_SD199_211125 | <b>10:2 Fluorotelomer sulfonic acid (10:2 FTS)</b> | 120226-60-0 | 48.8 % | 69.2-143% | <b>Recovery less than lower data quality objective</b> |

### 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      |                  |             |   |
|----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------|--------------------|-------------|---------------|------------------|-------------|---|
| Container / Client Sample ID(s)                                                                                |                                                                                     | Date extracted           | Due for extraction | Evaluation  | Date analysed | Due for analysis | Evaluation  |   |
| EA055: Moisture Content (Dried @ 105-110°C)                                                                    |                                                                                     |                          |                    |             |               |                  |             |   |
| HDPE Soil Jar (EA055)<br>0960_SD199_211125,<br>0960_SS235_211125,<br>0960_SS231_211125,<br>0960_SS108_211125,  | 0960_SD219_211125,<br>0960_SS113_211125,<br>0960_SS265_211125,<br>0060_SS170_211125 | 25-Nov-2021              | ----               | ----        | ----          | 06-Dec-2021      | 09-Dec-2021 | ✓ |
| EP231A: Perfluoroalkyl Sulfonic Acids                                                                          |                                                                                     |                          |                    |             |               |                  |             |   |
| HDPE Soil Jar (EP231X)<br>0960_SD199_211125,<br>0960_SS235_211125,<br>0960_SS231_211125,<br>0960_SS108_211125, | 0960_SD219_211125,<br>0960_SS113_211125,<br>0960_SS265_211125,<br>0060_SS170_211125 | 25-Nov-2021              | 06-Dec-2021        | 24-May-2022 | ✓             | 07-Dec-2021      | 15-Jan-2022 | ✓ |
| EP231B: Perfluoroalkyl Carboxylic Acids                                                                        |                                                                                     |                          |                    |             |               |                  |             |   |
| HDPE Soil Jar (EP231X)<br>0960_SD199_211125,<br>0960_SS235_211125,<br>0960_SS231_211125,<br>0960_SS108_211125, | 0960_SD219_211125,<br>0960_SS113_211125,<br>0960_SS265_211125,<br>0060_SS170_211125 | 25-Nov-2021              | 06-Dec-2021        | 24-May-2022 | ✓             | 07-Dec-2021      | 15-Jan-2022 | ✓ |
| EP231C: Perfluoroalkyl Sulfonamides                                                                            |                                                                                     |                          |                    |             |               |                  |             |   |
| HDPE Soil Jar (EP231X)<br>0960_SD199_211125,<br>0960_SS235_211125,<br>0960_SS231_211125,<br>0960_SS108_211125, | 0960_SD219_211125,<br>0960_SS113_211125,<br>0960_SS265_211125,<br>0060_SS170_211125 | 25-Nov-2021              | 06-Dec-2021        | 24-May-2022 | ✓             | 07-Dec-2021      | 15-Jan-2022 | ✓ |

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                     |                    | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |
|--------------------------------------------|--------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|
| Container / Client Sample ID(s)            |                    |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids |                    |             |                          |                    |            |               |                  |            |
| HDPE Soil Jar (EP231X)                     |                    | 25-Nov-2021 | 06-Dec-2021              | 24-May-2022        | ✓          | 07-Dec-2021   | 15-Jan-2022      | ✓          |
| 0960_SD199_211125,                         | 0960_SD219_211125, |             |                          |                    |            |               |                  |            |
| 0960_SS235_211125,                         | 0960_SS113_211125, |             |                          |                    |            |               |                  |            |
| 0960_SS231_211125,                         | 0960_SS265_211125, |             |                          |                    |            |               |                  |            |
| 0960_SS108_211125,                         | 0060_SS170_211125  |             |                          |                    |            |               |                  |            |
| EP231P: PFAS Sums                          |                    |             |                          |                    |            |               |                  |            |
| HDPE Soil Jar (EP231X)                     |                    | 25-Nov-2021 | 06-Dec-2021              | 24-May-2022        | ✓          | 07-Dec-2021   | 15-Jan-2022      | ✓          |
| 0960_SD199_211125,                         | 0960_SD219_211125, |             |                          |                    |            |               |                  |            |
| 0960_SS235_211125,                         | 0960_SS113_211125, |             |                          |                    |            |               |                  |            |
| 0960_SS231_211125,                         | 0960_SS265_211125, |             |                          |                    |            |               |                  |            |
| 0960_SS108_211125,                         | 0060_SS170_211125  |             |                          |                    |            |               |                  |            |



## Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

| Quality Control Sample Type                          |        | Count |         | Rate (%) |          |            | Quality Control Specification  |
|------------------------------------------------------|--------|-------|---------|----------|----------|------------|--------------------------------|
| Analytical Methods                                   | Method | QC    | Regular | Actual   | Expected | Evaluation |                                |
| Laboratory Duplicates (DUP)                          |        |       |         |          |          |            |                                |
| Moisture Content                                     | EA055  | 4     | 35      | 11.43    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Laboratory Control Samples (LCS)                     |        |       |         |          |          |            |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Method Blanks (MB)                                   |        |       |         |          |          |            |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Matrix Spikes (MS)                                   |        |       |         |          |          |            |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |



## Brief Method Summaries

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

| <i>Analytical Methods</i>                            | <i>Method</i> | <i>Matrix</i> | <i>Method Descriptions</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------------------------------|---------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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. |
| <i>Preparation Methods</i>                           | <i>Method</i> | <i>Matrix</i> | <i>Method Descriptions</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 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.                                                                                                                                                                                                                                   |



ALS Laboratory: EP Perth

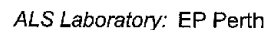
EMAIL INVOICES TO:

DATE TIME:

/ ES2019CARBSD0002

## Other comments:





RECEIVED BY:

DATE TIME:

EMAIL INVOICES TO:

/ ES2019CARBSD0002

## Other comments:

[illegible]

**CHAIN OF CUSTODY**

ALS) COC#: 30690

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: MG - DEF19009/Learmonth SED

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:

/ ES2019CARBSD0002

**LABORATORY USE ONLY (Circle)**

Custody Seal intact? Yes 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    | 0960_SS174_211125 | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 002    | 0960_SS243_211125 | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 003    | 0960_SS157_211125 | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 004    | 0960_SS166_211125 | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 005    | 0960_SS168_211125 | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 006    | 0960_SS279_211125 | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 007    | 0960_SS176_211125 | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 008    | 0960_SS189_211125 | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 009    | 0960_SS278_211125 | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 010    | 0960_SS125_211125 | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 011    | 0960_SS277_211125 | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 012    | 0960_SS124_211125 | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |

**CHAIN OF CUSTODY**

COC#: 30690

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: MG - DEF19009/Learmonth SED

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:

/ ES2019CARBSD0002

**LABORATORY USE ONLY (Circle)**

Custody Seal intact?

Yes 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    | 0960_SS174_211125 | HDPE Soil Jar | 200 mL | 00621019097717 | Grey | No       |        |
| 002    | 0960_SS243_211125 | HDPE Soil Jar | 200 mL | 00621019097673 | Grey | No       |        |
| 003    | 0960_SS157_211125 | HDPE Soil Jar | 200 mL | 00621019097745 | Grey | No       |        |
| 004    | 0960_SS166_211125 | HDPE Soil Jar | 200 mL | 00621019097734 | Grey | No       |        |
| 005    | 0960_SS168_211125 | HDPE Soil Jar | 200 mL | 00621019097766 | Grey | No       |        |
| 006    | 0960_SS279_211125 | HDPE Soil Jar | 200 mL | 00621019097654 | Grey | No       |        |
| 007    | 0960_SS176_211125 | HDPE Soil Jar | 200 mL | 00621019097750 | Grey | No       |        |
| 008    | 0960_SS189_211125 | HDPE Soil Jar | 200 mL | 00621019097683 | Grey | No       |        |
| 009    | 0960_SS278_211125 | HDPE Soil Jar | 200 mL | 00621019097756 | Grey | No       |        |
| 010    | 0960_SS125_211125 | HDPE Soil Jar | 200 mL | 00621019097760 | Grey | No       |        |
| 011    | 0960_SS277_211125 | HDPE Soil Jar | 200 mL | 00621019097698 | Grey | No       |        |
| 012    | 0960_SS124_211125 | HDPE Soil Jar | 200 mL | 00621019097661 | Grey | No       |        |

**Total Bottle Count: ALS: 12, Non ALS: 0**

## SAMPLE RECEIPT NOTIFICATION (SRN)

**Work Order : EP2114476**

|                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Client : <b>CARDNO (WA) PTY LTD</b></p> <p>Contact : [REDACTED]</p> <p>Address : 11 HARVEST TERRACE PO BOX 155<br/>WEST PERTH WA, AUSTRALIA 6006</p> <p>E-mail : [REDACTED]@cardno.com.au</p> <p>Telephone : ----</p> <p>Facsimile : ----</p> <p>Project : WA_0960_PFASOMP</p> <p>Order number : DEF19009/0960</p> <p>C-O-C number : 30690</p> <p>Site : DEF19009/Learmonth</p> <p>Sampler : [REDACTED]</p> | <p>Laboratory : Environmental Division Perth</p> <p>Contact : Customer Services EP</p> <p>Address : 26 Rigali Way Wangara WA Australia<br/>6065</p> <p>E-mail : ALSEnviro.Perth@alsglobal.com</p> <p>Telephone : +61-8-9406 1301</p> <p>Facsimile : +61-8-9406 1399</p> <p>Page : 1 of 2</p> <p>Quote number : ES2019CARBSD0002 (SY/139/19)</p> <p>QC Level : NEPM 2013 B3 &amp; ALS QC Standard</p> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Dates

|                                           |                                               |
|-------------------------------------------|-----------------------------------------------|
| Date Samples Received : 29-Nov-2021 11:30 | Issue Date : 29-Nov-2021                      |
| Client Requested Due Date : 08-Dec-2021   | Scheduled Reporting Date : <b>08-Dec-2021</b> |

### Delivery Details

|                            |                                              |
|----------------------------|----------------------------------------------|
| Mode of Delivery : Carrier | Security Seal : Not Available                |
| No. of coolers/boxes : 1   | Temperature : 21.1 - Ice present             |
| Receipt Detail :           | No. of samples received / analysed : 12 / 12 |

### General Comments

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



## Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exists.

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: SOIL

| Laboratory sample ID | Sampling date / time | Sample ID         | SOIL - EA055-103 Moisture Content | SOIL - EP231X (solids) PFAS - Full Suite (28 analytes) |
|----------------------|----------------------|-------------------|-----------------------------------|--------------------------------------------------------|
| EP2114476-001        | 25-Nov-2021 09:17    | 0960_SS174_211125 | ✓                                 | ✓                                                      |
| EP2114476-002        | 25-Nov-2021 09:21    | 0960_SS243_211125 | ✓                                 | ✓                                                      |
| EP2114476-003        | 25-Nov-2021 09:26    | 0960_SS157_211125 | ✓                                 | ✓                                                      |
| EP2114476-004        | 25-Nov-2021 09:28    | 0960_SS166_211125 | ✓                                 | ✓                                                      |
| EP2114476-005        | 25-Nov-2021 09:30    | 0960_SS168_211125 | ✓                                 | ✓                                                      |
| EP2114476-006        | 25-Nov-2021 09:32    | 0960_SS279_211125 | ✓                                 | ✓                                                      |
| EP2114476-007        | 25-Nov-2021 09:33    | 0960_SS176_211125 | ✓                                 | ✓                                                      |
| EP2114476-008        | 25-Nov-2021 10:34    | 0960_SS189_211125 | ✓                                 | ✓                                                      |
| EP2114476-009        | 25-Nov-2021 11:33    | 0960_SS278_211125 | ✓                                 | ✓                                                      |
| EP2114476-010        | 25-Nov-2021 12:10    | 0960_SS125_211125 | ✓                                 | ✓                                                      |
| EP2114476-011        | 25-Nov-2021 12:12    | 0960_SS277_211125 | ✓                                 | ✓                                                      |
| EP2114476-012        | 25-Nov-2021 12:14    | 0960_SS124_211125 | ✓                                 | ✓                                                      |

## Proactive Holding Time Report

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

## Requested Deliverables

|                                                                                                                  |       |                              |
|------------------------------------------------------------------------------------------------------------------|-------|------------------------------|
| <ul style="list-style-type: none"> <li>- A4 - AU Tax Invoice (INV)</li> </ul>                                    | Email | cardno.com.au                |
| <b>DERP LAB REPORTS</b>                                                                                          |       |                              |
| <ul style="list-style-type: none"> <li>- EDI Format - ESDAT (ESDAT)</li> </ul>                                   | Email | derp.labreports@esdat.com.au |
| <ul style="list-style-type: none"> <li>- *AU Certificate of Analysis - NATA (COA)</li> </ul>                     | Email | cardno.com.au                |
| <ul style="list-style-type: none"> <li>- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)</li> </ul>    | Email | cardno.com.au                |
| <ul style="list-style-type: none"> <li>- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)</li> </ul>            | Email | cardno.com.au                |
| <ul style="list-style-type: none"> <li>- A4 - AU Sample Receipt Notification - Environmental HT (SRN)</li> </ul> | Email | cardno.com.au                |
| <ul style="list-style-type: none"> <li>- Chain of Custody (CoC) (COC)</li> </ul>                                 | Email | cardno.com.au                |
| <ul style="list-style-type: none"> <li>- EDI Format - ESDAT (ESDAT)</li> </ul>                                   | Email | cardno.com.au                |
| <ul style="list-style-type: none"> <li>- EDI Format - XTab (XTAB)</li> </ul>                                     | Email | cardno.com.au                |
| <b>Perth</b>                                                                                                     |       |                              |
| <ul style="list-style-type: none"> <li>- A4 - AU Tax Invoice (INV)</li> </ul>                                    | Email | perth@cardno.com.au          |

## CERTIFICATE OF ANALYSIS

**Work Order** : **EP2114476**  
**Client** : **CARDNO (WA) PTY LTD**  
**Contact** : [REDACTED]  
**Address** : 11 HARVEST TERRACE PO BOX 155  
 WEST PERTH WA, AUSTRALIA 6006  
**Telephone** : ----  
**Project** : WA\_0960\_PFASOMP  
**Order number** : DEF19009/0960  
**C-O-C number** : 30690  
**Sampler** : [REDACTED]  
**Site** : DEF19009/Learmonth  
**Quote number** : SY/139/19  
**No. of samples received** : 12  
**No. of samples analysed** : 12

**Page** : 1 of 9  
**Laboratory** : Environmental Division Perth  
**Contact** : Customer Services EP  
**Address** : 26 Rigali Way Wangara WA Australia 6065  
**Telephone** : +61-8-9406 1301  
**Date Samples Received** : 29-Nov-2021 11:30  
**Date Analysis Commenced** : 06-Dec-2021  
**Issue Date** : 08-Dec-2021 16:53



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>      |
|------------------------------------------------------------------------|---------------------|------------------------------------|
| Edwandy Fadjjar                                                        | Organic Coordinator | Sydney Inorganics, Smithfield, NSW |
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator    | Sydney Inorganics, Smithfield, NSW |
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator    | Sydney Organics, Smithfield, NSW   |





## 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.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- 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

|                                                    |            |        |       | 0960_SS174_211125 | 0960_SS243_211125 | 0960_SS157_211125 | 0960_SS166_211125 | 0960_SS168_211125 |
|----------------------------------------------------|------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                               |            |        |       | 25-Nov-2021 09:17 | 25-Nov-2021 09:21 | 25-Nov-2021 09:26 | 25-Nov-2021 09:28 | 25-Nov-2021 09:30 |
| Compound                                           | CAS Number | LOR    | Unit  | EP2114476-001     | EP2114476-002     | EP2114476-003     | EP2114476-004     | EP2114476-005     |
|                                                    |            |        |       | Result            | Result            | Result            | Result            | Result            |
| <b>EA055: Moisture Content (Dried @ 105-110°C)</b> |            |        |       |                   |                   |                   |                   |                   |
| Moisture Content                                   | ----       | 0.1    | %     | 2.5               | 1.7               | 3.4               | 8.3               | 1.8               |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>       |            |        |       |                   |                   |                   |                   |                   |
| 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 | 0.245             | 0.0075            | 0.0011            | 0.0006            | 0.0004            |
| Perfluorodecane sulfonic acid (PFDS)               | 335-77-3   | 0.0002 | mg/kg | 0.0026            | <0.0002           | <0.0002           | <0.0002           | <0.0002           |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>     |            |        |       |                   |                   |                   |                   |                   |
| 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 | 0.0008            | <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 (PFTTrDA)                | 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           |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>         |            |        |       |                   |                   |                   |                   |                   |
| 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

|                                                           |                    |        |       | 0960_SS174_211125 | 0960_SS243_211125 | 0960_SS157_211125 | 0960_SS166_211125 | 0960_SS168_211125 |
|-----------------------------------------------------------|--------------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                      |                    |        |       | 25-Nov-2021 09:17 | 25-Nov-2021 09:21 | 25-Nov-2021 09:26 | 25-Nov-2021 09:28 | 25-Nov-2021 09:30 |
| Compound                                                  | CAS Number         | LOR    | Unit  | EP2114476-001     | EP2114476-002     | EP2114476-003     | EP2114476-004     | EP2114476-005     |
|                                                           |                    |        |       | Result            | Result            | Result            | Result            | Result            |
| <b>EP231C: Perfluoroalkyl Sulfonamides - Continued</b>    |                    |        |       |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>         |                    |        |       |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231P: PFAS Sums</b>                                  |                    |        |       |                   |                   |                   |                   |                   |
| Sum of PFAS                                               | ----               | 0.0002 | mg/kg | 0.249             | 0.0075            | 0.0011            | 0.0006            | 0.0004            |
| Sum of PFHxS and PFOS                                     | 355-46-4/1763-23-1 | 0.0002 | mg/kg | 0.245             | 0.0075            | 0.0011            | 0.0006            | 0.0004            |
| Sum of PFAS (WA DER List)                                 | ----               | 0.0002 | mg/kg | 0.245             | 0.0075            | 0.0011            | 0.0006            | 0.0004            |
| <b>EP231S: PFAS Surrogate</b>                             |                    |        |       |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                 | ----               | 0.0002 | %     | 105               | 107               | 95.0              | 112               | 102               |
| 13C8-PFOA                                                 | ----               | 0.0002 | %     | 117               | 99.5              | 112               | 95.5              | 105               |



## Analytical Results

Sub-Matrix: SEDIMENT  
 (Matrix: SOIL)

Sample ID

|                                                    |            |        |       | 0960_SS279_211125 | 0960_SS176_211125 | 0960_SS189_211125 | 0960_SS278_211125 | 0960_SS125_211125 |
|----------------------------------------------------|------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                               |            |        |       | 25-Nov-2021 09:32 | 25-Nov-2021 09:33 | 25-Nov-2021 10:34 | 25-Nov-2021 11:33 | 25-Nov-2021 12:10 |
| Compound                                           | CAS Number | LOR    | Unit  | EP2114476-006     | EP2114476-007     | EP2114476-008     | EP2114476-009     | EP2114476-010     |
|                                                    |            |        |       | Result            | Result            | Result            | Result            | Result            |
| <b>EA055: Moisture Content (Dried @ 105-110°C)</b> |            |        |       |                   |                   |                   |                   |                   |
| Moisture Content                                   | ----       | 0.1    | %     | 3.6               | 2.8               | 18.1              | 1.1               | 1.6               |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>       |            |        |       |                   |                   |                   |                   |                   |
| 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 | 0.0038            | 0.0036            | 0.0102            | 0.0030            | 0.0020            |
| Perfluorodecane sulfonic acid (PFDS)               | 335-77-3   | 0.0002 | mg/kg | <0.0002           | <0.0002           | 0.0003            | 0.0004            | <0.0002           |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>     |            |        |       |                   |                   |                   |                   |                   |
| 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 (PFTTrDA)                | 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           |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>         |            |        |       |                   |                   |                   |                   |                   |
| 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

|                                                           |                    |        |       | 0960_SS279_211125 | 0960_SS176_211125 | 0960_SS189_211125 | 0960_SS278_211125 | 0960_SS125_211125 |
|-----------------------------------------------------------|--------------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                      |                    |        |       | 25-Nov-2021 09:32 | 25-Nov-2021 09:33 | 25-Nov-2021 10:34 | 25-Nov-2021 11:33 | 25-Nov-2021 12:10 |
| Compound                                                  | CAS Number         | LOR    | Unit  | EP2114476-006     | EP2114476-007     | EP2114476-008     | EP2114476-009     | EP2114476-010     |
|                                                           |                    |        |       | Result            | Result            | Result            | Result            | Result            |
| <b>EP231C: Perfluoroalkyl Sulfonamides - Continued</b>    |                    |        |       |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>         |                    |        |       |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231P: PFAS Sums</b>                                  |                    |        |       |                   |                   |                   |                   |                   |
| Sum of PFAS                                               | ----               | 0.0002 | mg/kg | 0.0038            | 0.0036            | 0.0105            | 0.0034            | 0.0020            |
| Sum of PFHxS and PFOS                                     | 355-46-4/1763-23-1 | 0.0002 | mg/kg | 0.0038            | 0.0036            | 0.0102            | 0.0030            | 0.0020            |
| Sum of PFAS (WA DER List)                                 | ----               | 0.0002 | mg/kg | 0.0038            | 0.0036            | 0.0102            | 0.0030            | 0.0020            |
| <b>EP231S: PFAS Surrogate</b>                             |                    |        |       |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                 | ----               | 0.0002 | %     | 110               | 106               | 110               | 86.0              | 110               |
| 13C8-PFOA                                                 | ----               | 0.0002 | %     | 107               | 107               | 102               | 90.5              | 108               |



## Analytical Results

Sub-Matrix: SEDIMENT  
 (Matrix: SOIL)

Sample ID

|                                                    |            |        |       | 0960_SS277_211125 | 0960_SS124_211125 | ----  | ----  | ----  |
|----------------------------------------------------|------------|--------|-------|-------------------|-------------------|-------|-------|-------|
| Sampling date / time                               |            |        |       | 25-Nov-2021 12:12 | 25-Nov-2021 12:14 | ----  | ----  | ----  |
| Compound                                           | CAS Number | LOR    | Unit  | EP2114476-011     | EP2114476-012     | ----- | ----- | ----- |
|                                                    |            |        |       | Result            | Result            | ----  | ----  | ----  |
| <b>EA055: Moisture Content (Dried @ 105-110°C)</b> |            |        |       |                   |                   |       |       |       |
| Moisture Content                                   | ----       | 0.1    | %     | 2.0               | 3.5               | ----  | ----  | ----  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>       |            |        |       |                   |                   |       |       |       |
| 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 | 0.0703            | 0.241             | ----  | ----  | ----  |
| Perfluorodecane sulfonic acid (PFDS)               | 335-77-3   | 0.0002 | mg/kg | 0.0008            | 0.0118            | ----  | ----  | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>     |            |        |       |                   |                   |       |       |       |
| 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           | 0.0018            | ----  | ----  | ----  |
| Perfluorodecanoic acid (PFDA)                      | 335-76-2   | 0.0002 | mg/kg | 0.0003            | 0.0041            | ----  | ----  | ----  |
| Perfluoroundecanoic acid (PFUnDA)                  | 2058-94-8  | 0.0002 | mg/kg | <0.0002           | 0.0014            | ----  | ----  | ----  |
| Perfluorododecanoic acid (PFDoDA)                  | 307-55-1   | 0.0002 | mg/kg | <0.0002           | 0.0009            | ----  | ----  | ----  |
| 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           | ----  | ----  | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>         |            |        |       |                   |                   |       |       |       |
| 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<br>(Matrix: SOIL)                    |                    |        |       | Sample ID     | 0960_SS277_211125 | 0960_SS124_211125 | ----  | ----  | ----  |
|-----------------------------------------------------------|--------------------|--------|-------|---------------|-------------------|-------------------|-------|-------|-------|
| Sampling date / time                                      |                    |        |       |               | 25-Nov-2021 12:12 | 25-Nov-2021 12:14 | ----  | ----  | ----  |
| Compound                                                  | CAS Number         | LOR    | Unit  |               | EP2114476-011     | EP2114476-012     | ----- | ----- | ----- |
|                                                           |                    |        |       | Result        | Result            |                   | ----  | ----  | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides - Continued</b>    |                    |        |       |               |                   |                   |       |       |       |
| 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           |                   | ----  | ----  | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>         |                    |        |       |               |                   |                   |       |       |       |
| 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       | <b>0.0006</b>     |                   | ----  | ----  | ----  |
| 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | 120226-60-0        | 0.0005 | mg/kg | <0.0005       | <0.0005           |                   | ----  | ----  | ----  |
| <b>EP231P: PFAS Sums</b>                                  |                    |        |       |               |                   |                   |       |       |       |
| Sum of PFAS                                               | ----               | 0.0002 | mg/kg | <b>0.0714</b> | <b>0.262</b>      |                   | ----  | ----  | ----  |
| Sum of PFHxS and PFOS                                     | 355-46-4/1763-23-1 | 0.0002 | mg/kg | <b>0.0703</b> | <b>0.241</b>      |                   | ----  | ----  | ----  |
| Sum of PFAS (WA DER List)                                 | ----               | 0.0002 | mg/kg | <b>0.0703</b> | <b>0.242</b>      |                   | ----  | ----  | ----  |
| <b>EP231S: PFAS Surrogate</b>                             |                    |        |       |               |                   |                   |       |       |       |
| 13C4-PFOS                                                 | ----               | 0.0002 | %     | <b>89.0</b>   | <b>106</b>        |                   | ----  | ----  | ----  |
| 13C8-PFOA                                                 | ----               | 0.0002 | %     | <b>77.5</b>   | <b>110</b>        |                   | ----  | ----  | ----  |

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Work Order : EP2114476  
Client : CARDNO (WA) PTY LTD  
Project : WA\_0960\_PFASOMP



## Surrogate Control Limits

| Sub-Matrix: <b>SEDIMENT</b>   |            | Recovery Limits (%) |      |
|-------------------------------|------------|---------------------|------|
| Compound                      | CAS Number | Low                 | High |
| <b>EP231S: PFAS Surrogate</b> |            |                     |      |
| <b>13C4-PFOS</b>              | ----       | 60                  | 120  |
| <b>13C8-PFOA</b>              | ----       | 60                  | 120  |

## Inter-Laboratory Testing

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

(SOIL) EP231P: PFAS Sums

(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

## QUALITY CONTROL REPORT

|                                |                                                                          |                                |                                                  |
|--------------------------------|--------------------------------------------------------------------------|--------------------------------|--------------------------------------------------|
| <b>Work Order</b>              | <b>: EP2114476</b>                                                       | <b>Page</b>                    | <b>: 1 of 7</b>                                  |
| <b>Client</b>                  | <b>: CARDNO (WA) PTY LTD</b>                                             | <b>Laboratory</b>              | <b>: Environmental Division Perth</b>            |
| <b>Contact</b>                 | <b>: [REDACTED]</b>                                                      | <b>Contact</b>                 | <b>: Customer Services EP</b>                    |
| <b>Address</b>                 | <b>: 11 HARVEST TERRACE PO BOX 155<br/>WEST PERTH WA, AUSTRALIA 6006</b> | <b>Address</b>                 | <b>: 26 Rigali Way Wangara WA Australia 6065</b> |
| <b>Telephone</b>               | <b>: ----</b>                                                            | <b>Telephone</b>               | <b>: +61-8-9406 1301</b>                         |
| <b>Project</b>                 | <b>: WA_0960_PFASOMP</b>                                                 | <b>Date Samples Received</b>   | <b>: 29-Nov-2021</b>                             |
| <b>Order number</b>            | <b>: DEF19009/0960</b>                                                   | <b>Date Analysis Commenced</b> | <b>: 06-Dec-2021</b>                             |
| <b>C-O-C number</b>            | <b>: 30690</b>                                                           | <b>Issue Date</b>              | <b>: 08-Dec-2021</b>                             |
| <b>Sampler</b>                 | <b>: [REDACTED]</b>                                                      |                                |                                                  |
| <b>Site</b>                    | <b>: DEF19009/Learmonth</b>                                              |                                |                                                  |
| <b>Quote number</b>            | <b>: SY/139/19</b>                                                       |                                |                                                  |
| <b>No. of samples received</b> | <b>: 12</b>                                                              |                                |                                                  |
| <b>No. of samples analysed</b> | <b>: 12</b>                                                              |                                |                                                  |



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>      |
|--------------------|---------------------|------------------------------------|
| Edwandy Fadjar     | Organic Coordinator | Sydney Inorganics, Smithfield, NSW |
| [REDACTED]         | LCMS Coordinator    | Sydney Inorganics, Smithfield, NSW |
| [REDACTED]         | LCMS Coordinator    | Sydney Organics, Smithfield, NSW   |



## 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**

| 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: 4056872) |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2114476-002                                                 | 0960_SS243_211125 | EA055: Moisture Content                        | ----       | 0.1                               | %     | 1.7             | 1.5              | 11.6    | 0% - 50%           |
| ES2144168-001                                                 | Anonymous         | EA055: Moisture Content                        | ----       | 0.1                               | %     | 24.9            | 24.1             | 3.0     | 0% - 20%           |
| EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4056114)       |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2114475-001                                                 | 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 | 0.0003          | 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           |
| EP2114476-003                                                 | 0960_SS157_211125 | 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 | 0.0011          | 0.0013           | 12.1    | 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: 4056114)     |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2114475-001                                                 | 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: 4056114) - continued |                   |                                                                   |            |                                   |       |                 |                  |         |                    |
| EP2114475-001                                                         | 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           |
| EP2114476-003                                                         | 0960_SS157_211125 | 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: 4056114)                 |                   |                                                                   |            |                                   |       |                 |                  |         |                    |
| EP2114475-001                                                         | 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           |
| EP2114476-003                                                         | 0960_SS157_211125 | 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           |

Page : 4 of 7  
 Work Order : EP2114476  
 Client : CARDNO (WA) PTY LTD  
 Project : WA\_0960\_PFASOMP



| Sub-Matrix: <b>SOIL</b>                                             |                   |                                                     |             | Laboratory Duplicate (DUP) Report |       |                 |                  |         |                    |
|---------------------------------------------------------------------|-------------------|-----------------------------------------------------|-------------|-----------------------------------|-------|-----------------|------------------|---------|--------------------|
| Laboratory sample ID                                                | Sample ID         | Method: Compound                                    | CAS Number  | LOR                               | Unit  | Original Result | Duplicate Result | RPD (%) | Acceptable RPD (%) |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4056114)</b> |                   |                                                     |             |                                   |       |                 |                  |         |                    |
| EP2114475-001                                                       | 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           |
| EP2114476-003                                                       | 0960_SS157_211125 | 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           |





## 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**

| Sub-Matrix: SOIL                                                  |             |        |       | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |     |
|-------------------------------------------------------------------|-------------|--------|-------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|-----|
|                                                                   |             |        |       |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |     |
| Method: Compound                                                  | CAS Number  | LOR    | Unit  | Result                      |                                       |                           |                                   |     |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4056114)            |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: Perfluorobutane sulfonic acid (PFBS)                      | 375-73-5    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 92.4                      | 72.0                              | 128 |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)                    | 2706-91-4   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 92.0                      | 73.0                              | 123 |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)                     | 355-46-4    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 89.2                      | 67.0                              | 130 |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)                    | 375-92-8    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 88.4                      | 70.0                              | 132 |
| EP231X: Perfluorooctane sulfonic acid (PFOS)                      | 1763-23-1   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 91.6                      | 68.0                              | 136 |
| EP231X: Perfluorodecane sulfonic acid (PFDS)                      | 335-77-3    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 92.4                      | 59.0                              | 134 |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4056114)          |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: Perfluorobutanoic acid (PFBA)                             | 375-22-4    | 0.001  | mg/kg | <0.001                      | 0.00625 mg/kg                         | 97.8                      | 71.0                              | 135 |
| EP231X: Perfluoropentanoic acid (PFPeA)                           | 2706-90-3   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 99.6                      | 69.0                              | 132 |
| EP231X: Perfluorohexanoic acid (PFHxA)                            | 307-24-4    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 104                       | 70.0                              | 132 |
| EP231X: Perfluoroheptanoic acid (PFHpA)                           | 375-85-9    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 104                       | 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                         | 98.4                      | 72.0                              | 129 |
| EP231X: Perfluorodecanoic acid (PFDA)                             | 335-76-2    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 97.2                      | 69.0                              | 133 |
| EP231X: Perfluoroundecanoic acid (PFUnDA)                         | 2058-94-8   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 87.2                      | 64.0                              | 136 |
| EP231X: Perfluorododecanoic acid (PFDoDA)                         | 307-55-1    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 103                       | 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                         | 111                       | 69.0                              | 133 |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4056114)              |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 111                       | 67.0                              | 137 |
| EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 113                       | 71.6                              | 129 |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 92.3                      | 69.8                              | 131 |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 114                       | 68.7                              | 130 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 107                       | 65.1                              | 134 |
| EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 96.4                      | 63.0                              | 144 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 90.8                      | 61.0                              | 139 |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4056114)       |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.0005 | mg/kg | <0.0005                     | 0.00125 mg/kg                         | 112                       | 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                         | 112                       | 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                         | 102                       | 65.0                              | 137 |



| Sub-Matrix: SOIL                                                        |             |        |       | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                    |                       |      |
|-------------------------------------------------------------------------|-------------|--------|-------|-----------------------------|---------------------------------------|--------------------|-----------------------|------|
| Method: Compound                                                        | CAS Number  | LOR    | Unit  |                             | Spike                                 | Spike Recovery (%) | Acceptable Limits (%) |      |
|                                                                         |             |        |       |                             | Concentration                         | LCS                | Low                   | High |
|                                                                         |             |        |       |                             |                                       |                    |                       |      |
|                                                                         |             |        |       |                             |                                       |                    |                       |      |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4056114) - continued |             |        |       |                             |                                       |                    |                       |      |
| EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)                     | 120226-60-0 | 0.0005 | mg/kg | <0.0005                     | 0.00125 mg/kg                         | 85.2               | 69.2                  | 143  |

## 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                                         |           |                                                                   |            | 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: 4056114)   |           |                                                                   |            |                          |                  |                       |      |
| EP2114475-001                                            | Anonymous | EP231X: Perfluorobutane sulfonic acid (PFBS)                      | 375-73-5   | 0.00125 mg/kg            | 92.8             | 72.0                  | 128  |
|                                                          |           | EP231X: Perfluoropentane sulfonic acid (PFPeS)                    | 2706-91-4  | 0.00125 mg/kg            | 98.0             | 73.0                  | 123  |
|                                                          |           | EP231X: Perfluorohexane sulfonic acid (PFHxS)                     | 355-46-4   | 0.00125 mg/kg            | 104              | 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            | 88.4             | 68.0                  | 136  |
|                                                          |           | EP231X: Perfluorodecane sulfonic acid (PFDS)                      | 335-77-3   | 0.00125 mg/kg            | 101              | 59.0                  | 134  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4056114) |           |                                                                   |            |                          |                  |                       |      |
| EP2114475-001                                            | Anonymous | EP231X: Perfluorobutanoic acid (PFBA)                             | 375-22-4   | 0.00625 mg/kg            | 77.8             | 71.0                  | 135  |
|                                                          |           | EP231X: Perfluoropentanoic acid (PFPeA)                           | 2706-90-3  | 0.00125 mg/kg            | 105              | 69.0                  | 132  |
|                                                          |           | EP231X: Perfluorohexanoic acid (PFHxA)                            | 307-24-4   | 0.00125 mg/kg            | 112              | 70.0                  | 132  |
|                                                          |           | EP231X: Perfluoroheptanoic acid (PFHpA)                           | 375-85-9   | 0.00125 mg/kg            | 116              | 71.0                  | 131  |
|                                                          |           | EP231X: Perfluorooctanoic acid (PFOA)                             | 335-67-1   | 0.00125 mg/kg            | 106              | 69.0                  | 133  |
|                                                          |           | EP231X: Perfluorononanoic acid (PFNA)                             | 375-95-1   | 0.00125 mg/kg            | 97.6             | 72.0                  | 129  |
|                                                          |           | EP231X: Perfluorodecanoic acid (PFDA)                             | 335-76-2   | 0.00125 mg/kg            | 94.8             | 69.0                  | 133  |
|                                                          |           | EP231X: Perfluoroundecanoic acid (PFUnDA)                         | 2058-94-8  | 0.00125 mg/kg            | 84.8             | 64.0                  | 136  |
|                                                          |           | EP231X: Perfluorododecanoic acid (PFDoDA)                         | 307-55-1   | 0.00125 mg/kg            | 105              | 69.0                  | 135  |
|                                                          |           | EP231X: Perfluorotridecanoic acid (PFTTrDA)                       | 72629-94-8 | 0.00125 mg/kg            | 108              | 66.0                  | 139  |
|                                                          |           | EP231X: Perfluorotetradecanoic acid (PFTeDA)                      | 376-06-7   | 0.00312 mg/kg            | 114              | 69.0                  | 133  |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4056114)     |           |                                                                   |            |                          |                  |                       |      |
| EP2114475-001                                            | Anonymous | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6   | 0.00125 mg/kg            | 114              | 67.0                  | 137  |
|                                                          |           | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8 | 0.00312 mg/kg            | 112              | 71.6                  | 129  |
|                                                          |           | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2  | 0.00312 mg/kg            | 97.4             | 69.8                  | 131  |
|                                                          |           | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7 | 0.00312 mg/kg            | 109              | 68.7                  | 130  |
|                                                          |           | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2  | 0.00312 mg/kg            | 113              | 65.1                  | 134  |
|                                                          |           | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9  | 0.00125 mg/kg            | 101              | 63.0                  | 144  |



Sub-Matrix: SOIL

| 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: 4056114) - continued |           |                                                                  |             |                          |                  |                       |      |
| EP2114475-001                                                    | Anonymous | 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: 4056114)      |           |                                                                  |             |                          |                  |                       |      |
| EP2114475-001                                                    | Anonymous | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                | 757124-72-4 | 0.00125 mg/kg            | 113              | 62.0                  | 145  |
|                                                                  |           | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                | 27619-97-2  | 0.00125 mg/kg            | 118              | 64.0                  | 140  |
|                                                                  |           | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                | 39108-34-4  | 0.00125 mg/kg            | 108              | 65.0                  | 137  |
|                                                                  |           | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)              | 120226-60-0 | 0.00125 mg/kg            | # 48.8           | 69.2                  | 143  |

## QA/QC Compliance Assessment to assist with Quality Review

Work Order : EP2114476

Page : 1 of 5

Client : CARDNO (WA) PTY LTD

Contact : [REDACTED]

Project : WA\_0960\_PFASOMP

Site : DEF19009/Learmonth

Sampler : [REDACTED]

Order number : DEF19009/0960

Laboratory : Environmental Division Perth

Telephone : +61-8-9406 1301

Date Samples Received : 29-Nov-2021

Issue Date : 08-Dec-2021

No. of samples received : 12

No. of samples analysed : 12

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

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

### Summary of Outliers

#### Outliers : Quality Control Samples

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

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- 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.

*Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes*

| Compound Group Name                        | Laboratory Sample ID | Client Sample ID | Analyte                                            | CAS Number  | Data   | Limits    | Comment                                                |
|--------------------------------------------|----------------------|------------------|----------------------------------------------------|-------------|--------|-----------|--------------------------------------------------------|
| <b>Matrix Spike (MS) Recoveries</b>        |                      |                  |                                                    |             |        |           |                                                        |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids | EP2114475--001       | Anonymous        | <b>10:2 Fluorotelomer sulfonic acid (10:2 FTS)</b> | 120226-60-0 | 48.8 % | 69.2-143% | <b>Recovery less than lower data quality objective</b> |

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.

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time

| Method                                                                                                                                                     | Sample Date                                                                                                                     | Extraction / Preparation |                    |             | Analysis      |                  |             |   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------|-------------|---------------|------------------|-------------|---|
| Container / Client Sample ID(s)                                                                                                                            |                                                                                                                                 | Date extracted           | Due for extraction | Evaluation  | Date analysed | Due for analysis | Evaluation  |   |
| EA055: Moisture Content (Dried @ 105-110°C)                                                                                                                |                                                                                                                                 |                          |                    |             |               |                  |             |   |
| HDPE Soil Jar (EA055)<br>0960_SS174_211125,<br>0960_SS157_211125,<br>0960_SS168_211125,<br>0960_SS176_211125,<br>0960_SS278_211125,<br>0960_SS277_211125,  | 0960_SS243_211125,<br>0960_SS166_211125,<br>0960_SS279_211125,<br>0960_SS189_211125,<br>0960_SS125_211125,<br>0960_SS124_211125 | 25-Nov-2021              | ----               | ----        | ----          | 06-Dec-2021      | 09-Dec-2021 | ✓ |
| EP231A: Perfluoroalkyl Sulfonic Acids                                                                                                                      |                                                                                                                                 |                          |                    |             |               |                  |             |   |
| HDPE Soil Jar (EP231X)<br>0960_SS174_211125,<br>0960_SS157_211125,<br>0960_SS168_211125,<br>0960_SS176_211125,<br>0960_SS278_211125,<br>0960_SS277_211125, | 0960_SS243_211125,<br>0960_SS166_211125,<br>0960_SS279_211125,<br>0960_SS189_211125,<br>0960_SS125_211125,<br>0960_SS124_211125 | 25-Nov-2021              | 06-Dec-2021        | 24-May-2022 | ✓             | 07-Dec-2021      | 15-Jan-2022 | ✓ |
| EP231B: Perfluoroalkyl Carboxylic Acids                                                                                                                    |                                                                                                                                 |                          |                    |             |               |                  |             |   |
| HDPE Soil Jar (EP231X)<br>0960_SS174_211125,<br>0960_SS157_211125,<br>0960_SS168_211125,<br>0960_SS176_211125,<br>0960_SS278_211125,<br>0960_SS277_211125, | 0960_SS243_211125,<br>0960_SS166_211125,<br>0960_SS279_211125,<br>0960_SS189_211125,<br>0960_SS125_211125,<br>0960_SS124_211125 | 25-Nov-2021              | 06-Dec-2021        | 24-May-2022 | ✓             | 07-Dec-2021      | 15-Jan-2022 | ✓ |

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 Work Order : EP2114476  
 Client : CARDNO (WA) PTY LTD  
 Project : WA\_0960\_PFASOMP



Matrix: **SOIL**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

| Method                                     |                    | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |
|--------------------------------------------|--------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|
| Container / Client Sample ID(s)            |                    |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| EP231C: Perfluoroalkyl Sulfonamides        |                    |             |                          |                    |            |               |                  |            |
| HDPE Soil Jar (EP231X)                     |                    |             |                          |                    |            |               |                  |            |
| 0960_SS174_211125,                         | 0960_SS243_211125, | 25-Nov-2021 | 06-Dec-2021              | 24-May-2022        | ✓          | 07-Dec-2021   | 15-Jan-2022      | ✓          |
| 0960_SS157_211125,                         | 0960_SS166_211125, |             |                          |                    |            |               |                  |            |
| 0960_SS168_211125,                         | 0960_SS279_211125, |             |                          |                    |            |               |                  |            |
| 0960_SS176_211125,                         | 0960_SS189_211125, |             |                          |                    |            |               |                  |            |
| 0960_SS278_211125,                         | 0960_SS125_211125, |             |                          |                    |            |               |                  |            |
| 0960_SS277_211125,                         | 0960_SS124_211125  |             |                          |                    |            |               |                  |            |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids |                    |             |                          |                    |            |               |                  |            |
| HDPE Soil Jar (EP231X)                     |                    |             |                          |                    |            |               |                  |            |
| 0960_SS174_211125,                         | 0960_SS243_211125, | 25-Nov-2021 | 06-Dec-2021              | 24-May-2022        | ✓          | 07-Dec-2021   | 15-Jan-2022      | ✓          |
| 0960_SS157_211125,                         | 0960_SS166_211125, |             |                          |                    |            |               |                  |            |
| 0960_SS168_211125,                         | 0960_SS279_211125, |             |                          |                    |            |               |                  |            |
| 0960_SS176_211125,                         | 0960_SS189_211125, |             |                          |                    |            |               |                  |            |
| 0960_SS278_211125,                         | 0960_SS125_211125, |             |                          |                    |            |               |                  |            |
| 0960_SS277_211125,                         | 0960_SS124_211125  |             |                          |                    |            |               |                  |            |
| EP231P: PFAS Sums                          |                    |             |                          |                    |            |               |                  |            |
| HDPE Soil Jar (EP231X)                     |                    |             |                          |                    |            |               |                  |            |
| 0960_SS174_211125,                         | 0960_SS243_211125, | 25-Nov-2021 | 06-Dec-2021              | 24-May-2022        | ✓          | 07-Dec-2021   | 15-Jan-2022      | ✓          |
| 0960_SS157_211125,                         | 0960_SS166_211125, |             |                          |                    |            |               |                  |            |
| 0960_SS168_211125,                         | 0960_SS279_211125, |             |                          |                    |            |               |                  |            |
| 0960_SS176_211125,                         | 0960_SS189_211125, |             |                          |                    |            |               |                  |            |
| 0960_SS278_211125,                         | 0960_SS125_211125, |             |                          |                    |            |               |                  |            |
| 0960_SS277_211125,                         | 0960_SS124_211125  |             |                          |                    |            |               |                  |            |





## Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

| Quality Control Sample Type                          |        | Count |         | Rate (%) |          |            | Quality Control Specification  |
|------------------------------------------------------|--------|-------|---------|----------|----------|------------|--------------------------------|
| Analytical Methods                                   | Method | QC    | Regular | Actual   | Expected | Evaluation |                                |
|                                                      |        |       |         |          |          |            |                                |
| Laboratory Duplicates (DUP)                          |        |       |         |          |          |            |                                |
| Moisture Content                                     | EA055  | 2     | 15      | 13.33    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Laboratory Control Samples (LCS)                     |        |       |         |          |          |            |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Method Blanks (MB)                                   |        |       |         |          |          |            |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Matrix Spikes (MS)                                   |        |       |         |          |          |            |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |



## Brief Method Summaries

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

| Analytical Methods                                   | Method | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------------------------------------------|--------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Moisture Content                                     | EA055  | SOIL   | In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | SOIL   | In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements. |
| Preparation Methods                                  | Method | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| QuEChERS Extraction of Solids                        | ORG71  | SOIL   | In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.                                                                                                                                                                                                                                   |

**CHAIN OF CUSTODY**

COC#: 30695

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: MG - DEF19009/Learmonth GW

ORDER NO: DEF19009/0960

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

CONTACT PH:

QUOTE NO: SY/139/19

SAMPLER MOBILE:

/ ES2019CARBSD0002

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 | Ground Waters Primary WATER | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|-------------------|-------------|------------------------|--------|----------------------|---------|-----------------------------|----------------------|------------------------|
| 001    | 0960_MW170_211125 |             | 25/11/2021<br>09:36 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial<br>4/8              |                      |                        |
| 002    | 0960_MW172_211125 |             | 25/11/2021<br>09:42 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial<br>4/8              |                      |                        |
| 003    | 0960_MW159_211125 |             | 25/11/2021<br>10:17 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial<br>4/8              |                      |                        |
| 004    | 0960_MW134_211125 |             | 25/11/2021<br>10:53 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial<br>4/8              |                      |                        |
| 005    | 0960_MW115_211125 |             | 25/11/2021<br>11:47 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial<br>4/8              |                      |                        |

**CHAIN OF CUSTODY**

COC#: 30695

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: MG - DEF19009/Learmonth GW

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:

/ ES2019CARBSD0002

**LABORATORY USE ONLY (Circle)**

Custody Seal intact? Yes 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    | 0960_MW170_211125 | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 002    | 0960_MW172_211125 | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 003    | 0960_MW159_211125 | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 004    | 0960_MW134_211125 | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 005    | 0960_MW115_211125 | Ground Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |

**CHAIN OF CUSTODY**

COC#: 30695

ALS Laboratory: EP Perth

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: MG - DEF19009/Learmonth GW

ORDER NO: DEF19009/0960

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

SAMPLER MOBILE:

/ ES2019CARBSD0002

**LABORATORY USE ONLY (Circle)**

Custody Seal intact?

Yes 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    | 0960_MW170_211125 | HDPE (no PTFE)                 | 20 mL  | 00352101071393 | Grey  | No       |        |
| 001    | 0960_MW170_211125 | HDPE (no PTFE)                 | 20 mL  | 00352101071159 | Grey  | No       |        |
| 001    | 0960_MW170_211125 | Clear Plastic Bottle - Natural | 250 mL | 00070621197239 | Green | No       |        |
| 002    | 0960_MW172_211125 | Clear Plastic Bottle - Natural | 250 mL | 00070621197347 | Green | No       |        |
| 002    | 0960_MW172_211125 | HDPE (no PTFE)                 | 20 mL  | 00352101071034 | Grey  | No       |        |
| 002    | 0960_MW172_211125 | HDPE (no PTFE)                 | 20 mL  | 00352101071210 | Grey  | No       |        |
| 003    | 0960_MW159_211125 | HDPE (no PTFE)                 | 20 mL  | 00352101071657 | Grey  | No       |        |
| 003    | 0960_MW159_211125 | HDPE (no PTFE)                 | 20 mL  | 00352101071722 | Grey  | No       |        |
| 003    | 0960_MW159_211125 | Clear Plastic Bottle - Natural | 250 mL | 00070621197288 | Green | No       |        |
| 004    | 0960_MW134_211125 | Clear Plastic Bottle - Natural | 250 mL | 00070621190011 | Green | No       |        |
| 004    | 0960_MW134_211125 | HDPE (no PTFE)                 | 20 mL  | 00352101071364 | Grey  | No       |        |
| 004    | 0960_MW134_211125 | HDPE (no PTFE)                 | 20 mL  | 00352101071107 | Grey  | No       |        |
| 005    | 0960_MW115_211125 | Clear Plastic Bottle - Natural | 250 mL | 00070621191121 | Green | No       |        |
| 005    | 0960_MW115_211125 | HDPE (no PTFE)                 | 20 mL  | 00352101071646 | Grey  | No       |        |
| 005    | 0960_MW115_211125 | HDPE (no PTFE)                 | 20 mL  | 00352101070829 | Grey  | No       |        |

**Total Bottle Count: ALS: 15, Non ALS: 0**

## SAMPLE RECEIPT NOTIFICATION (SRN)

**Work Order : EP2114477**

|                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Client : <b>CARDNO (WA) PTY LTD</b></p> <p>Contact : [REDACTED]</p> <p>Address : 11 HARVEST TERRACE PO BOX 155<br/>WEST PERTH WA, AUSTRALIA 6006</p> <p>E-mail : [REDACTED]@cardno.com.au</p> <p>Telephone : ----</p> <p>Facsimile : ----</p> <p>Project : WA_0960_PFASOMP</p> <p>Order number : DEF19009/0960</p> <p>C-O-C number : 30695</p> <p>Site : DEF19009/Learmonth</p> <p>Sampler : [REDACTED]</p> | <p>Laboratory : Environmental Division Perth</p> <p>Contact : Customer Services EP</p> <p>Address : 26 Rigali Way Wangara WA Australia<br/>6065</p> <p>E-mail : ALSEnviro.Perth@alsglobal.com</p> <p>Telephone : +61-8-9406 1301</p> <p>Facsimile : +61-8-9406 1399</p> <p>Page : 1 of 2</p> <p>Quote number : ES2019CARBSD0002 (SY/139/19)</p> <p>QC Level : NEPM 2013 B3 &amp; ALS QC Standard</p> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Dates

|                                           |                                               |
|-------------------------------------------|-----------------------------------------------|
| Date Samples Received : 29-Nov-2021 11:30 | Issue Date : 29-Nov-2021                      |
| Client Requested Due Date : 08-Dec-2021   | Scheduled Reporting Date : <b>08-Dec-2021</b> |

### Delivery Details

|                             |                                            |
|-----------------------------|--------------------------------------------|
| Mode of Delivery : Carrier  | Security Seal : Not Available              |
| No. of coolers/boxes : 2    | Temperature : 23.1 - Ice present           |
| Receipt Detail : Ice Melted | 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
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepancies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **PFAS analysis will be conducted by ALS Environmental, Sydney, NATA accreditation no. 825, Site No. 10911.**
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.





## Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exists.

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

| Laboratory sample ID | Sampling date / time | Sample ID         | WATER - EN055 - PG<br>Ionic Balance by ED037P, ED041G, ED045G &<br>WATER - EP231X<br>PFAS - Full Suite (28 analytes) | WATER - NT-01<br>Major Cations (Ca, Mg, Na, K) | WATER - NT-02<br>Major Anions (Chloride, Sulphate, Alkalinity) |
|----------------------|----------------------|-------------------|----------------------------------------------------------------------------------------------------------------------|------------------------------------------------|----------------------------------------------------------------|
| EP2114477-001        | 25-Nov-2021 09:36    | 0960_MW170_211125 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114477-002        | 25-Nov-2021 09:42    | 0960_MW172_211125 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114477-003        | 25-Nov-2021 10:17    | 0960_MW159_211125 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114477-004        | 25-Nov-2021 10:53    | 0960_MW134_211125 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2114477-005        | 25-Nov-2021 11:47    | 0960_MW115_211125 | ✓                                                                                                                    | ✓                                              | ✓                                                              |

## Proactive Holding Time Report

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

## Requested Deliverables

|                                                                                                                                                                                                                                                                                                                                                                                                                          |       |                              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------------------------------|
| <ul style="list-style-type: none"> <li>- A4 - AU Tax Invoice (INV)</li> </ul>                                                                                                                                                                                                                                                                                                                                            | Email | cardno.com.au                |
| <b>DERP LAB REPORTS</b> <ul style="list-style-type: none"> <li>- EDI Format - ESDAT (ESDAT)</li> </ul>                                                                                                                                                                                                                                                                                                                   | Email | derp.labreports@esdat.com.au |
| <ul style="list-style-type: none"> <li>- *AU Certificate of Analysis - NATA (COA)</li> <li>- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)</li> <li>- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)</li> <li>- A4 - AU Sample Receipt Notification - Environmental HT (SRN)</li> <li>- Chain of Custody (CoC) (COC)</li> <li>- EDI Format - ESDAT (ESDAT)</li> <li>- EDI Format - XTab (XTAB)</li> </ul> | Email | cardno.com.au                |
| <b>Perth</b> <ul style="list-style-type: none"> <li>- A4 - AU Tax Invoice (INV)</li> </ul>                                                                                                                                                                                                                                                                                                                               | Email | perth@cardno.com.au          |

## CERTIFICATE OF ANALYSIS

**Work Order** : EP2114477  
**Client** : CARDNO (WA) PTY LTD  
**Contact** : [REDACTED]  
**Address** : 11 HARVEST TERRACE PO BOX 155  
 WEST PERTH WA, AUSTRALIA 6006  
**Telephone** : ----  
**Project** : WA\_0960\_PFASOMP  
**Order number** : DEF19009/0960  
**C-O-C number** : 30695  
**Sampler** : [REDACTED]  
**Site** : DEF19009/Learmonth  
**Quote number** : SY/139/19  
**No. of samples received** : 5  
**No. of samples analysed** : 5

**Page** : 1 of 6  
**Laboratory** : Environmental Division Perth  
**Contact** : Customer Services EP  
**Address** : 26 Rigali Way Wangara WA Australia 6065  
**Telephone** : +61-8-9406 1301  
**Date Samples Received** : 29-Nov-2021 11:30  
**Date Analysis Commenced** : 01-Dec-2021  
**Issue Date** : 08-Dec-2021 12:38



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>    |
|------------------------------------------------------------------------|----------------------------|----------------------------------|
| <span style="background-color: black; color: black;">[REDACTED]</span> | Laboratory Manager (Perth) | Perth Inorganics, Wangara, WA    |
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator           | Sydney Organics, Smithfield, NSW |



## 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.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- 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.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, 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: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                        |             |      |       | 0960_MW170_211125 | 0960_MW172_211125 | 0960_MW159_211125 | 0960_MW134_211125 | 0960_MW115_211125 |
|--------------------------------------------------------|-------------|------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                   |             |      |       | 25-Nov-2021 09:36 | 25-Nov-2021 09:42 | 25-Nov-2021 10:17 | 25-Nov-2021 10:53 | 25-Nov-2021 11:47 |
| Compound                                               | CAS Number  | LOR  | Unit  | EP2114477-001     | EP2114477-002     | EP2114477-003     | EP2114477-004     | EP2114477-005     |
|                                                        |             |      |       | Result            | Result            | Result            | Result            | Result            |
| <b>ED037P: Alkalinity by PC Titrator</b>               |             |      |       |                   |                   |                   |                   |                   |
| Hydroxide Alkalinity as CaCO3                          | DMO-210-001 | 1    | mg/L  | <1                | <1                | <1                | <1                | <1                |
| Carbonate Alkalinity as CaCO3                          | 3812-32-6   | 1    | mg/L  | <1                | <1                | <1                | <1                | <1                |
| Bicarbonate Alkalinity as CaCO3                        | 71-52-3     | 1    | mg/L  | 208               | 287               | 482               | 182               | 339               |
| Total Alkalinity as CaCO3                              | ----        | 1    | mg/L  | 208               | 287               | 482               | 182               | 339               |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b> |             |      |       |                   |                   |                   |                   |                   |
| Sulfate as SO4 - Turbidimetric                         | 14808-79-8  | 1    | mg/L  | 1510              | 2610              | 1180              | 3310              | 1520              |
| <b>ED045G: Chloride by Discrete Analyser</b>           |             |      |       |                   |                   |                   |                   |                   |
| Chloride                                               | 16887-00-6  | 1    | mg/L  | 15000             | 12000             | 9910              | 21200             | 11900             |
| <b>ED093F: Dissolved Major Cations</b>                 |             |      |       |                   |                   |                   |                   |                   |
| Calcium                                                | 7440-70-2   | 1    | mg/L  | 684               | 468               | 416               | 572               | 544               |
| Magnesium                                              | 7439-95-4   | 1    | mg/L  | 891               | 646               | 607               | 1430              | 780               |
| Sodium                                                 | 7440-23-5   | 1    | mg/L  | 8000              | 7180              | 5220              | 12900             | 6390              |
| Potassium                                              | 7440-09-7   | 1    | mg/L  | 173               | 206               | 233               | 679               | 255               |
| <b>EN055: Ionic Balance</b>                            |             |      |       |                   |                   |                   |                   |                   |
| ∅ Total Anions                                         | ----        | 0.01 | meq/L | 459               | 398               | 314               | 670               | 374               |
| ∅ Total Cations                                        | ----        | 0.01 | meq/L | 460               | 394               | 304               | 725               | 376               |
| ∅ Ionic Balance                                        | ----        | 0.01 | %     | 0.12              | 0.56              | 1.62              | 3.88              | 0.23              |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>           |             |      |       |                   |                   |                   |                   |                   |
| Perfluorobutane sulfonic acid (PFBS)                   | 375-73-5    | 0.02 | µg/L  | 0.07              | 0.81              | <0.02             | <0.02             | 0.19              |
| Perfluoropentane sulfonic acid (PFPeS)                 | 2706-91-4   | 0.02 | µg/L  | 0.07              | 0.94              | <0.02             | <0.02             | 0.20              |
| Perfluorohexane sulfonic acid (PFHxS)                  | 355-46-4    | 0.01 | µg/L  | 0.52              | 6.21              | <0.01             | <0.01             | 1.40              |
| Perfluoroheptane sulfonic acid (PFHpS)                 | 375-92-8    | 0.02 | µg/L  | <0.02             | 0.18              | <0.02             | <0.02             | 0.03              |
| Perfluorooctane sulfonic acid (PFOS)                   | 1763-23-1   | 0.01 | µg/L  | <0.01             | 1.39              | <0.01             | <0.01             | 0.29              |
| Perfluorodecane sulfonic acid (PFDS)                   | 335-77-3    | 0.02 | µg/L  | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>         |             |      |       |                   |                   |                   |                   |                   |
| 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              | 0.65              | <0.02             | <0.02             | 0.06              |
| Perfluorohexanoic acid (PFHxA)                         | 307-24-4    | 0.02 | µg/L  | 0.06              | 2.49              | <0.02             | <0.02             | 0.39              |
| Perfluoroheptanoic acid (PFHpA)                        | 375-85-9    | 0.02 | µg/L  | <0.02             | 0.35              | <0.02             | <0.02             | 0.02              |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_MW170_211125 | 0960_MW172_211125 | 0960_MW159_211125 | 0960_MW134_211125 | 0960_MW115_211125 |
|------------------------------------------------------------|-------------|------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                       |             |      |      | 25-Nov-2021 09:36 | 25-Nov-2021 09:42 | 25-Nov-2021 10:17 | 25-Nov-2021 10:53 | 25-Nov-2021 11:47 |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2114477-001     | EP2114477-002     | EP2114477-003     | EP2114477-004     | EP2114477-005     |
|                                                            |             |      |      | Result            | Result            | Result            | Result            | Result            |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                   |                   |                   |                   |                   |
| Perfluorooctanoic acid (PFOA)                              | 335-67-1    | 0.01 | µg/L | <0.01             | <b>0.36</b>       | <0.01             | <0.01             | <b>0.03</b>       |
| 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             |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                   |                   |                   |                   |                   |
| Perfluorooctane sulfonamide (FOSA)                         | 754-91-6    | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)              | 31506-32-8  | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)               | 4151-50-2   | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)       | 24448-09-7  | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)        | 1691-99-2   | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)  | 2355-31-9   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)   | 2991-50-6   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                   |                   |                   |                   |                   |
| 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             |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_MW170_211125 | 0960_MW172_211125 | 0960_MW159_211125 | 0960_MW134_211125 | 0960_MW115_211125 |
|---------------------------------------------------------------|--------------------|------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                          |                    |      |      | 25-Nov-2021 09:36 | 25-Nov-2021 09:42 | 25-Nov-2021 10:17 | 25-Nov-2021 10:53 | 25-Nov-2021 11:47 |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2114477-001     | EP2114477-002     | EP2114477-003     | EP2114477-004     | EP2114477-005     |
|                                                               |                    |      |      | Result            | Result            | Result            | Result            | Result            |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                   |                   |                   |                   |                   |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                   |                   |                   |                   |                   |
| Sum of PFAS                                                   | ----               | 0.01 | µg/L | 0.74              | 13.6              | <0.01             | <0.01             | 2.61              |
| Sum of PFHxS and PFOS                                         | 355-46-4/1763-23-1 | 0.01 | µg/L | 0.52              | 7.60              | <0.01             | <0.01             | 1.69              |
| Sum of PFAS (WA DER List)                                     | ----               | 0.01 | µg/L | 0.67              | 12.5              | <0.01             | <0.01             | 2.38              |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 104               | 110               | 103               | 105               | 113               |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 103               | 114               | 102               | 108               | 106               |



Page : 6 of 6  
Work Order : EP2114477  
Client : CARDNO (WA) PTY LTD  
Project : WA\_0960\_PFASOMP



## Surrogate Control Limits

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

## Inter-Laboratory Testing

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

## QUALITY CONTROL REPORT

|                                |                                                                          |                                |                                                  |
|--------------------------------|--------------------------------------------------------------------------|--------------------------------|--------------------------------------------------|
| <b>Work Order</b>              | <b>: EP2114477</b>                                                       | <b>Page</b>                    | <b>: 1 of 9</b>                                  |
| <b>Client</b>                  | <b>: CARDNO (WA) PTY LTD</b>                                             | <b>Laboratory</b>              | <b>: Environmental Division Perth</b>            |
| <b>Contact</b>                 | <b>: [REDACTED]</b>                                                      | <b>Contact</b>                 | <b>: Customer Services EP</b>                    |
| <b>Address</b>                 | <b>: 11 HARVEST TERRACE PO BOX 155<br/>WEST PERTH WA, AUSTRALIA 6006</b> | <b>Address</b>                 | <b>: 26 Rigali Way Wangara WA Australia 6065</b> |
| <b>Telephone</b>               | <b>: ----</b>                                                            | <b>Telephone</b>               | <b>: +61-8-9406 1301</b>                         |
| <b>Project</b>                 | <b>: WA_0960_PFASOMP</b>                                                 | <b>Date Samples Received</b>   | <b>: 29-Nov-2021</b>                             |
| <b>Order number</b>            | <b>: DEF19009/0960</b>                                                   | <b>Date Analysis Commenced</b> | <b>: 01-Dec-2021</b>                             |
| <b>C-O-C number</b>            | <b>: 30695</b>                                                           | <b>Issue Date</b>              | <b>: 08-Dec-2021</b>                             |
| <b>Sampler</b>                 | <b>: [REDACTED]</b>                                                      |                                |                                                  |
| <b>Site</b>                    | <b>: DEF19009/Learmonth</b>                                              |                                |                                                  |
| <b>Quote number</b>            | <b>: SY/139/19</b>                                                       |                                |                                                  |
| <b>No. of samples received</b> | <b>: 5</b>                                                               |                                |                                                  |
| <b>No. of samples analysed</b> | <b>: 5</b>                                                               |                                |                                                  |



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]         | Laboratory Manager (Perth) | Perth Inorganics, Wangara, WA    |
| [REDACTED]         | LCMS Coordinator           | Sydney Organics, Smithfield, NSW |



## 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**

| Sub-Matrix: WATER                                                 |                   |                                          |             | Laboratory Duplicate (DUP) Report |      |                 |                  |         |                    |
|-------------------------------------------------------------------|-------------------|------------------------------------------|-------------|-----------------------------------|------|-----------------|------------------|---------|--------------------|
| Laboratory sample ID                                              | Sample ID         | Method: Compound                         | CAS Number  | LOR                               | Unit | Original Result | Duplicate Result | RPD (%) | Acceptable RPD (%) |
| ED037P: Alkalinity by PC Titrator (QC Lot: 4057652)               |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2114554-001                                                     | Anonymous         | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 680             | 683              | 0.4     | 0% - 20%           |
|                                                                   |                   | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 680             | 683              | 0.4     | 0% - 20%           |
| EP2114327-022                                                     | Anonymous         | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 2               | 2                | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 2               | 2                | 0.0     | No Limit           |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4044096) |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2114477-001                                                     | 0960_MW170_211125 | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 1510            | 1480             | 2.1     | 0% - 20%           |
| EP2114575-005                                                     | Anonymous         | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 10              | 10               | 0.0     | 0% - 50%           |
| ED045G: Chloride by Discrete Analyser (QC Lot: 4044095)           |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2114477-001                                                     | 0960_MW170_211125 | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 15000           | 14800            | 1.2     | 0% - 20%           |
| EP2114575-005                                                     | Anonymous         | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 29              | 29               | 0.0     | 0% - 20%           |
| ED093F: Dissolved Major Cations (QC Lot: 4045345)                 |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2114471-001                                                     | Anonymous         | ED093F: Calcium                          | 7440-70-2   | 1                                 | mg/L | 456             | 471              | 3.2     | 0% - 20%           |
|                                                                   |                   | ED093F: Magnesium                        | 7439-95-4   | 1                                 | mg/L | 1500            | 1540             | 3.1     | 0% - 20%           |
|                                                                   |                   | ED093F: Sodium                           | 7440-23-5   | 1                                 | mg/L | 11600           | 12000            | 2.9     | 0% - 20%           |
|                                                                   |                   | ED093F: Potassium                        | 7440-09-7   | 1                                 | mg/L | 588             | 606              | 3.0     | 0% - 20%           |
| EP2114473-001                                                     | Anonymous         | ED093F: Calcium                          | 7440-70-2   | 1                                 | mg/L | 487             | 471              | 3.4     | 0% - 20%           |
|                                                                   |                   | ED093F: Magnesium                        | 7439-95-4   | 1                                 | mg/L | 1570            | 1530             | 3.0     | 0% - 20%           |
|                                                                   |                   | ED093F: Sodium                           | 7440-23-5   | 1                                 | mg/L | 12300           | 11800            | 4.3     | 0% - 20%           |
|                                                                   |                   | ED093F: Potassium                        | 7440-09-7   | 1                                 | mg/L | 618             | 600              | 3.0     | 0% - 20%           |



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: 4053879)   |           |                                                                   |            |                                   |      |                 |                  |         |                    |
| EP2114474-001                                             | 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           |
| EP2114474-008                                             | Anonymous | EP231X: Perfluorohexane sulfonic acid (PFHxS)                     | 355-46-4   | 0.01                              | µg/L | 0.05            | 0.07             | 23.4    | 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 | 0.06            | 0.08             | 28.7    | 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: 4053879) |           |                                                                   |            |                                   |      |                 |                  |         |                    |
| EP2114474-001                                             | 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           |
| EP2114474-008                                             | Anonymous | EP231X: Perfluorooctanoic acid (PFOA)                             | 335-67-1   | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
|                                                           |           | EP231X: Perfluoropentanoic acid (PFPeA)                           | 2706-90-3  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |           | EP231X: Perfluorohexanoic acid (PFHxA)                            | 307-24-4   | 0.02                              | µg/L | <0.02           | <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: 4053879)     |           |                                                                   |            |                                   |      |                 |                  |         |                    |
| EP2114474-001                                             | Anonymous | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |           | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |

| Sub-Matrix: WATER                                                 |           |                                                                   |             | Laboratory 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: 4053879) - continued |           |                                                                   |             |                                   |      |                 |                  |         |                    |
| EP2114474-001                                                     | Anonymous | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                   |           | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |           | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |           | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |           | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
| EP2114474-008                                                     | Anonymous | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                   |           | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                   |           | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                   |           | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |           | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |           | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |           | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4053879)      |           |                                                                   |             |                                   |      |                 |                  |         |                    |
| EP2114474-001                                                     | 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           |
| EP2114474-008                                                     | Anonymous | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |           | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 27619-97-2  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |           | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | 39108-34-4  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |           | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | 120226-60-0 | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
| EP231P: PFAS Sums (QC Lot: 4053879)                               |           |                                                                   |             |                                   |      |                 |                  |         |                    |



Sub-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: 4053879) - continued |           |                     |            |                                   |      |                 |                  |         |                    |
| EP2114474-001                                   | Anonymous | EP231X: Sum of PFAS | ----       | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
| EP2114474-008                                   | Anonymous | EP231X: Sum of PFAS | ----       | 0.01                              | µg/L | 0.11            | 0.17             | 42.9    | 0% - 50%           |





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

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

Sub-Matrix: **WATER**

| Sub-Matrix: WATER                                                |                 |      |      | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |      |
|------------------------------------------------------------------|-----------------|------|------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|------|
|                                                                  |                 |      |      |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |      |
| Method: Compound                                                 | CAS Number      | LOR  | Unit | Result                      |                                       |                           |                                   |      |
| ED037P: Alkalinity by PC Titrator (QCLot: 4057652)               |                 |      |      |                             |                                       |                           |                                   |      |
| ED037-P: Hydroxide Alkalinity as CaCO3                           | DMO-210-00<br>1 | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Carbonate Alkalinity as CaCO3                           | 3812-32-6       | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Bicarbonate Alkalinity as CaCO3                         | 71-52-3         | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Total Alkalinity as CaCO3                               | ----            | 1    | mg/L | <1                          | 20 mg/L                               | 111                       | 81.2                              | 126  |
|                                                                  |                 |      |      | <1                          | 200 mg/L                              | 98.6                      | 90.0                              | 110  |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4044096) |                 |      |      |                             |                                       |                           |                                   |      |
| ED041G: Sulfate as SO4 - Turbidimetric                           | 14808-79-8      | 1    | mg/L | <1                          | 25 mg/L                               | 101                       | 87.7                              | 113  |
|                                                                  |                 |      |      | <1                          | 500 mg/L                              | 104                       | 87.7                              | 113  |
| ED045G: Chloride by Discrete Analyser (QCLot: 4044095)           |                 |      |      |                             |                                       |                           |                                   |      |
| ED045G: Chloride                                                 | 16887-00-6      | 1    | mg/L | <1                          | 10 mg/L                               | 97.3                      | 87.9                              | 114  |
|                                                                  |                 |      |      | <1                          | 1000 mg/L                             | 106                       | 87.9                              | 114  |
| ED093F: Dissolved Major Cations (QCLot: 4045345)                 |                 |      |      |                             |                                       |                           |                                   |      |
| ED093F: Calcium                                                  | 7440-70-2       | 1    | mg/L | <1                          | 50 mg/L                               | 103                       | 85.9                              | 113  |
| ED093F: Magnesium                                                | 7439-95-4       | 1    | mg/L | <1                          | 50 mg/L                               | 105                       | 88.0                              | 110  |
| ED093F: Sodium                                                   | 7440-23-5       | 1    | mg/L | <1                          | 50 mg/L                               | 108                       | 87.3                              | 118  |
| ED093F: Potassium                                                | 7440-09-7       | 1    | mg/L | <1                          | 50 mg/L                               | 94.8                      | 89.7                              | 108  |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4053879)           |                 |      |      |                             |                                       |                           |                                   |      |
| EP231X: Perfluorobutane sulfonic acid (PFBS)                     | 375-73-5        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 100                       | 72.0                              | 130  |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)                   | 2706-91-4       | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 110                       | 71.0                              | 127  |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)                    | 355-46-4        | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 113                       | 68.0                              | 131  |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)                   | 375-92-8        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 103                       | 69.0                              | 134  |
| EP231X: Perfluorooctane sulfonic acid (PFOS)                     | 1763-23-1       | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 102                       | 65.0                              | 140  |
| EP231X: Perfluorodecane sulfonic acid (PFDS)                     | 335-77-3        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 69.8                      | 53.0                              | 142  |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4054342)           |                 |      |      |                             |                                       |                           |                                   |      |
| EP231X: Perfluorobutane sulfonic acid (PFBS)                     | 375-73-5        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 118                       | 72.0                              | 130  |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)                   | 2706-91-4       | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 117                       | 71.0                              | 127  |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)                    | 355-46-4        | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 104                       | 68.0                              | 131  |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)                   | 375-92-8        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 103                       | 69.0                              | 134  |
| EP231X: Perfluorooctane sulfonic acid (PFOS)                     | 1763-23-1       | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 101                       | 65.0                              | 140  |
| EP231X: Perfluorodecane sulfonic acid (PFDS)                     | 335-77-3        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 94.8                      | 53.0                              | 142  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4053879)         |                 |      |      |                             |                                       |                           |                                   |      |
| 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                             | 116                       | 72.0                              | 129  |



Sub-Matrix: **WATER**

|                                                                             |            |      |      | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                       |      |
|-----------------------------------------------------------------------------|------------|------|------|-----------------------------|---------------------------------------|---------------------------|-----------------------|------|
|                                                                             |            |      |      |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%) |      |
| Method: Compound                                                            | CAS Number | LOR  | Unit | Result                      |                                       |                           | Low                   | High |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4053879) - continued</b> |            |      |      |                             |                                       |                           |                       |      |
| EP231X: Perfluorohexanoic acid (PFHxA)                                      | 307-24-4   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 106                       | 72.0                  | 129  |
| EP231X: Perfluoroheptanoic acid (PFHpA)                                     | 375-85-9   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 125                       | 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                             | 105                       | 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                             | 84.4                      | 69.0                  | 133  |
| EP231X: Perfluorododecanoic acid (PFDoDA)                                   | 307-55-1   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 123                       | 72.0                  | 134  |
| EP231X: Perfluorotridecanoic acid (PFTrDA)                                  | 72629-94-8 | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 67.8                      | 65.0                  | 144  |
| EP231X: Perfluorotetradecanoic acid (PFTeDA)                                | 376-06-7   | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 124                       | 71.0                  | 132  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4054342)</b>             |            |      |      |                             |                                       |                           |                       |      |
| EP231X: Perfluorobutanoic acid (PFBA)                                       | 375-22-4   | 0.1  | µg/L | <0.1                        | 1.25 µg/L                             | 118                       | 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                             | 125                       | 72.0                  | 129  |
| EP231X: Perfluoroheptanoic acid (PFHpA)                                     | 375-85-9   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 124                       | 72.0                  | 130  |
| EP231X: Perfluorooctanoic acid (PFOA)                                       | 335-67-1   | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 121                       | 71.0                  | 133  |
| EP231X: Perfluorononanoic acid (PFNA)                                       | 375-95-1   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 121                       | 69.0                  | 130  |
| EP231X: Perfluorodecanoic acid (PFDA)                                       | 335-76-2   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 121                       | 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                             | 115                       | 72.0                  | 134  |
| EP231X: Perfluorotridecanoic acid (PFTrDA)                                  | 72629-94-8 | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 123                       | 65.0                  | 144  |
| EP231X: Perfluorotetradecanoic acid (PFTeDA)                                | 376-06-7   | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 129                       | 71.0                  | 132  |
| <b>EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4053879)</b>                 |            |      |      |                             |                                       |                           |                       |      |
| EP231X: Perfluorooctane sulfonamide (FOSA)                                  | 754-91-6   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 116                       | 67.0                  | 137  |
| EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)                       | 31506-32-8 | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 131                       | 68.0                  | 141  |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)                        | 4151-50-2  | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 104                       | 62.6                  | 147  |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)                | 24448-09-7 | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 134                       | 66.0                  | 145  |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)                 | 1691-99-2  | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 107                       | 57.6                  | 145  |
| EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)           | 2355-31-9  | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 122                       | 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  |
| <b>EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4054342)</b>                 |            |      |      |                             |                                       |                           |                       |      |
| EP231X: Perfluorooctane sulfonamide (FOSA)                                  | 754-91-6   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 126                       | 67.0                  | 137  |
| EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)                       | 31506-32-8 | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 132                       | 68.0                  | 141  |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)                        | 4151-50-2  | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 107                       | 62.6                  | 147  |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)                | 24448-09-7 | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 121                       | 66.0                  | 145  |

| Sub-Matrix: WATER                                                |                   |                                                |            | Matrix Spike (MS) Report |                  |                       |      |
|------------------------------------------------------------------|-------------------|------------------------------------------------|------------|--------------------------|------------------|-----------------------|------|
|                                                                  |                   |                                                |            | Spike                    | SpikeRecovery(%) | Acceptable Limits (%) |      |
| Laboratory sample ID                                             | Sample ID         | Method: Compound                               | CAS Number | Concentration            | MS               | Low                   | High |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4044096) |                   |                                                |            |                          |                  |                       |      |
| EP2114477-001                                                    | 0960_MW170_211125 | ED041G: Sulfate as SO4 - Turbidimetric         | 14808-79-8 | 100 mg/L                 | # Not Determined | 70.0                  | 130  |
| ED045G: Chloride by Discrete Analyser (QCLot: 4044095)           |                   |                                                |            |                          |                  |                       |      |
| EP2114477-001                                                    | 0960_MW170_211125 | ED045G: Chloride                               | 16887-00-6 | 1000 mg/L                | # Not Determined | 70.0                  | 130  |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4053879)           |                   |                                                |            |                          |                  |                       |      |
| EP2114474-003                                                    | Anonymous         | EP231X: Perfluorobutane sulfonic acid (PFBS)   | 375-73-5   | 0.25 µg/L                | 79.0             | 72.0                  | 130  |
|                                                                  |                   | EP231X: Perfluoropentane sulfonic acid (PFPeS) | 2706-91-4  | 0.25 µg/L                | 106              | 71.0                  | 127  |
|                                                                  |                   | EP231X: Perfluorohexane sulfonic acid (PFHxS)  | 355-46-4   | 0.25 µg/L                | 101              | 68.0                  | 131  |
|                                                                  |                   | EP231X: Perfluoroheptane sulfonic acid (PFHpS) | 375-92-8   | 0.25 µg/L                | 91.4             | 69.0                  | 134  |
|                                                                  |                   | EP231X: Perfluorooctane sulfonic acid (PFOS)   | 1763-23-1  | 0.25 µg/L                | 91.8             | 65.0                  | 140  |
|                                                                  |                   | EP231X: Perfluorodecane sulfonic acid (PFDS)   | 335-77-3   | 0.25 µg/L                | 91.8             | 53.0                  | 142  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4053879)         |                   |                                                |            |                          |                  |                       |      |



Sub-Matrix: **WATER**

| 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: 4053879) - continued |           |                                                                   |             |                          |                  |                       |      |
| EP2114474-003                                                        | Anonymous | EP231X: Perfluorobutanoic acid (PFBA)                             | 375-22-4    | 1.25 µg/L                | 101              | 73.0                  | 129  |
|                                                                      |           | EP231X: Perfluoropentanoic acid (PFPeA)                           | 2706-90-3   | 0.25 µg/L                | 107              | 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                | 112              | 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                | 95.4             | 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                | 87.2             | 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                | 99.4             | 65.0                  | 144  |
|                                                                      |           | EP231X: Perfluorotetradecanoic acid (PFTeDA)                      | 376-06-7    | 0.625 µg/L               | 118              | 71.0                  | 132  |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4053879)                 |           |                                                                   |             |                          |                  |                       |      |
| EP2114474-003                                                        | Anonymous | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.25 µg/L                | 106              | 67.0                  | 137  |
|                                                                      |           | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.625 µg/L               | 129              | 68.0                  | 141  |
|                                                                      |           | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.625 µg/L               | 106              | 62.6                  | 147  |
|                                                                      |           | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.625 µg/L               | 118              | 66.0                  | 145  |
|                                                                      |           | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.625 µg/L               | 110              | 57.6                  | 145  |
|                                                                      |           | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9   | 0.25 µg/L                | 111              | 65.0                  | 136  |
|                                                                      |           | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.25 µg/L                | 86.6             | 61.0                  | 135  |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4053879)          |           |                                                                   |             |                          |                  |                       |      |
| EP2114474-003                                                        | Anonymous | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.25 µg/L                | 94.2             | 63.0                  | 143  |
|                                                                      |           | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 27619-97-2  | 0.25 µg/L                | 95.6             | 64.0                  | 140  |
|                                                                      |           | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | 39108-34-4  | 0.25 µg/L                | 116              | 67.0                  | 138  |
|                                                                      |           | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | 120226-60-0 | 0.25 µg/L                | 143              | 71.4                  | 144  |

## QA/QC Compliance Assessment to assist with Quality Review

Work Order : EP2114477

Page : 1 of 5

Client : CARDNO (WA) PTY LTD

Contact : [REDACTED]

Project : WA\_0960\_PFASOMP

Site : DEF19009/Learmonth

Sampler : [REDACTED]

Order number : DEF19009/0960

Laboratory : Environmental Division Perth

Telephone : +61-8-9406 1301

Date Samples Received : 29-Nov-2021

Issue Date : 08-Dec-2021

No. of samples received : 5

No. of samples analysed : 5

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

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

### Summary of Outliers

#### Outliers : Quality Control Samples

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

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

#### Outliers : Analysis Holding Time Compliance

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

#### Outliers : Frequency of Quality Control Samples

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

Page : 2 of 5  
 Work Order : EP2114477  
 Client : CARDNO (WA) PTY LTD  
 Project : WA\_0960\_PFASOMP



### 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                                                                               |
|-------------------------------------------------------------|----------------------|-------------------|--------------------------------------------|------------|----------------|--------|---------------------------------------------------------------------------------------|
| <b>Matrix Spike (MS) Recoveries</b>                         |                      |                   |                                            |            |                |        |                                                                                       |
| ED041G: Sulfate (Turbidimetric) as SO <sub>4</sub> 2- by DA | EP2114477--001       | 0960_MW170_211125 | Sulfate as SO <sub>4</sub> - Turbidimetric | 14808-79-8 | Not Determined | ----   | MS recovery not determined, background level greater than or equal to 4x spike level. |
| ED045G: Chloride by Discrete Analyser                       | EP2114477--001       | 0960_MW170_211125 | Chloride                                   | 16887-00-6 | Not Determined | ----   | MS recovery not determined, background level greater than or equal to 4x spike level. |

### Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

| Quality Control Sample Type                          | Count |         | Rate (%) |          | Quality Control Specification  |
|------------------------------------------------------|-------|---------|----------|----------|--------------------------------|
| Method                                               | QC    | Regular | Actual   | Expected |                                |
| <b>Laboratory Duplicates (DUP)</b>                   |       |         |          |          |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | 2     | 32      | 6.25     | 10.00    | NEPM 2013 B3 & ALS QC Standard |
| <b>Matrix Spikes (MS)</b>                            |       |         |          |          |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | 1     | 32      | 3.13     | 5.00     | NEPM 2013 B3 & ALS QC Standard |

## Analysis Holding Time Compliance

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

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

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

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

Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                                        | Sample Date                              | Extraction / Preparation |                    |            | Analysis      |                  |             |   |
|---------------------------------------------------------------|------------------------------------------|--------------------------|--------------------|------------|---------------|------------------|-------------|---|
| Container / Client Sample ID(s)                               |                                          | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation  |   |
| ED037P: Alkalinity by PC Titrator                             |                                          |                          |                    |            |               |                  |             |   |
| Clear Plastic Bottle - Natural (ED037-P)                      |                                          |                          |                    |            |               |                  |             |   |
| 0960_MW170_211125,<br>0960_MW159_211125,<br>0960_MW115_211125 | 0960_MW172_211125,<br>0960_MW134_211125, | 25-Nov-2021              | ----               | ----       | ----          | 06-Dec-2021      | 09-Dec-2021 | ✔ |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA               |                                          |                          |                    |            |               |                  |             |   |
| Clear Plastic Bottle - Natural (ED041G)                       |                                          |                          |                    |            |               |                  |             |   |
| 0960_MW170_211125,<br>0960_MW159_211125,<br>0960_MW115_211125 | 0960_MW172_211125,<br>0960_MW134_211125, | 25-Nov-2021              | ----               | ----       | ----          | 01-Dec-2021      | 23-Dec-2021 | ✔ |





Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                     |                    | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |
|--------------------------------------------|--------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|
| Container / Client Sample ID(s)            |                    |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| ED045G: Chloride by Discrete Analyser      |                    |             |                          |                    |            |               |                  |            |
| Clear Plastic Bottle - Natural (ED045G)    |                    |             |                          |                    |            |               |                  |            |
| 0960_MW170_211125,                         | 0960_MW172_211125, | 25-Nov-2021 | ----                     | ----               | ----       | 01-Dec-2021   | 23-Dec-2021      | ✓          |
| 0960_MW159_211125,                         | 0960_MW134_211125, |             |                          |                    |            |               |                  |            |
| 0960_MW115_211125                          |                    |             |                          |                    |            |               |                  |            |
| ED093F: Dissolved Major Cations            |                    |             |                          |                    |            |               |                  |            |
| Clear Plastic Bottle - Natural (ED093F)    |                    |             |                          |                    |            |               |                  |            |
| 0960_MW170_211125,                         | 0960_MW172_211125, | 25-Nov-2021 | ----                     | ----               | ----       | 02-Dec-2021   | 02-Dec-2021      | ✓          |
| 0960_MW159_211125,                         | 0960_MW134_211125, |             |                          |                    |            |               |                  |            |
| 0960_MW115_211125                          |                    |             |                          |                    |            |               |                  |            |
| EP231A: Perfluoroalkyl Sulfonic Acids      |                    |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                    |                    |             |                          |                    |            |               |                  |            |
| 0960_MW170_211125,                         | 0960_MW172_211125, | 25-Nov-2021 | 06-Dec-2021              | 24-May-2022        | ✓          | 07-Dec-2021   | 24-May-2022      | ✓          |
| 0960_MW159_211125,                         | 0960_MW134_211125, |             |                          |                    |            |               |                  |            |
| 0960_MW115_211125                          |                    |             |                          |                    |            |               |                  |            |
| EP231B: Perfluoroalkyl Carboxylic Acids    |                    |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                    |                    |             |                          |                    |            |               |                  |            |
| 0960_MW170_211125,                         | 0960_MW172_211125, | 25-Nov-2021 | 06-Dec-2021              | 24-May-2022        | ✓          | 07-Dec-2021   | 24-May-2022      | ✓          |
| 0960_MW159_211125,                         | 0960_MW134_211125, |             |                          |                    |            |               |                  |            |
| 0960_MW115_211125                          |                    |             |                          |                    |            |               |                  |            |
| EP231C: Perfluoroalkyl Sulfonamides        |                    |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                    |                    |             |                          |                    |            |               |                  |            |
| 0960_MW170_211125,                         | 0960_MW172_211125, | 25-Nov-2021 | 06-Dec-2021              | 24-May-2022        | ✓          | 07-Dec-2021   | 24-May-2022      | ✓          |
| 0960_MW159_211125,                         | 0960_MW134_211125, |             |                          |                    |            |               |                  |            |
| 0960_MW115_211125                          |                    |             |                          |                    |            |               |                  |            |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids |                    |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                    |                    |             |                          |                    |            |               |                  |            |
| 0960_MW170_211125,                         | 0960_MW172_211125, | 25-Nov-2021 | 06-Dec-2021              | 24-May-2022        | ✓          | 07-Dec-2021   | 24-May-2022      | ✓          |
| 0960_MW159_211125,                         | 0960_MW134_211125, |             |                          |                    |            |               |                  |            |
| 0960_MW115_211125                          |                    |             |                          |                    |            |               |                  |            |
| EP231P: PFAS Sums                          |                    |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                    |                    |             |                          |                    |            |               |                  |            |
| 0960_MW170_211125,                         | 0960_MW172_211125, | 25-Nov-2021 | 06-Dec-2021              | 24-May-2022        | ✓          | 07-Dec-2021   | 24-May-2022      | ✓          |
| 0960_MW159_211125,                         | 0960_MW134_211125, |             |                          |                    |            |               |                  |            |
| 0960_MW115_211125                          |                    |             |                          |                    |            |               |                  |            |



## Quality Control Parameter Frequency Compliance

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

Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

| Quality Control Sample Type                            |         | Count |         | Rate (%) |          |            | Quality Control Specification  |
|--------------------------------------------------------|---------|-------|---------|----------|----------|------------|--------------------------------|
| Analytical Methods                                     | Method  | QC    | Regular | Actual   | Expected | Evaluation |                                |
|                                                        |         |       |         |          |          |            |                                |
| Laboratory Duplicates (DUP)                            |         |       |         |          |          |            |                                |
| Alkalinity by PC Titrator                              | ED037-P | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 2     | 19      | 10.53    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 2     | 19      | 10.53    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 2     | 32      | 6.25     | 10.00    | ✗          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 2     | 19      | 10.53    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Laboratory Control Samples (LCS)                       |         |       |         |          |          |            |                                |
| Alkalinity by PC Titrator                              | ED037-P | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 2     | 19      | 10.53    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 1     | 19      | 5.26     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 2     | 32      | 6.25     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 2     | 19      | 10.53    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Method Blanks (MB)                                     |         |       |         |          |          |            |                                |
| Alkalinity by PC Titrator                              | ED037-P | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 1     | 19      | 5.26     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 1     | 19      | 5.26     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 2     | 32      | 6.25     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 1     | 19      | 5.26     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Matrix Spikes (MS)                                     |         |       |         |          |          |            |                                |
| Chloride by Discrete Analyser                          | ED045G  | 1     | 19      | 5.26     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 32      | 3.13     | 5.00     | ✗          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 1     | 19      | 5.26     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |



## Brief Method Summaries

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

| Analytical Methods                                                 | Method       | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------------------|--------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alkalinity by PC Titrator                                          | ED037-P      | WATER  | In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                                                                                                                                                                                                                |
| Sulfate (Turbidimetric) as SO <sub>4</sub> 2- by Discrete Analyser | ED041G       | WATER  | In house: Referenced to APHA 4500-SO <sub>4</sub> . Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO <sub>4</sub> suspension is measured by a photometer and the SO <sub>4</sub> -2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                         |
| Chloride by Discrete Analyser                                      | ED045G       | WATER  | In house: Referenced to APHA 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA seal method 2 017-1-L                                                                                                                                                                                                                                                                                                                                      |
| Major Cations - Dissolved                                          | ED093F       | WATER  | In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                           |
| Ionic Balance by PCT DA and Turbi SO <sub>4</sub> DA               | * EN055 - PG | WATER  | In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS               | EP231X       | WATER  | In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements. |
| Preparation Methods                                                | Method       | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Solid Phase Extraction (SPE) for PFAS in water                     | ORG72        | WATER  | In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.                                                                                                                                                                                                |

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Submission of samples to the laboratory will be deemed as acceptance of Eurofins | Environment Testing Standard Terms and Conditions unless agreed otherwise. A copy is available on request.



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email: EnviroSales@eurofins.com

**Company Name:** Cardno (WA)  
**Address:** 11 Harvest Terrace  
West Perth  
WA 6005

**Project Name:**  
**Project ID:** 960

**Order No.:** 19009/430  
**Report #:** 845088  
**Phone:** 08 9273 3888  
**Fax:** 08 9388 3831

**Received:** Nov 26, 2021 9:00 AM  
**Due:** Dec 3, 2021  
**Priority:** 5 Day  
**Contact Name:** [REDACTED]

Eurofins Analytical Services Manager : [REDACTED]

## Sample Detail

Moisture Set

Per- and Polyfluoroalkyl Substances (PFASs)

Perth Laboratory - NATA # 2377 Site # 2370

Melbourne Laboratory - NATA # 1261 Site # 1254

Sydney Laboratory - NATA # 1261 Site # 18217

Brisbane Laboratory - NATA # 1261 Site # 20794

Mayfield Laboratory - NATA # 1261 Site # 25079

External Laboratory

| No | Sample ID         | Sample Date  | Sampling Time | Matrix | LAB ID      |   |   |
|----|-------------------|--------------|---------------|--------|-------------|---|---|
| 1  | 0960_QC215_211124 | Nov 24, 2021 |               | Water  | L21-No68678 |   | X |
| 2  | 0960_QC216_211124 | Nov 24, 2021 |               | Water  | L21-No68679 |   | X |
| 3  | 0960_QC217_211124 | Nov 24, 2021 |               | Soil   | L21-No68680 | X | X |
| 4  | 0960_QC218_211124 | Nov 24, 2021 |               | Water  | L21-No68681 |   | X |
| 5  | 0960_QC219_211124 | Nov 24, 2021 |               | Soil   | L21-No68682 | X | X |
| 6  | 0960_QC220_       | Nov 24, 2021 |               | Water  | L21-No68683 |   | X |





ARL

## Eurofins ARL Pty Ltd

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NATA # 2377 Site # 2370

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**Melbourne**  
6 Monterey Road  
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**Sydney**  
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16 Mars Road  
Lane Cove West NSW 2066  
Phone : +61 2 9900 8400  
NATA # 1261 Site # 18217

**Brisbane**  
1/21 Smallwood Place  
Murarrie QLD 4172  
Phone : +61 7 3902 4600  
NATA # 1261 Site # 20794

**Newcastle**  
4/52 Industrial Drive  
Mayfield East NSW 2304  
PO Box 60 Wickham 2293  
Phone : +61 2 4968 8448  
NATA # 1261 Site # 25079

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**Contact Name:** [REDACTED]

Eurofins Analytical Services Manager : [REDACTED]

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Moisture Set

Per- and Polyfluoroalkyl Substances (PFASs)

Perth Laboratory - NATA # 2377 Site # 2370

Melbourne Laboratory - NATA # 1261 Site # 1254

Sydney Laboratory - NATA # 1261 Site # 18217

Brisbane Laboratory - NATA # 1261 Site # 20794

Mayfield Laboratory - NATA # 1261 Site # 25079

External Laboratory

|    |                   |              |  |       |             |   |   |
|----|-------------------|--------------|--|-------|-------------|---|---|
|    | 211124            |              |  |       |             |   |   |
| 7  | 0960_QC221_211124 | Nov 24, 2021 |  | Soil  | L21-No68684 | x | x |
| 8  | 0960_QC222_211124 | Nov 24, 2021 |  | Soil  | L21-No68685 | x | x |
| 9  | 0960_QC223_211124 | Nov 24, 2021 |  | Water | L21-No68686 |   | x |
| 10 | 0960_QC224_211124 | Nov 24, 2021 |  | Water | L21-No68687 |   | x |
| 11 | 0960_QC226_211124 | Nov 24, 2021 |  | Water | L21-No68688 |   | x |
| 12 | 0960_QC227_211124 | Nov 24, 2021 |  | Water | L21-No68689 |   | x |



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**Address:** 11 Harvest Terrace  
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WA 6005

**Project Name:**  
**Project ID:** 960

**Order No.:** 19009/430  
**Report #:** 845088  
**Phone:** 08 9273 3888  
**Fax:** 08 9388 3831

**Received:** Nov 26, 2021 9:00 AM  
**Due:** Dec 3, 2021  
**Priority:** 5 Day  
**Contact Name:** [REDACTED]

Eurofins Analytical Services Manager : [REDACTED]

Sample Detail

Moisture Set

Per- and Polyfluoroalkyl Substances (PFASs)

Perth Laboratory - NATA # 2377 Site # 2370

Melbourne Laboratory - NATA # 1261 Site # 1254

Sydney Laboratory - NATA # 1261 Site # 18217

Brisbane Laboratory - NATA # 1261 Site # 20794

Mayfield Laboratory - NATA # 1261 Site # 25079

External Laboratory

|    |                   |              |  |       |             |  |   |
|----|-------------------|--------------|--|-------|-------------|--|---|
| 13 | 0960_QC228_211124 | Nov 24, 2021 |  | Water | L21-No68690 |  | X |
|----|-------------------|--------------|--|-------|-------------|--|---|

Test Counts

4

13

Cardno Consulting WA  
11 Harvest Terrace  
West Perth  
WA 6005



NATA Accredited  
Accreditation Number 2377  
Site Number 2370

Accredited for compliance with ISO/IEC 17025 – Testing  
NATA is a signatory to the ILAC Mutual Recognition  
Arrangement for the mutual recognition of the  
equivalence of testing, medical testing, calibration,  
inspection, proficiency testing scheme providers and  
reference materials producers reports and certificates.

Attention:

Report **845088-S**  
Project name  
Project ID **960**  
Received Date Nov 26, 2021

| Client Sample ID                                                             |     |       | 0960_QC217_2<br>11124 | 0960_QC219_2<br>11124 | 0960_QC221_2<br>11124 | 0960_QC222_2<br>11124 |
|------------------------------------------------------------------------------|-----|-------|-----------------------|-----------------------|-----------------------|-----------------------|
| Sample Matrix                                                                |     |       | Soil                  | Soil                  | Soil                  | Soil                  |
| Eurofins Sample No.                                                          |     |       | L21-No68680           | L21-No68682           | L21-No68684           | L21-No68685           |
| Date Sampled                                                                 |     |       | Nov 24, 2021          | Nov 24, 2021          | Nov 24, 2021          | Nov 24, 2021          |
| Test/Reference                                                               | LOR | Unit  |                       |                       |                       |                       |
| % Moisture                                                                   | 1   | %     | 7.1                   | 27                    | 2.7                   | < 1                   |
| <b>Perfluoroalkyl carboxylic acids (PFCAs)</b>                               |     |       |                       |                       |                       |                       |
| Perfluorobutanoic acid (PFBA) <sup>N11</sup>                                 | 5   | ug/kg | < 5                   | < 5                   | < 5                   | < 5                   |
| Perfluoropentanoic acid (PFPeA) <sup>N11</sup>                               | 5   | ug/kg | < 5                   | < 5                   | < 5                   | < 5                   |
| Perfluorohexanoic acid (PFHxA) <sup>N11</sup>                                | 5   | ug/kg | < 5                   | < 5                   | < 5                   | < 5                   |
| Perfluoroheptanoic acid (PFHpA) <sup>N11</sup>                               | 5   | ug/kg | < 5                   | < 5                   | < 5                   | < 5                   |
| Perfluorooctanoic acid (PFOA) <sup>N11</sup>                                 | 5   | ug/kg | < 5                   | < 5                   | < 5                   | < 5                   |
| Perfluorononanoic acid (PFNA) <sup>N11</sup>                                 | 5   | ug/kg | < 5                   | < 5                   | < 5                   | < 5                   |
| Perfluorodecanoic acid (PFDA) <sup>N11</sup>                                 | 5   | ug/kg | < 5                   | < 5                   | < 5                   | < 5                   |
| Perfluoroundecanoic acid (PFUnDA) <sup>N11</sup>                             | 5   | ug/kg | < 5                   | < 5                   | < 5                   | < 5                   |
| Perfluorododecanoic acid (PFDoDA) <sup>N11</sup>                             | 5   | ug/kg | < 5                   | < 5                   | < 5                   | < 5                   |
| Perfluorotridecanoic acid (PFTTrDA) <sup>N15</sup>                           | 5   | ug/kg | < 5                   | < 5                   | < 5                   | < 5                   |
| Perfluorotetradecanoic acid (PFTeDA) <sup>N11</sup>                          | 5   | ug/kg | < 5                   | < 5                   | < 5                   | < 5                   |
| 13C4-PFBA (surr.)                                                            | 1   | %     | 101                   | 34                    | 89                    | 95                    |
| 13C5-PFPeA (surr.)                                                           | 1   | %     | 115                   | 30                    | 110                   | 113                   |
| 13C5-PFHxA (surr.)                                                           | 1   | %     | 129                   | 37                    | 105                   | 102                   |
| 13C4-PFHpA (surr.)                                                           | 1   | %     | 148                   | 52                    | 143                   | 152                   |
| 13C8-PFOA (surr.)                                                            | 1   | %     | 148                   | 71                    | 133                   | 142                   |
| 13C5-PFNA (surr.)                                                            | 1   | %     | 154                   | 75                    | 120                   | 119                   |
| 13C6-PFDA (surr.)                                                            | 1   | %     | 156                   | 76                    | 114                   | 131                   |
| 13C2-PFUnDA (surr.)                                                          | 1   | %     | 124                   | 87                    | 114                   | 120                   |
| 13C2-PFDoDA (surr.)                                                          | 1   | %     | 110                   | 84                    | 107                   | 108                   |
| 13C2-PFTeDA (surr.)                                                          | 1   | %     | 111                   | 76                    | 111                   | 115                   |
| <b>Perfluoroalkyl sulfonamido substances</b>                                 |     |       |                       |                       |                       |                       |
| Perfluorooctane sulfonamide (FOSA) <sup>N11</sup>                            | 5   | ug/kg | < 5                   | < 5                   | < 5                   | < 5                   |
| N-methylperfluoro-1-octane sulfonamide (N-MeFOSA) <sup>N11</sup>             | 5   | ug/kg | < 5                   | < 5                   | < 5                   | < 5                   |
| N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA) <sup>N11</sup>              | 5   | ug/kg | < 5                   | < 5                   | < 5                   | < 5                   |
| 2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) <sup>N11</sup> | 5   | ug/kg | < 5                   | < 5                   | < 5                   | < 5                   |
| 2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE) <sup>N11</sup>  | 5   | ug/kg | < 5                   | < 5                   | < 5                   | < 5                   |
| N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA) <sup>N11</sup>     | 10  | ug/kg | < 10                  | < 10                  | < 10                  | < 10                  |
| N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) <sup>N11</sup>    | 10  | ug/kg | < 10                  | < 10                  | < 10                  | < 10                  |

| Client Sample ID                                                      |     |       | 0960_QC217_2<br>11124 | 0960_QC219_2<br>11124 | 0960_QC221_2<br>11124 | 0960_QC222_2<br>11124 |
|-----------------------------------------------------------------------|-----|-------|-----------------------|-----------------------|-----------------------|-----------------------|
| Sample Matrix                                                         |     |       | Soil                  | Soil                  | Soil                  | Soil                  |
| Eurofins Sample No.                                                   |     |       | L21-No68680           | L21-No68682           | L21-No68684           | L21-No68685           |
| Date Sampled                                                          |     |       | Nov 24, 2021          | Nov 24, 2021          | Nov 24, 2021          | Nov 24, 2021          |
| Test/Reference                                                        | LOR | Unit  |                       |                       |                       |                       |
| <b>Perfluoroalkyl sulfonamido substances</b>                          |     |       |                       |                       |                       |                       |
| 13C8-FOSA (surr.)                                                     | 1   | %     | 110                   | 93                    | 104                   | 112                   |
| D3-N-MeFOSA (surr.)                                                   | 1   | %     | 107                   | 67                    | 97                    | 94                    |
| D5-N-EtFOSA (surr.)                                                   | 1   | %     | 95                    | 67                    | 86                    | 94                    |
| D7-N-MeFOSE (surr.)                                                   | 1   | %     | 108                   | 71                    | 115                   | 114                   |
| D9-N-EtFOSE (surr.)                                                   | 1   | %     | 115                   | 63                    | 91                    | 90                    |
| D5-N-EtFOSAA (surr.)                                                  | 1   | %     | 106                   | 69                    | 106                   | 107                   |
| D3-N-MeFOSAA (surr.)                                                  | 1   | %     | 100                   | 59                    | 98                    | 96                    |
| <b>Perfluoroalkyl sulfonic acids (PFASs)</b>                          |     |       |                       |                       |                       |                       |
| Perfluorobutanesulfonic acid (PFBS) <sup>N11</sup>                    | 5   | ug/kg | < 5                   | < 5                   | < 5                   | < 5                   |
| Perfluorononanesulfonic acid (PFNS) <sup>N15</sup>                    | 5   | ug/kg | < 5                   | < 5                   | < 5                   | < 5                   |
| Perfluoropropanesulfonic acid (PFPrS) <sup>N15</sup>                  | 5   | ug/kg | < 5                   | < 5                   | < 5                   | < 5                   |
| Perfluoropentanesulfonic acid (PFPeS) <sup>N15</sup>                  | 5   | ug/kg | < 5                   | < 5                   | < 5                   | < 5                   |
| Perfluorohexanesulfonic acid (PFHxS) <sup>N11</sup>                   | 5   | ug/kg | < 5                   | < 5                   | < 5                   | < 5                   |
| Perfluoroheptanesulfonic acid (PFHpS) <sup>N15</sup>                  | 5   | ug/kg | < 5                   | < 5                   | < 5                   | < 5                   |
| Perfluorooctanesulfonic acid (PFOS) <sup>N11</sup>                    | 5   | ug/kg | <sup>N09</sup> 5.0    | <sup>N09</sup> 19     | <sup>N09</sup> 14     | <sup>N09</sup> 35     |
| Perfluorodecanesulfonic acid (PFDS) <sup>N15</sup>                    | 5   | ug/kg | < 5                   | < 5                   | < 5                   | < 5                   |
| 13C3-PFBS (surr.)                                                     | 1   | %     | 137                   | 80                    | 121                   | 119                   |
| 18O2-PFHxS (surr.)                                                    | 1   | %     | 116                   | 81                    | 113                   | 117                   |
| 13C8-PFOS (surr.)                                                     | 1   | %     | 114                   | 98                    | 106                   | 104                   |
| <b>n:2 Fluorotelomer sulfonic acids (n:2 FTSA)</b>                    |     |       |                       |                       |                       |                       |
| 1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA) <sup>N11</sup>    | 5   | ug/kg | < 5                   | < 5                   | < 5                   | < 5                   |
| 1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA) <sup>N11</sup>    | 10  | ug/kg | < 10                  | < 10                  | < 10                  | < 10                  |
| 1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA) <sup>N11</sup>    | 5   | ug/kg | < 5                   | < 5                   | < 5                   | < 5                   |
| 1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA) <sup>N11</sup> | 5   | ug/kg | < 5                   | < 5                   | < 5                   | < 5                   |
| 13C2-4:2 FTSA (surr.)                                                 | 1   | %     | INT                   | 40                    | 142                   | 126                   |
| 13C2-6:2 FTSA (surr.)                                                 | 1   | %     | INT                   | 35                    | 100                   | 123                   |
| 13C2-8:2 FTSA (surr.)                                                 | 1   | %     | 196                   | 48                    | 111                   | 109                   |
| 13C2-10:2 FTSA (surr.)                                                | 1   | %     | 137                   | 74                    | 114                   | 117                   |
| <b>PFASs Summations</b>                                               |     |       |                       |                       |                       |                       |
| Sum (PFHxS + PFOS)*                                                   | 5   | ug/kg | 5                     | 19                    | 14                    | 35                    |
| Sum of US EPA PFAS (PFOS + PFOA)*                                     | 5   | ug/kg | 5                     | 19                    | 14                    | 35                    |
| Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*                           | 5   | ug/kg | 5                     | 19                    | 14                    | 35                    |
| Sum of WA DWER PFAS (n=10)*                                           | 10  | ug/kg | < 10                  | 19                    | 14                    | 35                    |
| Sum of PFASs (n=30)*                                                  | 50  | ug/kg | < 50                  | < 50                  | < 50                  | < 50                  |

|                                                                              |     |       |                       |
|------------------------------------------------------------------------------|-----|-------|-----------------------|
| Client Sample ID                                                             |     |       | 0960_QC225_2<br>11124 |
| Sample Matrix                                                                |     |       | Soil                  |
| Eurofins Sample No.                                                          |     |       | L21-No69449           |
| Date Sampled                                                                 |     |       | Nov 24, 2021          |
| Test/Reference                                                               | LOR | Unit  |                       |
|                                                                              |     |       |                       |
| % Moisture                                                                   | 1   | %     | 6.8                   |
| <b>Perfluoroalkyl carboxylic acids (PFCAs)</b>                               |     |       |                       |
| Perfluorobutanoic acid (PFBA) <sup>N11</sup>                                 | 5   | ug/kg | < 5                   |
| Perfluoropentanoic acid (PFPeA) <sup>N11</sup>                               | 5   | ug/kg | < 5                   |
| Perfluorohexanoic acid (PFHxA) <sup>N11</sup>                                | 5   | ug/kg | < 5                   |
| Perfluoroheptanoic acid (PFHpA) <sup>N11</sup>                               | 5   | ug/kg | < 5                   |
| Perfluorooctanoic acid (PFOA) <sup>N11</sup>                                 | 5   | ug/kg | < 5                   |
| Perfluorononanoic acid (PFNA) <sup>N11</sup>                                 | 5   | ug/kg | < 5                   |
| Perfluorodecanoic acid (PFDA) <sup>N11</sup>                                 | 5   | ug/kg | < 5                   |
| Perfluoroundecanoic acid (PFUnDA) <sup>N11</sup>                             | 5   | ug/kg | < 5                   |
| Perfluorododecanoic acid (PFDoDA) <sup>N11</sup>                             | 5   | ug/kg | < 5                   |
| Perfluorotridecanoic acid (PFTeDA) <sup>N15</sup>                            | 5   | ug/kg | < 5                   |
| Perfluorotetradecanoic acid (PFTeDA) <sup>N11</sup>                          | 5   | ug/kg | < 5                   |
| 13C4-PFBA (surr.)                                                            | 1   | %     | 95                    |
| 13C5-PFPeA (surr.)                                                           | 1   | %     | 129                   |
| 13C5-PFHxA (surr.)                                                           | 1   | %     | 144                   |
| 13C4-PFHpA (surr.)                                                           | 1   | %     | 178                   |
| 13C8-PFOA (surr.)                                                            | 1   | %     | 188                   |
| 13C5-PFNA (surr.)                                                            | 1   | %     | 153                   |
| 13C6-PFDA (surr.)                                                            | 1   | %     | 148                   |
| 13C2-PFUnDA (surr.)                                                          | 1   | %     | 125                   |
| 13C2-PFDoDA (surr.)                                                          | 1   | %     | 100                   |
| 13C2-PFTeDA (surr.)                                                          | 1   | %     | 94                    |
| <b>Perfluoroalkyl sulfonamido substances</b>                                 |     |       |                       |
| Perfluorooctane sulfonamide (FOSA) <sup>N11</sup>                            | 5   | ug/kg | < 5                   |
| N-methylperfluoro-1-octane sulfonamide (N-MeFOSA) <sup>N11</sup>             | 5   | ug/kg | < 5                   |
| N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA) <sup>N11</sup>              | 5   | ug/kg | < 5                   |
| 2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) <sup>N11</sup> | 5   | ug/kg | < 5                   |
| 2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE) <sup>N11</sup>  | 5   | ug/kg | < 5                   |
| N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA) <sup>N11</sup>     | 10  | ug/kg | < 10                  |
| N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) <sup>N11</sup>    | 10  | ug/kg | < 10                  |
| 13C8-FOSA (surr.)                                                            | 1   | %     | 97                    |
| D3-N-MeFOSA (surr.)                                                          | 1   | %     | 92                    |
| D5-N-EtFOSA (surr.)                                                          | 1   | %     | 84                    |
| D7-N-MeFOSE (surr.)                                                          | 1   | %     | 108                   |
| D9-N-EtFOSE (surr.)                                                          | 1   | %     | 85                    |
| D5-N-EtFOSAA (surr.)                                                         | 1   | %     | 100                   |
| D3-N-MeFOSAA (surr.)                                                         | 1   | %     | 96                    |
| <b>Perfluoroalkyl sulfonic acids (PFSAAs)</b>                                |     |       |                       |
| Perfluorobutanesulfonic acid (PFBS) <sup>N11</sup>                           | 5   | ug/kg | < 5                   |
| Perfluorononanesulfonic acid (PFNS) <sup>N15</sup>                           | 5   | ug/kg | < 5                   |
| Perfluoropropanesulfonic acid (PFPrS) <sup>N15</sup>                         | 5   | ug/kg | < 5                   |
| Perfluoropentanesulfonic acid (PFPeS) <sup>N15</sup>                         | 5   | ug/kg | < 5                   |
| Perfluorohexanesulfonic acid (PFHxS) <sup>N11</sup>                          | 5   | ug/kg | < 5                   |
| Perfluoroheptanesulfonic acid (PFHpS) <sup>N15</sup>                         | 5   | ug/kg | < 5                   |

|                                                                       |     |       |                     |
|-----------------------------------------------------------------------|-----|-------|---------------------|
| <b>Client Sample ID</b>                                               |     |       | <b>0960_QC225_2</b> |
| <b>Sample Matrix</b>                                                  |     |       | <b>Soil</b>         |
| <b>Eurofins Sample No.</b>                                            |     |       | <b>L21-No69449</b>  |
| <b>Date Sampled</b>                                                   |     |       | <b>Nov 24, 2021</b> |
| Test/Reference                                                        | LOR | Unit  |                     |
| <b>Perfluoroalkyl sulfonic acids (PFASs)</b>                          |     |       |                     |
| Perfluorooctanesulfonic acid (PFOS) <sup>N11</sup>                    | 5   | ug/kg | <sup>N09</sup> 6.0  |
| Perfluorodecanesulfonic acid (PFDS) <sup>N15</sup>                    | 5   | ug/kg | < 5                 |
| 13C3-PFBS (surr.)                                                     | 1   | %     | 120                 |
| 18O2-PFHxS (surr.)                                                    | 1   | %     | 123                 |
| 13C8-PFOS (surr.)                                                     | 1   | %     | 127                 |
| <b>n:2 Fluorotelomer sulfonic acids (n:2 FTSA)</b>                    |     |       |                     |
| 1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA) <sup>N11</sup>    | 5   | ug/kg | < 5                 |
| 1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA) <sup>N11</sup>    | 10  | ug/kg | < 10                |
| 1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA) <sup>N11</sup>    | 5   | ug/kg | < 5                 |
| 1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA) <sup>N11</sup> | 5   | ug/kg | < 5                 |
| 13C2-4:2 FTSA (surr.)                                                 | 1   | %     | INT                 |
| 13C2-6:2 FTSA (surr.)                                                 | 1   | %     | INT                 |
| 13C2-8:2 FTSA (surr.)                                                 | 1   | %     | 199                 |
| 13C2-10:2 FTSA (surr.)                                                | 1   | %     | 123                 |
| <b>PFASs Summations</b>                                               |     |       |                     |
| Sum (PFHxS + PFOS)*                                                   | 5   | ug/kg | 6                   |
| Sum of US EPA PFAS (PFOS + PFOA)*                                     | 5   | ug/kg | 6                   |
| Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*                           | 5   | ug/kg | 6                   |
| Sum of WA DWER PFAS (n=10)*                                           | 10  | ug/kg | < 10                |
| Sum of PFASs (n=30)*                                                  | 50  | ug/kg | < 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<br>- Method: LTM-GEN-7080 Moisture                                                                     | Brisbane     | Nov 29, 2021 | 14 Days      |
| Per- and Polyfluoroalkyl Substances (PFASs)                                                                       |              |              |              |
| Perfluoroalkyl carboxylic acids (PFCAs)<br>- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)      | Brisbane     | Dec 01, 2021 | 28 Days      |
| Perfluoroalkyl sulfonamido substances<br>- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)        | Brisbane     | Dec 01, 2021 | 28 Days      |
| Perfluoroalkyl sulfonic acids (PFSAs)<br>- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)        | Brisbane     | Dec 01, 2021 | 28 Days      |
| n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)<br>- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) | Brisbane     | Dec 01, 2021 | 28 Days      |

**Company Name:** Cardno (WA)  
**Address:** 11 Harvest Terrace  
West Perth  
WA 6005

**Project Name:**  
**Project ID:** 960

**Order No.:** 19009/430  
**Report #:** 845088  
**Phone:** 08 9273 3888  
**Fax:** 08 9388 3831

**Received:** Nov 26, 2021 9:00 AM  
**Due:** Dec 3, 2021  
**Priority:** 5 Day  
**Contact Name:** [REDACTED]

**Eurofins Analytical Services Manager :** [REDACTED]

| Sample Detail                                  |                   |              |               |        |             | Moisture Set | Per- and Polyfluoroalkyl Substances (PFASs) |
|------------------------------------------------|-------------------|--------------|---------------|--------|-------------|--------------|---------------------------------------------|
| Perth Laboratory - NATA # 2377 Site # 2370     |                   |              |               |        |             |              |                                             |
| Melbourne Laboratory - NATA # 1261 Site # 1254 |                   |              |               |        |             |              |                                             |
| Sydney Laboratory - NATA # 1261 Site # 18217   |                   |              |               |        |             |              |                                             |
| Brisbane Laboratory - NATA # 1261 Site # 20794 |                   |              |               |        |             | X            | X                                           |
| Mayfield Laboratory - NATA # 1261 Site # 25079 |                   |              |               |        |             |              |                                             |
| External Laboratory                            |                   |              |               |        |             |              |                                             |
| No                                             | Sample ID         | Sample Date  | Sampling Time | Matrix | LAB ID      |              |                                             |
| 1                                              | 0960_QC215_211124 | Nov 24, 2021 |               | Water  | L21-No68678 |              | X                                           |
| 2                                              | 0960_QC216_211124 | Nov 24, 2021 |               | Water  | L21-No68679 |              | X                                           |
| 3                                              | 0960_QC217_211124 | Nov 24, 2021 |               | Soil   | L21-No68680 | X            | X                                           |
| 4                                              | 0960_QC218_211124 | Nov 24, 2021 |               | Water  | L21-No68681 |              | X                                           |
| 5                                              | 0960_QC219_211124 | Nov 24, 2021 |               | Soil   | L21-No68682 | X            | X                                           |
| 6                                              | 0960_QC220_       | Nov 24, 2021 |               | Water  | L21-No68683 |              | X                                           |

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**Priority:** 5 Day  
**Contact Name:** [REDACTED]

**Eurofins Analytical Services Manager :** [REDACTED]

| Sample Detail                                  |                   |              |  |       |             | Moisture Set | Per- and Polyfluoroalkyl Substances (PFASs) |
|------------------------------------------------|-------------------|--------------|--|-------|-------------|--------------|---------------------------------------------|
| Perth Laboratory - NATA # 2377 Site # 2370     |                   |              |  |       |             |              |                                             |
| Melbourne Laboratory - NATA # 1261 Site # 1254 |                   |              |  |       |             |              |                                             |
| Sydney Laboratory - NATA # 1261 Site # 18217   |                   |              |  |       |             |              |                                             |
| Brisbane Laboratory - NATA # 1261 Site # 20794 |                   |              |  |       |             | X            | X                                           |
| Mayfield Laboratory - NATA # 1261 Site # 25079 |                   |              |  |       |             |              |                                             |
| External Laboratory                            |                   |              |  |       |             |              |                                             |
|                                                | 211124            |              |  |       |             |              |                                             |
| 7                                              | 0960_QC221_211124 | Nov 24, 2021 |  | Soil  | L21-No68684 | X            | X                                           |
| 8                                              | 0960_QC222_211124 | Nov 24, 2021 |  | Soil  | L21-No68685 | X            | X                                           |
| 9                                              | 0960_QC223_211124 | Nov 24, 2021 |  | Water | L21-No68686 |              | X                                           |
| 10                                             | 0960_QC224_211124 | Nov 24, 2021 |  | Water | L21-No68687 |              | X                                           |
| 11                                             | 0960_QC226_211124 | Nov 24, 2021 |  | Water | L21-No68688 |              | X                                           |
| 12                                             | 0960_QC227_211124 | Nov 24, 2021 |  | Water | L21-No68689 |              | X                                           |

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**Contact Name:** [REDACTED]

**Eurofins Analytical Services Manager :** [REDACTED]

|                                                |                   |              |  |       |             |              |                                             |
|------------------------------------------------|-------------------|--------------|--|-------|-------------|--------------|---------------------------------------------|
| Sample Detail                                  |                   |              |  |       |             | Moisture Set | Per- and Polyfluoroalkyl Substances (PFASs) |
|                                                |                   |              |  |       |             |              |                                             |
|                                                |                   |              |  |       |             |              |                                             |
|                                                |                   |              |  |       |             |              |                                             |
|                                                |                   |              |  |       |             |              |                                             |
| Perth Laboratory - NATA # 2377 Site # 2370     |                   |              |  |       |             |              |                                             |
| Melbourne Laboratory - NATA # 1261 Site # 1254 |                   |              |  |       |             |              |                                             |
| Sydney Laboratory - NATA # 1261 Site # 18217   |                   |              |  |       |             |              |                                             |
| Brisbane Laboratory - NATA # 1261 Site # 20794 |                   |              |  |       |             | X            | X                                           |
| Mayfield Laboratory - NATA # 1261 Site # 25079 |                   |              |  |       |             |              |                                             |
| External Laboratory                            |                   |              |  |       |             |              |                                             |
| 13                                             | 0960_QC228_211124 | Nov 24, 2021 |  | Water | L21-No68690 |              | X                                           |
| 14                                             | 0960_QC225_211124 | Nov 24, 2021 |  | Soil  | L21-No69449 | X            | X                                           |
| Test Counts                                    |                   |              |  |       |             | 5            | 14                                          |

## Internal Quality Control Review and Glossary

### General

1. 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.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. 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

**ug/L:** micrograms per litre

**ppm:** Parts per million

**ppb:** Parts per billion

**%:** Percentage

**org/100mL:** Organisms per 100 millilitres

**NTU:** Nephelometric Turbidity Units

**MPN/100mL:** Most Probable Number of organisms per 100 millilitres

### Terms

|                         |                                                                                                                                                                    |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Dry</b>              | Where a moisture has been determined on a solid sample the result is expressed on a dry basis.                                                                     |
| <b>LOR</b>              | Limit of Reporting.                                                                                                                                                |
| <b>SPIKE</b>            | Addition of the analyte to the sample and reported as percentage recovery.                                                                                         |
| <b>RPD</b>              | Relative Percent Difference between two Duplicate pieces of analysis.                                                                                              |
| <b>LCS</b>              | Laboratory Control Sample - reported as percent recovery.                                                                                                          |
| <b>CRM</b>              | Certified Reference Material - reported as percent recovery.                                                                                                       |
| <b>Method Blank</b>     | 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.     |
| <b>Surr - Surrogate</b> | The addition of a like compound to the analyte target and reported as percentage recovery.                                                                         |
| <b>Duplicate</b>        | A second piece of analysis from the same sample and reported in the same units as the result to show comparison.                                                   |
| <b>USEPA</b>            | United States Environmental Protection Agency                                                                                                                      |
| <b>APHA</b>             | American Public Health Association                                                                                                                                 |
| <b>TCLP</b>             | Toxicity Characteristic Leaching Procedure                                                                                                                         |
| <b>COC</b>              | Chain of Custody                                                                                                                                                   |
| <b>SRA</b>              | Sample Receipt Advice                                                                                                                                              |
| <b>QSM</b>              | US Department of Defense Quality Systems Manual Version                                                                                                            |
| <b>CP</b>               | Client Parent - QC was performed on samples pertaining to this report                                                                                              |
| <b>NCP</b>              | 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. |
| <b>TEQ</b>              | Toxic Equivalency Quotient                                                                                                                                         |
| <b>WA DWER</b>          | 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% Phenols & 50-150% PFASs..

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM where no positive PFAS results have been reported have been reviewed and no data was affected.

### QC Data General Comments

1. 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.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

## Quality Control Results

| Test                                                          | Units | Result 1 |  |  | Acceptance Limits | Pass Limits | Qualifying Code |
|---------------------------------------------------------------|-------|----------|--|--|-------------------|-------------|-----------------|
| <b>Method Blank</b>                                           |       |          |  |  |                   |             |                 |
| <b>Perfluoroalkyl carboxylic acids (PFCAs)</b>                |       |          |  |  |                   |             |                 |
| 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        |                 |
| <b>Method Blank</b>                                           |       |          |  |  |                   |             |                 |
| <b>Perfluoroalkyl sulfonamido substances</b>                  |       |          |  |  |                   |             |                 |
| 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        |                 |
| <b>Method Blank</b>                                           |       |          |  |  |                   |             |                 |
| <b>Perfluoroalkyl sulfonic acids (PFSA)s</b>                  |       |          |  |  |                   |             |                 |
| 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        |                 |
| <b>Method Blank</b>                                           |       |          |  |  |                   |             |                 |
| <b>n:2 Fluorotelomer sulfonic acids (n:2 FTSA)s</b>           |       |          |  |  |                   |             |                 |
| 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        |                 |
| <b>LCS - % Recovery</b>                                       |       |          |  |  |                   |             |                 |
| <b>Perfluoroalkyl carboxylic acids (PFCAs)</b>                |       |          |  |  |                   |             |                 |
| Perfluorobutanoic acid (PFBA)                                 | %     | 101      |  |  | 50-150            | Pass        |                 |
| Perfluoropentanoic acid (PFPeA)                               | %     | 99       |  |  | 50-150            | Pass        |                 |
| Perfluorohexanoic acid (PFHxA)                                | %     | 106      |  |  | 50-150            | Pass        |                 |
| Perfluoroheptanoic acid (PFHpA)                               | %     | 98       |  |  | 50-150            | Pass        |                 |
| Perfluorooctanoic acid (PFOA)                                 | %     | 91       |  |  | 50-150            | Pass        |                 |
| Perfluorononanoic acid (PFNA)                                 | %     | 113      |  |  | 50-150            | Pass        |                 |
| Perfluorodecanoic acid (PFDA)                                 | %     | 98       |  |  | 50-150            | Pass        |                 |
| Perfluoroundecanoic acid (PFUnDA)                             | %     | 95       |  |  | 50-150            | Pass        |                 |
| Perfluorododecanoic acid (PFDoDA)                             | %     | 120      |  |  | 50-150            | Pass        |                 |
| Perfluorotridecanoic acid (PFTTrDA)                           | %     | 104      |  |  | 50-150            | Pass        |                 |
| Perfluorotetradecanoic acid (PFTeDA)                          | %     | 114      |  |  | 50-150            | Pass        |                 |



| Test                                                          |               |           | Units | Result 1 |  | Acceptance Limits | Pass Limits | Qualifying Code |
|---------------------------------------------------------------|---------------|-----------|-------|----------|--|-------------------|-------------|-----------------|
| <b>LCS - % Recovery</b>                                       |               |           |       |          |  |                   |             |                 |
| <b>Perfluoroalkyl sulfonamido substances</b>                  |               |           |       |          |  |                   |             |                 |
| Perfluorooctane sulfonamide (FOSA)                            |               |           | %     | 99       |  | 50-150            | Pass        |                 |
| N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)             |               |           | %     | 101      |  | 50-150            | Pass        |                 |
| N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)              |               |           | %     | 127      |  | 50-150            | Pass        |                 |
| 2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) |               |           | %     | 101      |  | 50-150            | Pass        |                 |
| 2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)  |               |           | %     | 83       |  | 50-150            | Pass        |                 |
| N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)     |               |           | %     | 90       |  | 50-150            | Pass        |                 |
| N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)    |               |           | %     | 102      |  | 50-150            | Pass        |                 |
| <b>LCS - % Recovery</b>                                       |               |           |       |          |  |                   |             |                 |
| <b>Perfluoroalkyl sulfonic acids (PFASs)</b>                  |               |           |       |          |  |                   |             |                 |
| Perfluorobutanesulfonic acid (PFBS)                           |               |           | %     | 88       |  | 50-150            | Pass        |                 |
| Perfluorononanesulfonic acid (PFNS)                           |               |           | %     | 96       |  | 50-150            | Pass        |                 |
| Perfluoropropanesulfonic acid (PFPrS)                         |               |           | %     | 103      |  | 50-150            | Pass        |                 |
| Perfluoropentanesulfonic acid (PFPeS)                         |               |           | %     | 83       |  | 50-150            | Pass        |                 |
| Perfluorohexanesulfonic acid (PFHxS)                          |               |           | %     | 85       |  | 50-150            | Pass        |                 |
| Perfluoroheptanesulfonic acid (PFHpS)                         |               |           | %     | 98       |  | 50-150            | Pass        |                 |
| Perfluorooctanesulfonic acid (PFOS)                           |               |           | %     | 99       |  | 50-150            | Pass        |                 |
| Perfluorodecanesulfonic acid (PFDS)                           |               |           | %     | 83       |  | 50-150            | Pass        |                 |
| <b>LCS - % Recovery</b>                                       |               |           |       |          |  |                   |             |                 |
| <b>n:2 Fluorotelomer sulfonic acids (n:2 FTSA)</b>            |               |           |       |          |  |                   |             |                 |
| 1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)           |               |           | %     | 82       |  | 50-150            | Pass        |                 |
| 1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)           |               |           | %     | 104      |  | 50-150            | Pass        |                 |
| 1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)           |               |           | %     | 100      |  | 50-150            | Pass        |                 |
| 1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)        |               |           | %     | 111      |  | 50-150            | Pass        |                 |
| Test                                                          | Lab Sample ID | QA Source | Units | Result 1 |  | Acceptance Limits | Pass Limits | Qualifying Code |
| <b>Spike - % Recovery</b>                                     |               |           |       |          |  |                   |             |                 |
| <b>Perfluoroalkyl carboxylic acids (PFCAs)</b>                |               |           |       |          |  |                   |             |                 |
|                                                               |               |           |       | Result 1 |  |                   |             |                 |
| Perfluorobutanoic acid (PFBA)                                 | B21-No61724   | NCP       | %     | 98       |  | 50-150            | Pass        |                 |
| Perfluoropentanoic acid (PFPeA)                               | B21-No61724   | NCP       | %     | 90       |  | 50-150            | Pass        |                 |
| Perfluorohexanoic acid (PFHxA)                                | B21-No61724   | NCP       | %     | 102      |  | 50-150            | Pass        |                 |
| Perfluoroheptanoic acid (PFHpA)                               | B21-No61724   | NCP       | %     | 99       |  | 50-150            | Pass        |                 |
| Perfluorooctanoic acid (PFOA)                                 | B21-No61724   | NCP       | %     | 94       |  | 50-150            | Pass        |                 |
| Perfluorononanoic acid (PFNA)                                 | B21-No61724   | NCP       | %     | 116      |  | 50-150            | Pass        |                 |
| Perfluorodecanoic acid (PFDA)                                 | B21-No61724   | NCP       | %     | 93       |  | 50-150            | Pass        |                 |
| Perfluoroundecanoic acid (PFUnDA)                             | B21-No61724   | NCP       | %     | 92       |  | 50-150            | Pass        |                 |
| Perfluorododecanoic acid (PFDoDA)                             | B21-No61724   | NCP       | %     | 126      |  | 50-150            | Pass        |                 |
| Perfluorotridecanoic acid (PFTrDA)                            | B21-No61724   | NCP       | %     | 115      |  | 50-150            | Pass        |                 |
| Perfluorotetradecanoic acid (PFTeDA)                          | B21-No61724   | NCP       | %     | 116      |  | 50-150            | Pass        |                 |
| <b>Spike - % Recovery</b>                                     |               |           |       |          |  |                   |             |                 |
| <b>Perfluoroalkyl sulfonamido substances</b>                  |               |           |       |          |  |                   |             |                 |
|                                                               |               |           |       | Result 1 |  |                   |             |                 |
| Perfluorooctane sulfonamide (FOSA)                            | B21-No61724   | NCP       | %     | 98       |  | 50-150            | Pass        |                 |
| N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)             | B21-No61724   | NCP       | %     | 92       |  | 50-150            | Pass        |                 |
| N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)              | B21-No61724   | NCP       | %     | 116      |  | 50-150            | Pass        |                 |
| 2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) | B21-No61724   | NCP       | %     | 120      |  | 50-150            | Pass        |                 |
| 2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)  | B21-No61724   | NCP       | %     | 96       |  | 50-150            | Pass        |                 |

| Test                                                       | Lab Sample ID | QA Source | Units | Result 1 |          |     | Acceptance Limits | Pass Limits | Qualifying Code |
|------------------------------------------------------------|---------------|-----------|-------|----------|----------|-----|-------------------|-------------|-----------------|
| N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)  | B21-No61724   | NCP       | %     | 115      |          |     | 50-150            | Pass        |                 |
| N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) | B21-No61724   | NCP       | %     | 115      |          |     | 50-150            | Pass        |                 |
| <b>Spike - % Recovery</b>                                  |               |           |       |          |          |     |                   |             |                 |
| <b>Perfluoroalkyl sulfonic acids (PFSA's)</b>              |               |           |       | Result 1 |          |     |                   |             |                 |
| Perfluorobutanesulfonic acid (PFBS)                        | B21-No61724   | NCP       | %     | 82       |          |     | 50-150            | Pass        |                 |
| Perfluorononanesulfonic acid (PFNS)                        | B21-No61724   | NCP       | %     | 96       |          |     | 50-150            | Pass        |                 |
| Perfluoropropanesulfonic acid (PFPrS)                      | B21-No61724   | NCP       | %     | 93       |          |     | 50-150            | Pass        |                 |
| Perfluoropentanesulfonic acid (PFPeS)                      | B21-No61724   | NCP       | %     | 92       |          |     | 50-150            | Pass        |                 |
| Perfluorohexanesulfonic acid (PFHxS)                       | B21-No61724   | NCP       | %     | 90       |          |     | 50-150            | Pass        |                 |
| Perfluoroheptanesulfonic acid (PFHpS)                      | B21-No61724   | NCP       | %     | 111      |          |     | 50-150            | Pass        |                 |
| Perfluorooctanesulfonic acid (PFOS)                        | B21-No61724   | NCP       | %     | 105      |          |     | 50-150            | Pass        |                 |
| Perfluorodecanesulfonic acid (PFDS)                        | B21-No61724   | NCP       | %     | 79       |          |     | 50-150            | Pass        |                 |
| <b>Spike - % Recovery</b>                                  |               |           |       |          |          |     |                   |             |                 |
| <b>n:2 Fluorotelomer sulfonic acids (n:2 FTSA's)</b>       |               |           |       | Result 1 |          |     |                   |             |                 |
| 1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)        | B21-No61724   | NCP       | %     | 73       |          |     | 50-150            | Pass        |                 |
| 1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)        | B21-No61724   | NCP       | %     | 69       |          |     | 50-150            | Pass        |                 |
| 1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)        | B21-No61724   | NCP       | %     | 105      |          |     | 50-150            | Pass        |                 |
| 1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)     | B21-No61724   | NCP       | %     | 112      |          |     | 50-150            | Pass        |                 |
| Test                                                       | Lab Sample ID | QA Source | Units | Result 1 |          |     | Acceptance Limits | Pass Limits | Qualifying Code |
| <b>Duplicate</b>                                           |               |           |       |          |          |     |                   |             |                 |
|                                                            |               |           |       | Result 1 | Result 2 | RPD |                   |             |                 |
| % Moisture                                                 | B21-No72256   | NCP       | %     | 52       | 54       | 4.0 | 30%               | Pass        |                 |
| <b>Duplicate</b>                                           |               |           |       |          |          |     |                   |             |                 |
| <b>Perfluoroalkyl carboxylic acids (PFCAs)</b>             |               |           |       | Result 1 | Result 2 | RPD |                   |             |                 |
| Perfluorobutanoic acid (PFBA)                              | L21-No69449   | CP        | ug/kg | < 5      | < 5      | <1  | 30%               | Pass        |                 |
| Perfluoropentanoic acid (PFPeA)                            | L21-No69449   | CP        | ug/kg | < 5      | < 5      | <1  | 30%               | Pass        |                 |
| Perfluorohexanoic acid (PFHxA)                             | L21-No69449   | CP        | ug/kg | < 5      | < 5      | <1  | 30%               | Pass        |                 |
| Perfluoroheptanoic acid (PFHpA)                            | L21-No69449   | CP        | ug/kg | < 5      | < 5      | <1  | 30%               | Pass        |                 |
| Perfluorooctanoic acid (PFOA)                              | L21-No69449   | CP        | ug/kg | < 5      | < 5      | <1  | 30%               | Pass        |                 |
| Perfluorononanoic acid (PFNA)                              | L21-No69449   | CP        | ug/kg | < 5      | < 5      | <1  | 30%               | Pass        |                 |
| Perfluorodecanoic acid (PFDA)                              | L21-No69449   | CP        | ug/kg | < 5      | < 5      | <1  | 30%               | Pass        |                 |
| Perfluoroundecanoic acid (PFUnDA)                          | L21-No69449   | CP        | ug/kg | < 5      | < 5      | <1  | 30%               | Pass        |                 |
| Perfluorododecanoic acid (PFDoDA)                          | L21-No69449   | CP        | ug/kg | < 5      | < 5      | <1  | 30%               | Pass        |                 |
| Perfluorotridecanoic acid (PFTeDA)                         | L21-No69449   | CP        | ug/kg | < 5      | < 5      | <1  | 30%               | Pass        |                 |
| Perfluorotetradecanoic acid (PFTeDA)                       | L21-No69449   | CP        | ug/kg | < 5      | < 5      | <1  | 30%               | Pass        |                 |

| Duplicate                                                     |             |    |       |          |          |     |     |      |
|---------------------------------------------------------------|-------------|----|-------|----------|----------|-----|-----|------|
| Perfluoroalkyl sulfonamido substances                         |             |    |       | Result 1 | Result 2 | RPD |     |      |
| Perfluorooctane sulfonamide (FOSA)                            | L21-No69449 | CP | ug/kg | < 5      | < 5      | <1  | 30% | Pass |
| N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)             | L21-No69449 | CP | ug/kg | < 5      | < 5      | <1  | 30% | Pass |
| N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)              | L21-No69449 | CP | ug/kg | < 5      | < 5      | <1  | 30% | Pass |
| 2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) | L21-No69449 | CP | ug/kg | < 5      | < 5      | <1  | 30% | Pass |
| 2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)  | L21-No69449 | CP | ug/kg | < 5      | < 5      | <1  | 30% | Pass |
| N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)     | L21-No69449 | CP | ug/kg | < 10     | < 10     | <1  | 30% | Pass |
| N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)    | L21-No69449 | CP | ug/kg | < 10     | < 10     | <1  | 30% | Pass |
| Duplicate                                                     |             |    |       |          |          |     |     |      |
| Perfluoroalkyl sulfonic acids (PFSA's)                        |             |    |       | Result 1 | Result 2 | RPD |     |      |
| Perfluorobutanesulfonic acid (PFBS)                           | L21-No69449 | CP | ug/kg | < 5      | < 5      | <1  | 30% | Pass |
| Perfluorononanesulfonic acid (PFNS)                           | L21-No69449 | CP | ug/kg | < 5      | < 5      | <1  | 30% | Pass |
| Perfluoropropanesulfonic acid (PFPrS)                         | L21-No69449 | CP | ug/kg | < 5      | < 5      | <1  | 30% | Pass |
| Perfluoropentanesulfonic acid (PFPeS)                         | L21-No69449 | CP | ug/kg | < 5      | < 5      | <1  | 30% | Pass |
| Perfluorohexanesulfonic acid (PFHxS)                          | L21-No69449 | CP | ug/kg | < 5      | < 5      | <1  | 30% | Pass |
| Perfluoroheptanesulfonic acid (PFHpS)                         | L21-No69449 | CP | ug/kg | < 5      | < 5      | <1  | 30% | Pass |
| Perfluorooctanesulfonic acid (PFOS)                           | L21-No69449 | CP | ug/kg | 6.0      | 5.5      | 9.0 | 30% | Pass |
| Perfluorodecanesulfonic acid (PFDS)                           | L21-No69449 | 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)           | L21-No69449 | CP | ug/kg | < 5      | < 5      | <1  | 30% | Pass |
| 1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)           | L21-No69449 | CP | ug/kg | < 10     | < 10     | <1  | 30% | Pass |
| 1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)           | L21-No69449 | CP | ug/kg | < 5      | < 5      | <1  | 30% | Pass |
| 1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)        | L21-No69449 | 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                                                                                                                                                                                                                                                                                        |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| N09  | Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.                                                                                                                     |
| N11  | Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds. |
| N15  | Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).                             |

### Authorised by:



Analytical Services Manager  
Senior Analyst-PFAS (QLD)




### Business Unit Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

\* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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Cardno Consulting WA  
11 Harvest Terrace  
West Perth  
WA 6005



NATA Accredited  
Accreditation Number 2377  
Site Number 2370

Accredited for compliance with ISO/IEC 17025 – Testing  
NATA is a signatory to the ILAC Mutual Recognition  
Arrangement for the mutual recognition of the  
equivalence of testing, medical testing, calibration,  
inspection, proficiency testing scheme providers and  
reference materials producers reports and certificates.

Attention:

Report **845088-W**  
Project name  
Project ID **960**  
Received Date Nov 26, 2021

| Client Sample ID                                                             |      |      | 0960_QC215_2<br>11124 | 0960_QC216_2<br>11124 | 0960_QC218_2<br>11124 | 0960_QC220_2<br>11124 |
|------------------------------------------------------------------------------|------|------|-----------------------|-----------------------|-----------------------|-----------------------|
| Sample Matrix                                                                |      |      | Water                 | Water                 | Water                 | Water                 |
| Eurofins Sample No.                                                          |      |      | L21-No68678           | L21-No68679           | L21-No68681           | L21-No68683           |
| Date Sampled                                                                 |      |      | Nov 24, 2021          | Nov 24, 2021          | Nov 24, 2021          | Nov 24, 2021          |
| Test/Reference                                                               | LOR  | Unit |                       |                       |                       |                       |
| <b>Perfluoroalkyl carboxylic acids (PFCAs)</b>                               |      |      |                       |                       |                       |                       |
| Perfluorobutanoic acid (PFBA) <sup>N11</sup>                                 | 0.05 | ug/L | 4.1                   | < 0.05                | < 0.05                | < 0.05                |
| Perfluoropentanoic acid (PFPeA) <sup>N11</sup>                               | 0.01 | ug/L | 10                    | 0.03                  | < 0.01                | < 0.01                |
| Perfluorohexanoic acid (PFHxA) <sup>N11</sup>                                | 0.01 | ug/L | 21                    | 0.14                  | < 0.01                | < 0.01                |
| Perfluoroheptanoic acid (PFHpA) <sup>N11</sup>                               | 0.01 | ug/L | <sup>N09</sup> 2.9    | <sup>N09</sup> 0.01   | < 0.01                | < 0.01                |
| Perfluorooctanoic acid (PFOA) <sup>N11</sup>                                 | 0.01 | ug/L | <sup>N09</sup> 4.0    | <sup>N09</sup> 0.01   | < 0.01                | < 0.01                |
| Perfluorononanoic acid (PFNA) <sup>N11</sup>                                 | 0.01 | ug/L | <sup>N09</sup> 0.03   | < 0.01                | < 0.01                | < 0.01                |
| Perfluorodecanoic acid (PFDA) <sup>N11</sup>                                 | 0.01 | ug/L | < 0.01                | < 0.01                | < 0.01                | < 0.01                |
| Perfluoroundecanoic acid (PFUnDA) <sup>N11</sup>                             | 0.01 | ug/L | < 0.01                | < 0.01                | < 0.01                | < 0.01                |
| Perfluorododecanoic acid (PFDoDA) <sup>N11</sup>                             | 0.01 | ug/L | < 0.01                | < 0.01                | < 0.01                | < 0.01                |
| Perfluorotridecanoic acid (PFTrDA) <sup>N15</sup>                            | 0.01 | ug/L | < 0.01                | < 0.01                | < 0.01                | < 0.01                |
| Perfluorotetradecanoic acid (PFTeDA) <sup>N11</sup>                          | 0.01 | ug/L | < 0.01                | < 0.01                | < 0.01                | < 0.01                |
| 13C4-PFBA (surr.)                                                            | 1    | %    | 120                   | 99                    | 95                    | 95                    |
| 13C5-PFPeA (surr.)                                                           | 1    | %    | 79                    | 84                    | 106                   | 89                    |
| 13C5-PFHxA (surr.)                                                           | 1    | %    | 83                    | 79                    | 74                    | 83                    |
| 13C4-PFHpA (surr.)                                                           | 1    | %    | 76                    | 101                   | 91                    | 88                    |
| 13C8-PFOA (surr.)                                                            | 1    | %    | 57                    | 89                    | 71                    | 73                    |
| 13C5-PFNA (surr.)                                                            | 1    | %    | 58                    | 99                    | 78                    | 81                    |
| 13C6-PFDA (surr.)                                                            | 1    | %    | 20                    | 95                    | 88                    | 79                    |
| 13C2-PFUnDA (surr.)                                                          | 1    | %    | 77                    | 109                   | 89                    | 69                    |
| 13C2-PFDoDA (surr.)                                                          | 1    | %    | 88                    | 109                   | 82                    | 50                    |
| 13C2-PFTeDA (surr.)                                                          | 1    | %    | 177                   | INT                   | 182                   | 62                    |
| <b>Perfluoroalkyl sulfonamido substances</b>                                 |      |      |                       |                       |                       |                       |
| Perfluorooctane sulfonamide (FOSA) <sup>N11</sup>                            | 0.05 | ug/L | <sup>N09</sup> 0.06   | < 0.05                | < 0.05                | < 0.05                |
| N-methylperfluoro-1-octane sulfonamide (N-MeFOSA) <sup>N11</sup>             | 0.05 | ug/L | < 0.05                | < 0.05                | < 0.05                | < 0.05                |
| N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA) <sup>N11</sup>              | 0.05 | ug/L | < 0.05                | < 0.05                | < 0.05                | < 0.05                |
| 2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) <sup>N11</sup> | 0.05 | ug/L | < 0.05                | < 0.05                | < 0.05                | < 0.05                |
| 2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE) <sup>N11</sup>  | 0.05 | ug/L | < 0.05                | < 0.05                | < 0.05                | < 0.05                |
| N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA) <sup>N11</sup>     | 0.05 | ug/L | < 0.05                | < 0.05                | < 0.05                | < 0.05                |
| N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) <sup>N11</sup>    | 0.05 | ug/L | < 0.05                | < 0.05                | < 0.05                | < 0.05                |
| 13C8-FOSA (surr.)                                                            | 1    | %    | 114                   | 133                   | 113                   | 108                   |
| D3-N-MeFOSA (surr.)                                                          | 1    | %    | 61                    | 76                    | 51                    | 41                    |

| Client Sample ID                                                      |      |      | 0960_QC215_2<br>11124 | 0960_QC216_2<br>11124 | 0960_QC218_2<br>11124 | 0960_QC220_2<br>11124 |
|-----------------------------------------------------------------------|------|------|-----------------------|-----------------------|-----------------------|-----------------------|
| Sample Matrix                                                         |      |      | Water                 | Water                 | Water                 | Water                 |
| Eurofins Sample No.                                                   |      |      | L21-No68678           | L21-No68679           | L21-No68681           | L21-No68683           |
| Date Sampled                                                          |      |      | Nov 24, 2021          | Nov 24, 2021          | Nov 24, 2021          | Nov 24, 2021          |
| Test/Reference                                                        | LOR  | Unit |                       |                       |                       |                       |
| <b>Perfluoroalkyl sulfonamido substances</b>                          |      |      |                       |                       |                       |                       |
| D5-N-EtFOSA (surr.)                                                   | 1    | %    | 51                    | 57                    | 68                    | 42                    |
| D7-N-MeFOSE (surr.)                                                   | 1    | %    | 75                    | 101                   | 81                    | 75                    |
| D9-N-EtFOSE (surr.)                                                   | 1    | %    | 69                    | 80                    | 119                   | 88                    |
| D5-N-EtFOSAA (surr.)                                                  | 1    | %    | <sup>NO9</sup> 48     | 90                    | 60                    | 52                    |
| D3-N-MeFOSAA (surr.)                                                  | 1    | %    | 45                    | 95                    | 54                    | 58                    |
| <b>Perfluoroalkyl sulfonic acids (PFSA's)</b>                         |      |      |                       |                       |                       |                       |
| Perfluorobutanesulfonic acid (PFBS) <sup>N11</sup>                    | 0.01 | ug/L | 5.1                   | 0.12                  | < 0.01                | < 0.01                |
| Perfluorononanesulfonic acid (PFNS) <sup>N15</sup>                    | 0.01 | ug/L | <sup>NO9</sup> 0.08   | < 0.01                | < 0.01                | < 0.01                |
| Perfluoropropanesulfonic acid (PFPrS) <sup>N15</sup>                  | 0.01 | ug/L | 2.2                   | 0.05                  | < 0.01                | < 0.01                |
| Perfluoropentanesulfonic acid (PFPeS) <sup>N15</sup>                  | 0.01 | ug/L | <sup>NO9</sup> 5.4    | <sup>NO9</sup> 0.19   | < 0.01                | < 0.01                |
| Perfluorohexanesulfonic acid (PFHxS) <sup>N11</sup>                   | 0.01 | ug/L | <sup>NO9</sup> 35     | <sup>NO9</sup> 0.79   | < 0.01                | < 0.01                |
| Perfluoroheptanesulfonic acid (PFHpS) <sup>N15</sup>                  | 0.01 | ug/L | <sup>NO9</sup> 5.2    | <sup>NO9</sup> 0.01   | < 0.01                | < 0.01                |
| Perfluorooctanesulfonic acid (PFOS) <sup>N11</sup>                    | 0.01 | ug/L | <sup>NO9</sup> 53     | <sup>NO9</sup> 0.03   | < 0.01                | < 0.01                |
| Perfluorodecanesulfonic acid (PFDS) <sup>N15</sup>                    | 0.01 | ug/L | < 0.01                | < 0.01                | < 0.01                | < 0.01                |
| 13C3-PFBS (surr.)                                                     | 1    | %    | 102                   | 98                    | 97                    | 110                   |
| 18O2-PFHxS (surr.)                                                    | 1    | %    | 114                   | 70                    | 116                   | 106                   |
| 13C8-PFOS (surr.)                                                     | 1    | %    | 101                   | 104                   | 132                   | 112                   |
| <b>n:2 Fluorotelomer sulfonic acids (n:2 FTSA's)</b>                  |      |      |                       |                       |                       |                       |
| 1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA) <sup>N11</sup>    | 0.01 | ug/L | < 0.01                | < 0.01                | < 0.01                | < 0.01                |
| 1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA) <sup>N11</sup>    | 0.05 | ug/L | 0.10                  | < 0.05                | < 0.05                | < 0.05                |
| 1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA) <sup>N11</sup>    | 0.01 | ug/L | 0.05                  | < 0.01                | < 0.01                | < 0.01                |
| 1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA) <sup>N11</sup> | 0.01 | ug/L | < 0.01                | < 0.01                | < 0.01                | < 0.01                |
| 13C2-4:2 FTSA (surr.)                                                 | 1    | %    | 77                    | 113                   | 66                    | 89                    |
| 13C2-6:2 FTSA (surr.)                                                 | 1    | %    | 69                    | 106                   | 89                    | 104                   |
| 13C2-8:2 FTSA (surr.)                                                 | 1    | %    | 60                    | 101                   | 94                    | 101                   |
| 13C2-10:2 FTSA (surr.)                                                | 1    | %    | 104                   | 122                   | 99                    | 69                    |
| <b>PFASs Summations</b>                                               |      |      |                       |                       |                       |                       |
| Sum (PFHxS + PFOS)*                                                   | 0.01 | ug/L | 88                    | 0.82                  | < 0.01                | < 0.01                |
| Sum of US EPA PFAS (PFOS + PFOA)*                                     | 0.01 | ug/L | 57                    | 0.04                  | < 0.01                | < 0.01                |
| Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*                           | 0.01 | ug/L | 92                    | 0.83                  | < 0.01                | < 0.01                |
| Sum of WA DWER PFAS (n=10)*                                           | 0.05 | ug/L | 135.25                | 1.13                  | < 0.05                | < 0.05                |
| Sum of PFASs (n=30)*                                                  | 0.1  | ug/L | 148.22                | 1.38                  | < 0.1                 | < 0.1                 |

| Client Sample ID                               |      |      | 0960_QC223_2<br>11124 | 0960_QC224_2<br>11124 | 0960_QC226_2<br>11124 | 0960_QC227_2<br>11124 |
|------------------------------------------------|------|------|-----------------------|-----------------------|-----------------------|-----------------------|
| Sample Matrix                                  |      |      | Water                 | Water                 | Water                 | Water                 |
| Eurofins Sample No.                            |      |      | L21-No68686           | L21-No68687           | L21-No68688           | L21-No68689           |
| Date Sampled                                   |      |      | Nov 24, 2021          | Nov 24, 2021          | Nov 24, 2021          | Nov 24, 2021          |
| Test/Reference                                 | LOR  | Unit |                       |                       |                       |                       |
| <b>Perfluoroalkyl carboxylic acids (PFCAs)</b> |      |      |                       |                       |                       |                       |
| Perfluorobutanoic acid (PFBA) <sup>N11</sup>   | 0.05 | ug/L | < 0.05                | 0.07                  | < 0.05                | < 0.05                |
| Perfluoropentanoic acid (PFPeA) <sup>N11</sup> | 0.01 | ug/L | < 0.01                | 0.03                  | < 0.01                | 0.06                  |
| Perfluorohexanoic acid (PFHxA) <sup>N11</sup>  | 0.01 | ug/L | < 0.01                | 0.21                  | < 0.01                | 0.43                  |
| Perfluoroheptanoic acid (PFHpA) <sup>N11</sup> | 0.01 | ug/L | < 0.01                | <sup>NO9</sup> 0.03   | < 0.01                | <sup>NO9</sup> 0.03   |
| Perfluorooctanoic acid (PFOA) <sup>N11</sup>   | 0.01 | ug/L | < 0.01                | <sup>NO9</sup> 0.12   | < 0.01                | <sup>NO9</sup> 0.02   |



| Client Sample ID                                                             |      |      | 0960_QC223_2<br>11124 | 0960_QC224_2<br>11124 | 0960_QC226_2<br>11124 | 0960_QC227_2<br>11124 |
|------------------------------------------------------------------------------|------|------|-----------------------|-----------------------|-----------------------|-----------------------|
| Sample Matrix                                                                |      |      | Water                 | Water                 | Water                 | Water                 |
| Eurofins Sample No.                                                          |      |      | L21-No68686           | L21-No68687           | L21-No68688           | L21-No68689           |
| Date Sampled                                                                 |      |      | Nov 24, 2021          | Nov 24, 2021          | Nov 24, 2021          | Nov 24, 2021          |
| Test/Reference                                                               | LOR  | Unit |                       |                       |                       |                       |
| <b>Perfluoroalkyl carboxylic acids (PFCAs)</b>                               |      |      |                       |                       |                       |                       |
| Perfluorononanoic acid (PFNA) <sup>N11</sup>                                 | 0.01 | ug/L | < 0.01                | < 0.01                | < 0.01                | < 0.01                |
| Perfluorodecanoic acid (PFDA) <sup>N11</sup>                                 | 0.01 | ug/L | < 0.01                | < 0.01                | < 0.01                | < 0.01                |
| Perfluoroundecanoic acid (PFUnDA) <sup>N11</sup>                             | 0.01 | ug/L | < 0.01                | < 0.01                | < 0.01                | < 0.01                |
| Perfluorododecanoic acid (PFDoDA) <sup>N11</sup>                             | 0.01 | ug/L | < 0.01                | < 0.01                | < 0.01                | < 0.01                |
| Perfluorotridecanoic acid (PFTrDA) <sup>N15</sup>                            | 0.01 | ug/L | < 0.01                | < 0.01                | < 0.01                | < 0.01                |
| Perfluorotetradecanoic acid (PFTeDA) <sup>N11</sup>                          | 0.01 | ug/L | < 0.01                | < 0.01                | < 0.01                | < 0.01                |
| 13C4-PFBA (surr.)                                                            | 1    | %    | 88                    | 57                    | 86                    | 88                    |
| 13C5-PFPeA (surr.)                                                           | 1    | %    | 102                   | 64                    | 99                    | 95                    |
| 13C5-PFHxA (surr.)                                                           | 1    | %    | 73                    | 54                    | 70                    | 65                    |
| 13C4-PFHpA (surr.)                                                           | 1    | %    | 83                    | 59                    | 86                    | 76                    |
| 13C8-PFOA (surr.)                                                            | 1    | %    | 68                    | 53                    | 58                    | 60                    |
| 13C5-PFNA (surr.)                                                            | 1    | %    | 70                    | 52                    | 65                    | 70                    |
| 13C6-PFDA (surr.)                                                            | 1    | %    | 65                    | 52                    | 66                    | 76                    |
| 13C2-PFUnDA (surr.)                                                          | 1    | %    | 58                    | 51                    | 62                    | 77                    |
| 13C2-PFDoDA (surr.)                                                          | 1    | %    | 47                    | 36                    | 46                    | 52                    |
| 13C2-PFTeDA (surr.)                                                          | 1    | %    | 83                    | 14                    | 63                    | 87                    |
| <b>Perfluoroalkyl sulfonamido substances</b>                                 |      |      |                       |                       |                       |                       |
| Perfluorooctane sulfonamide (FOSA) <sup>N11</sup>                            | 0.05 | ug/L | < 0.05                | < 0.05                | < 0.05                | < 0.05                |
| N-methylperfluoro-1-octane sulfonamide (N-MeFOSA) <sup>N11</sup>             | 0.05 | ug/L | < 0.05                | < 0.05                | < 0.05                | < 0.05                |
| N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA) <sup>N11</sup>              | 0.05 | ug/L | < 0.05                | < 0.05                | < 0.05                | < 0.05                |
| 2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) <sup>N11</sup> | 0.05 | ug/L | < 0.05                | < 0.05                | < 0.05                | < 0.05                |
| 2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE) <sup>N11</sup>  | 0.05 | ug/L | < 0.05                | < 0.05                | < 0.05                | < 0.05                |
| N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA) <sup>N11</sup>     | 0.05 | ug/L | < 0.05                | < 0.05                | < 0.05                | < 0.05                |
| N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) <sup>N11</sup>    | 0.05 | ug/L | < 0.05                | < 0.05                | < 0.05                | < 0.05                |
| 13C8-FOSA (surr.)                                                            | 1    | %    | 86                    | 81                    | 93                    | 106                   |
| D3-N-MeFOSA (surr.)                                                          | 1    | %    | 32                    | 52                    | 39                    | 53                    |
| D5-N-EtFOSA (surr.)                                                          | 1    | %    | 38                    | 50                    | 40                    | 66                    |
| D7-N-MeFOSE (surr.)                                                          | 1    | %    | 55                    | 69                    | 58                    | 81                    |
| D9-N-EtFOSE (surr.)                                                          | 1    | %    | 90                    | 90                    | 91                    | 136                   |
| D5-N-EtFOSAA (surr.)                                                         | 1    | %    | 58                    | 23                    | 61                    | 29                    |
| D3-N-MeFOSAA (surr.)                                                         | 1    | %    | 57                    | 25                    | 52                    | 29                    |
| <b>Perfluoroalkyl sulfonic acids (PFSA)</b>                                  |      |      |                       |                       |                       |                       |
| Perfluorobutanesulfonic acid (PFBS) <sup>N11</sup>                           | 0.01 | ug/L | < 0.01                | 0.06                  | < 0.01                | 0.11                  |
| Perfluorononanesulfonic acid (PFNS) <sup>N15</sup>                           | 0.01 | ug/L | < 0.01                | < 0.01                | < 0.01                | < 0.01                |
| Perfluoropropanesulfonic acid (PFPrS) <sup>N15</sup>                         | 0.01 | ug/L | < 0.01                | 0.01                  | < 0.01                | 0.04                  |
| Perfluoropentanesulfonic acid (PFPeS) <sup>N15</sup>                         | 0.01 | ug/L | < 0.01                | <sup>N09</sup> 0.06   | < 0.01                | <sup>N09</sup> 0.09   |
| Perfluorohexanesulfonic acid (PFHxS) <sup>N11</sup>                          | 0.01 | ug/L | < 0.01                | <sup>N09</sup> 1.7    | < 0.01                | <sup>N09</sup> 0.89   |
| Perfluoroheptanesulfonic acid (PFHpS) <sup>N15</sup>                         | 0.01 | ug/L | < 0.01                | <sup>N09</sup> 0.19   | < 0.01                | <sup>N09</sup> 0.01   |
| Perfluorooctanesulfonic acid (PFOS) <sup>N11</sup>                           | 0.01 | ug/L | < 0.01                | <sup>N09</sup> 1.7    | < 0.01                | <sup>N09</sup> 0.05   |
| Perfluorodecanesulfonic acid (PFDS) <sup>N15</sup>                           | 0.01 | ug/L | < 0.01                | < 0.01                | < 0.01                | < 0.01                |
| 13C3-PFBS (surr.)                                                            | 1    | %    | 87                    | 88                    | 99                    | 84                    |
| 18O2-PFHxS (surr.)                                                           | 1    | %    | 99                    | 76                    | 98                    | 78                    |
| 13C8-PFOS (surr.)                                                            | 1    | %    | 97                    | 51                    | 89                    | 103                   |

|                                                                       |            |             |                               |                               |                               |                               |
|-----------------------------------------------------------------------|------------|-------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| <b>Client Sample ID</b>                                               |            |             | <b>0960_QC223_2<br/>11124</b> | <b>0960_QC224_2<br/>11124</b> | <b>0960_QC226_2<br/>11124</b> | <b>0960_QC227_2<br/>11124</b> |
| <b>Sample Matrix</b>                                                  |            |             | <b>Water</b>                  | <b>Water</b>                  | <b>Water</b>                  | <b>Water</b>                  |
| <b>Eurofins Sample No.</b>                                            |            |             | <b>L21-No68686</b>            | <b>L21-No68687</b>            | <b>L21-No68688</b>            | <b>L21-No68689</b>            |
| <b>Date Sampled</b>                                                   |            |             | <b>Nov 24, 2021</b>           | <b>Nov 24, 2021</b>           | <b>Nov 24, 2021</b>           | <b>Nov 24, 2021</b>           |
| <b>Test/Reference</b>                                                 | <b>LOR</b> | <b>Unit</b> |                               |                               |                               |                               |
| <b>n:2 Fluorotelomer sulfonic acids (n:2 FTSA)</b>                    |            |             |                               |                               |                               |                               |
| 1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA) <sup>N11</sup>    | 0.01       | ug/L        | < 0.01                        | < 0.01                        | < 0.01                        | < 0.01                        |
| 1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA) <sup>N11</sup>    | 0.05       | ug/L        | < 0.05                        | < 0.05                        | < 0.05                        | < 0.05                        |
| 1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA) <sup>N11</sup>    | 0.01       | ug/L        | < 0.01                        | < 0.01                        | < 0.01                        | < 0.01                        |
| 1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA) <sup>N11</sup> | 0.01       | ug/L        | < 0.01                        | < 0.01                        | < 0.01                        | < 0.01                        |
| 13C2-4:2 FTSA (surr.)                                                 | 1          | %           | 66                            | 52                            | 70                            | 64                            |
| 13C2-6:2 FTSA (surr.)                                                 | 1          | %           | 78                            | 56                            | 73                            | 70                            |
| 13C2-8:2 FTSA (surr.)                                                 | 1          | %           | 81                            | 72                            | 81                            | 94                            |
| 13C2-10:2 FTSA (surr.)                                                | 1          | %           | 63                            | 53                            | 69                            | 69                            |
| <b>PFASs Summations</b>                                               |            |             |                               |                               |                               |                               |
| Sum (PFHxS + PFOS)*                                                   | 0.01       | ug/L        | < 0.01                        | 3.4                           | < 0.01                        | 0.94                          |
| Sum of US EPA PFAS (PFOS + PFOA)*                                     | 0.01       | ug/L        | < 0.01                        | 1.82                          | < 0.01                        | 0.07                          |
| Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*                           | 0.01       | ug/L        | < 0.01                        | 3.52                          | < 0.01                        | 0.96                          |
| Sum of WA DWER PFAS (n=10)*                                           | 0.05       | ug/L        | < 0.05                        | 3.92                          | < 0.05                        | 1.59                          |
| Sum of PFASs (n=30)*                                                  | 0.1        | ug/L        | < 0.1                         | 4.18                          | < 0.1                         | 1.73                          |

|                                                     |            |             |                               |
|-----------------------------------------------------|------------|-------------|-------------------------------|
| <b>Client Sample ID</b>                             |            |             | <b>0960_QC228_2<br/>11124</b> |
| <b>Sample Matrix</b>                                |            |             | <b>Water</b>                  |
| <b>Eurofins Sample No.</b>                          |            |             | <b>L21-No68690</b>            |
| <b>Date Sampled</b>                                 |            |             | <b>Nov 24, 2021</b>           |
| <b>Test/Reference</b>                               | <b>LOR</b> | <b>Unit</b> |                               |
| <b>Perfluoroalkyl carboxylic acids (PFCAs)</b>      |            |             |                               |
| Perfluorobutanoic acid (PFBA) <sup>N11</sup>        | 0.05       | ug/L        | < 0.05                        |
| Perfluoropentanoic acid (PFPeA) <sup>N11</sup>      | 0.01       | ug/L        | < 0.01                        |
| Perfluorohexanoic acid (PFHxA) <sup>N11</sup>       | 0.01       | ug/L        | < 0.01                        |
| Perfluoroheptanoic acid (PFHpA) <sup>N11</sup>      | 0.01       | ug/L        | < 0.01                        |
| Perfluorooctanoic acid (PFOA) <sup>N11</sup>        | 0.01       | ug/L        | < 0.01                        |
| Perfluorononanoic acid (PFNA) <sup>N11</sup>        | 0.01       | ug/L        | < 0.01                        |
| Perfluorodecanoic acid (PFDA) <sup>N11</sup>        | 0.01       | ug/L        | < 0.01                        |
| Perfluoroundecanoic acid (PFUnDA) <sup>N11</sup>    | 0.01       | ug/L        | < 0.01                        |
| Perfluorododecanoic acid (PFDoDA) <sup>N11</sup>    | 0.01       | ug/L        | < 0.01                        |
| Perfluorotridecanoic acid (PFTeDA) <sup>N15</sup>   | 0.01       | ug/L        | < 0.01                        |
| Perfluorotetradecanoic acid (PFTeDA) <sup>N11</sup> | 0.01       | ug/L        | < 0.01                        |
| 13C4-PFBA (surr.)                                   | 1          | %           | 91                            |
| 13C5-PFPeA (surr.)                                  | 1          | %           | 100                           |
| 13C5-PFHxA (surr.)                                  | 1          | %           | 70                            |
| 13C4-PFHpA (surr.)                                  | 1          | %           | 98                            |
| 13C8-PFOA (surr.)                                   | 1          | %           | 70                            |
| 13C5-PFNA (surr.)                                   | 1          | %           | 75                            |
| 13C6-PFDA (surr.)                                   | 1          | %           | 78                            |
| 13C2-PFUnDA (surr.)                                 | 1          | %           | 77                            |
| 13C2-PFDoDA (surr.)                                 | 1          | %           | 53                            |
| 13C2-PFTeDA (surr.)                                 | 1          | %           | 48                            |

|                                                                              |      |      |                               |
|------------------------------------------------------------------------------|------|------|-------------------------------|
| <b>Client Sample ID</b>                                                      |      |      | <b>0960_QC228_2<br/>11124</b> |
| <b>Sample Matrix</b>                                                         |      |      | <b>Water</b>                  |
| <b>Eurofins Sample No.</b>                                                   |      |      | <b>L21-No68690</b>            |
| <b>Date Sampled</b>                                                          |      |      | <b>Nov 24, 2021</b>           |
| Test/Reference                                                               | LOR  | Unit |                               |
| <b>Perfluoroalkyl sulfonamido substances</b>                                 |      |      |                               |
| Perfluorooctane sulfonamide (FOSA) <sup>N11</sup>                            | 0.05 | ug/L | < 0.05                        |
| N-methylperfluoro-1-octane sulfonamide (N-MeFOSA) <sup>N11</sup>             | 0.05 | ug/L | < 0.05                        |
| N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA) <sup>N11</sup>              | 0.05 | ug/L | < 0.05                        |
| 2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) <sup>N11</sup> | 0.05 | ug/L | < 0.05                        |
| 2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE) <sup>N11</sup>  | 0.05 | ug/L | < 0.05                        |
| N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA) <sup>N11</sup>     | 0.05 | ug/L | < 0.05                        |
| N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) <sup>N11</sup>    | 0.05 | ug/L | < 0.05                        |
| 13C8-FOSA (surr.)                                                            | 1    | %    | 103                           |
| D3-N-MeFOSA (surr.)                                                          | 1    | %    | 47                            |
| D5-N-EtFOSA (surr.)                                                          | 1    | %    | 52                            |
| D7-N-MeFOSE (surr.)                                                          | 1    | %    | 90                            |
| D9-N-EtFOSE (surr.)                                                          | 1    | %    | 105                           |
| D5-N-EtFOSAA (surr.)                                                         | 1    | %    | 57                            |
| D3-N-MeFOSAA (surr.)                                                         | 1    | %    | 60                            |
| <b>Perfluoroalkyl sulfonic acids (PFASs)</b>                                 |      |      |                               |
| Perfluorobutanesulfonic acid (PFBS) <sup>N11</sup>                           | 0.01 | ug/L | < 0.01                        |
| Perfluorononanesulfonic acid (PFNS) <sup>N15</sup>                           | 0.01 | ug/L | < 0.01                        |
| Perfluoropropanesulfonic acid (PFPrS) <sup>N15</sup>                         | 0.01 | ug/L | < 0.01                        |
| Perfluoropentanesulfonic acid (PFPeS) <sup>N15</sup>                         | 0.01 | ug/L | < 0.01                        |
| Perfluorohexanesulfonic acid (PFHxS) <sup>N11</sup>                          | 0.01 | ug/L | < 0.01                        |
| Perfluoroheptanesulfonic acid (PFHpS) <sup>N15</sup>                         | 0.01 | ug/L | < 0.01                        |
| Perfluorooctanesulfonic acid (PFOS) <sup>N11</sup>                           | 0.01 | ug/L | < 0.01                        |
| Perfluorodecanesulfonic acid (PFDS) <sup>N15</sup>                           | 0.01 | ug/L | < 0.01                        |
| 13C3-PFBS (surr.)                                                            | 1    | %    | 100                           |
| 18O2-PFHxS (surr.)                                                           | 1    | %    | 98                            |
| 13C8-PFOS (surr.)                                                            | 1    | %    | 99                            |
| <b>n:2 Fluorotelomer sulfonic acids (n:2 FTSA)</b>                           |      |      |                               |
| 1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA) <sup>N11</sup>           | 0.01 | ug/L | < 0.01                        |
| 1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA) <sup>N11</sup>           | 0.05 | ug/L | < 0.05                        |
| 1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA) <sup>N11</sup>           | 0.01 | ug/L | < 0.01                        |
| 1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA) <sup>N11</sup>        | 0.01 | ug/L | < 0.01                        |
| 13C2-4:2 FTSA (surr.)                                                        | 1    | %    | 74                            |
| 13C2-6:2 FTSA (surr.)                                                        | 1    | %    | 92                            |
| 13C2-8:2 FTSA (surr.)                                                        | 1    | %    | 88                            |
| 13C2-10:2 FTSA (surr.)                                                       | 1    | %    | 70                            |
| <b>PFASs Summations</b>                                                      |      |      |                               |
| Sum (PFHxS + PFOS)*                                                          | 0.01 | ug/L | < 0.01                        |
| Sum of US EPA PFAS (PFOS + PFOA)*                                            | 0.01 | ug/L | < 0.01                        |
| Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*                                  | 0.01 | ug/L | < 0.01                        |
| Sum of WA DWER PFAS (n=10)*                                                  | 0.05 | ug/L | < 0.05                        |
| Sum of PFASs (n=30)*                                                         | 0.1  | ug/L | < 0.1                         |

### 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     | Nov 30, 2021 | 28 Days      |
| - Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) |              |              |              |
| Perfluoroalkyl sulfonamido substances                             | Brisbane     | Nov 30, 2021 | 28 Days      |
| - Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) |              |              |              |
| Perfluoroalkyl sulfonic acids (PFSAs)                             | Brisbane     | Nov 30, 2021 | 28 Days      |
| - Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) |              |              |              |
| n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)                      | Brisbane     | Nov 30, 2021 | 28 Days      |
| - Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS) |              |              |              |

|                                                          |                                             |                   |              |                      |                      |
|----------------------------------------------------------|---------------------------------------------|-------------------|--------------|----------------------|----------------------|
| <b>Company Name:</b>                                     | Cardno (WA)                                 | <b>Order No.:</b> | 19009/430    | <b>Received:</b>     | Nov 26, 2021 9:00 AM |
| <b>Address:</b>                                          | 11 Harvest Terrace<br>West Perth<br>WA 6005 | <b>Report #:</b>  | 845088       | <b>Due:</b>          | Dec 3, 2021          |
|                                                          |                                             | <b>Phone:</b>     | 08 9273 3888 | <b>Priority:</b>     | 5 Day                |
|                                                          |                                             | <b>Fax:</b>       | 08 9388 3831 | <b>Contact Name:</b> | ██████████           |
| <b>Project Name:</b>                                     |                                             |                   |              |                      |                      |
| <b>Project ID:</b>                                       | 960                                         |                   |              |                      |                      |
| <b>Eurofins Analytical Services Manager :</b> ██████████ |                                             |                   |              |                      |                      |

| Sample Detail                                  |                   |              |               |        |             | Moisture Set | Per- and Polyfluoroalkyl Substances (PFASs) |
|------------------------------------------------|-------------------|--------------|---------------|--------|-------------|--------------|---------------------------------------------|
| Perth Laboratory - NATA # 2377 Site # 2370     |                   |              |               |        |             |              |                                             |
| Melbourne Laboratory - NATA # 1261 Site # 1254 |                   |              |               |        |             |              |                                             |
| Sydney Laboratory - NATA # 1261 Site # 18217   |                   |              |               |        |             |              |                                             |
| Brisbane Laboratory - NATA # 1261 Site # 20794 |                   |              |               |        |             | X            | X                                           |
| Mayfield Laboratory - NATA # 1261 Site # 25079 |                   |              |               |        |             |              |                                             |
| External Laboratory                            |                   |              |               |        |             |              |                                             |
| No                                             | Sample ID         | Sample Date  | Sampling Time | Matrix | LAB ID      |              |                                             |
| 1                                              | 0960_QC215_211124 | Nov 24, 2021 |               | Water  | L21-No68678 |              | X                                           |
| 2                                              | 0960_QC216_211124 | Nov 24, 2021 |               | Water  | L21-No68679 |              | X                                           |
| 3                                              | 0960_QC217_211124 | Nov 24, 2021 |               | Soil   | L21-No68680 | X            | X                                           |
| 4                                              | 0960_QC218_211124 | Nov 24, 2021 |               | Water  | L21-No68681 |              | X                                           |
| 5                                              | 0960_QC219_211124 | Nov 24, 2021 |               | Soil   | L21-No68682 | X            | X                                           |
| 6                                              | 0960_QC220_       | Nov 24, 2021 |               | Water  | L21-No68683 |              | X                                           |

**Company Name:** Cardno (WA)  
**Address:** 11 Harvest Terrace  
West Perth  
WA 6005

**Project Name:**  
**Project ID:** 960

**Order No.:** 19009/430  
**Report #:** 845088  
**Phone:** 08 9273 3888  
**Fax:** 08 9388 3831

**Received:** Nov 26, 2021 9:00 AM  
**Due:** Dec 3, 2021  
**Priority:** 5 Day  
**Contact Name:** [REDACTED]

Eurofins Analytical Services Manager : [REDACTED]

## Sample Detail

Moisture Set

Per- and Polyfluoroalkyl Substances (PFASs)

Perth Laboratory - NATA # 2377 Site # 2370

Melbourne Laboratory - NATA # 1261 Site # 1254

Sydney Laboratory - NATA # 1261 Site # 18217

Brisbane Laboratory - NATA # 1261 Site # 20794

Mayfield Laboratory - NATA # 1261 Site # 25079

External Laboratory

|    |                   |              |  |       |             |   |   |
|----|-------------------|--------------|--|-------|-------------|---|---|
|    | 211124            |              |  |       |             |   |   |
| 7  | 0960_QC221_211124 | Nov 24, 2021 |  | Soil  | L21-No68684 | x | x |
| 8  | 0960_QC222_211124 | Nov 24, 2021 |  | Soil  | L21-No68685 | x | x |
| 9  | 0960_QC223_211124 | Nov 24, 2021 |  | Water | L21-No68686 |   | x |
| 10 | 0960_QC224_211124 | Nov 24, 2021 |  | Water | L21-No68687 |   | x |
| 11 | 0960_QC226_211124 | Nov 24, 2021 |  | Water | L21-No68688 |   | x |
| 12 | 0960_QC227_211124 | Nov 24, 2021 |  | Water | L21-No68689 |   | x |



**Company Name:** Cardno (WA)  
**Address:** 11 Harvest Terrace  
West Perth  
WA 6005

**Project Name:**  
**Project ID:** 960

**Order No.:** 19009/430  
**Report #:** 845088  
**Phone:** 08 9273 3888  
**Fax:** 08 9388 3831

**Received:** Nov 26, 2021 9:00 AM  
**Due:** Dec 3, 2021  
**Priority:** 5 Day  
**Contact Name:** [REDACTED]

**Eurofins Analytical Services Manager :** [REDACTED]

| Sample Detail                                  |                   |              |  |       |             | Moisture Set | Per- and Polyfluoroalkyl Substances (PFASs) |
|------------------------------------------------|-------------------|--------------|--|-------|-------------|--------------|---------------------------------------------|
| Perth Laboratory - NATA # 2377 Site # 2370     |                   |              |  |       |             |              |                                             |
| Melbourne Laboratory - NATA # 1261 Site # 1254 |                   |              |  |       |             |              |                                             |
| Sydney Laboratory - NATA # 1261 Site # 18217   |                   |              |  |       |             |              |                                             |
| Brisbane Laboratory - NATA # 1261 Site # 20794 |                   |              |  |       |             | X            | X                                           |
| Mayfield Laboratory - NATA # 1261 Site # 25079 |                   |              |  |       |             |              |                                             |
| External Laboratory                            |                   |              |  |       |             |              |                                             |
| 13                                             | 0960_QC228_211124 | Nov 24, 2021 |  | Water | L21-No68690 |              | X                                           |
| 14                                             | 0960_QC225_211124 | Nov 24, 2021 |  | Soil  | L21-No69449 | X            | X                                           |
| Test Counts                                    |                   |              |  |       |             | 5            | 14                                          |

## Internal Quality Control Review and Glossary

### General

1. 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.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. 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

**ug/L:** micrograms per litre

**ppm:** Parts per million

**ppb:** Parts per billion

**%:** Percentage

**org/100mL:** Organisms per 100 millilitres

**NTU:** Nephelometric Turbidity Units

**MPN/100mL:** Most Probable Number of organisms per 100 millilitres

### Terms

|                         |                                                                                                                                                                    |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Dry</b>              | Where a moisture has been determined on a solid sample the result is expressed on a dry basis.                                                                     |
| <b>LOR</b>              | Limit of Reporting.                                                                                                                                                |
| <b>SPIKE</b>            | Addition of the analyte to the sample and reported as percentage recovery.                                                                                         |
| <b>RPD</b>              | Relative Percent Difference between two Duplicate pieces of analysis.                                                                                              |
| <b>LCS</b>              | Laboratory Control Sample - reported as percent recovery.                                                                                                          |
| <b>CRM</b>              | Certified Reference Material - reported as percent recovery.                                                                                                       |
| <b>Method Blank</b>     | 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.     |
| <b>Surr - Surrogate</b> | The addition of a like compound to the analyte target and reported as percentage recovery.                                                                         |
| <b>Duplicate</b>        | A second piece of analysis from the same sample and reported in the same units as the result to show comparison.                                                   |
| <b>USEPA</b>            | United States Environmental Protection Agency                                                                                                                      |
| <b>APHA</b>             | American Public Health Association                                                                                                                                 |
| <b>TCLP</b>             | Toxicity Characteristic Leaching Procedure                                                                                                                         |
| <b>COC</b>              | Chain of Custody                                                                                                                                                   |
| <b>SRA</b>              | Sample Receipt Advice                                                                                                                                              |
| <b>QSM</b>              | US Department of Defense Quality Systems Manual Version                                                                                                            |
| <b>CP</b>               | Client Parent - QC was performed on samples pertaining to this report                                                                                              |
| <b>NCP</b>              | 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. |
| <b>TEQ</b>              | Toxic Equivalency Quotient                                                                                                                                         |
| <b>WA DWER</b>          | 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% Phenols & 50-150% PFASs..

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM where no positive PFAS results have been reported have been reviewed and no data was affected.

### QC Data General Comments

1. 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.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

## Quality Control Results

| Test                                                          | Units | Result 1 |  |  | Acceptance Limits | Pass Limits | Qualifying Code |
|---------------------------------------------------------------|-------|----------|--|--|-------------------|-------------|-----------------|
| <b>Method Blank</b>                                           |       |          |  |  |                   |             |                 |
| <b>Perfluoroalkyl carboxylic acids (PFCAs)</b>                |       |          |  |  |                   |             |                 |
| 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        |                 |
| <b>Method Blank</b>                                           |       |          |  |  |                   |             |                 |
| <b>Perfluoroalkyl sulfonamido substances</b>                  |       |          |  |  |                   |             |                 |
| 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        |                 |
| <b>Method Blank</b>                                           |       |          |  |  |                   |             |                 |
| <b>Perfluoroalkyl sulfonic acids (PFSAAs)</b>                 |       |          |  |  |                   |             |                 |
| 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        |                 |
| <b>Method Blank</b>                                           |       |          |  |  |                   |             |                 |
| <b>n:2 Fluorotelomer sulfonic acids (n:2 FTSAAs)</b>          |       |          |  |  |                   |             |                 |
| 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        |                 |
| <b>LCS - % Recovery</b>                                       |       |          |  |  |                   |             |                 |
| <b>Perfluoroalkyl carboxylic acids (PFCAs)</b>                |       |          |  |  |                   |             |                 |
| Perfluorobutanoic acid (PFBA)                                 | %     | 102      |  |  | 50-150            | Pass        |                 |
| Perfluoropentanoic acid (PFPeA)                               | %     | 103      |  |  | 50-150            | Pass        |                 |
| Perfluorohexanoic acid (PFHxA)                                | %     | 148      |  |  | 50-150            | Pass        |                 |
| Perfluoroheptanoic acid (PFHpA)                               | %     | 94       |  |  | 50-150            | Pass        |                 |
| Perfluorooctanoic acid (PFOA)                                 | %     | 113      |  |  | 50-150            | Pass        |                 |
| Perfluorononanoic acid (PFNA)                                 | %     | 119      |  |  | 50-150            | Pass        |                 |
| Perfluorodecanoic acid (PFDA)                                 | %     | 104      |  |  | 50-150            | Pass        |                 |
| Perfluoroundecanoic acid (PFUnDA)                             | %     | 112      |  |  | 50-150            | Pass        |                 |
| Perfluorododecanoic acid (PFDoDA)                             | %     | 102      |  |  | 50-150            | Pass        |                 |
| Perfluorotridecanoic acid (PFTTrDA)                           | %     | 126      |  |  | 50-150            | Pass        |                 |
| Perfluorotetradecanoic acid (PFTeDA)                          | %     | 91       |  |  | 50-150            | Pass        |                 |

| Test                                                          |               |           | Units | Result 1 |  | Acceptance Limits | Pass Limits | Qualifying Code |
|---------------------------------------------------------------|---------------|-----------|-------|----------|--|-------------------|-------------|-----------------|
| <b>LCS - % Recovery</b>                                       |               |           |       |          |  |                   |             |                 |
| <b>Perfluoroalkyl sulfonamido substances</b>                  |               |           |       |          |  |                   |             |                 |
| Perfluorooctane sulfonamide (FOSA)                            |               |           | %     | 63       |  | 50-150            | Pass        |                 |
| N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)             |               |           | %     | 104      |  | 50-150            | Pass        |                 |
| N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)              |               |           | %     | 65       |  | 50-150            | Pass        |                 |
| 2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) |               |           | %     | 109      |  | 50-150            | Pass        |                 |
| 2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)  |               |           | %     | 100      |  | 50-150            | Pass        |                 |
| N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)     |               |           | %     | 123      |  | 50-150            | Pass        |                 |
| N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)    |               |           | %     | 109      |  | 50-150            | Pass        |                 |
| <b>LCS - % Recovery</b>                                       |               |           |       |          |  |                   |             |                 |
| <b>Perfluoroalkyl sulfonic acids (PFASs)</b>                  |               |           |       |          |  |                   |             |                 |
| Perfluorobutanesulfonic acid (PFBS)                           |               |           | %     | 116      |  | 50-150            | Pass        |                 |
| Perfluorononanesulfonic acid (PFNS)                           |               |           | %     | 77       |  | 50-150            | Pass        |                 |
| Perfluoropropanesulfonic acid (PFPrS)                         |               |           | %     | 97       |  | 50-150            | Pass        |                 |
| Perfluoropentanesulfonic acid (PFPeS)                         |               |           | %     | 87       |  | 50-150            | Pass        |                 |
| Perfluorohexanesulfonic acid (PFHxS)                          |               |           | %     | 106      |  | 50-150            | Pass        |                 |
| Perfluoroheptanesulfonic acid (PFHpS)                         |               |           | %     | 123      |  | 50-150            | Pass        |                 |
| Perfluorooctanesulfonic acid (PFOS)                           |               |           | %     | 74       |  | 50-150            | Pass        |                 |
| Perfluorodecanesulfonic acid (PFDS)                           |               |           | %     | 70       |  | 50-150            | Pass        |                 |
| <b>LCS - % Recovery</b>                                       |               |           |       |          |  |                   |             |                 |
| <b>n:2 Fluorotelomer sulfonic acids (n:2 FTSA)</b>            |               |           |       |          |  |                   |             |                 |
| 1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)           |               |           | %     | 143      |  | 50-150            | Pass        |                 |
| 1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)           |               |           | %     | 121      |  | 50-150            | Pass        |                 |
| 1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)           |               |           | %     | 83       |  | 50-150            | Pass        |                 |
| 1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)        |               |           | %     | 134      |  | 50-150            | Pass        |                 |
| Test                                                          | Lab Sample ID | QA Source | Units | Result 1 |  | Acceptance Limits | Pass Limits | Qualifying Code |
| <b>Spike - % Recovery</b>                                     |               |           |       |          |  |                   |             |                 |
| <b>Perfluoroalkyl carboxylic acids (PFCAs)</b>                |               |           |       |          |  |                   |             |                 |
|                                                               |               |           |       | Result 1 |  |                   |             |                 |
| Perfluorobutanoic acid (PFBA)                                 | L21-No68679   | CP        | %     | 125      |  | 50-150            | Pass        |                 |
| Perfluoropentanoic acid (PFPeA)                               | L21-No68679   | CP        | %     | 120      |  | 50-150            | Pass        |                 |
| Perfluorohexanoic acid (PFHxA)                                | L21-No68679   | CP        | %     | 69       |  | 50-150            | Pass        |                 |
| Perfluoroheptanoic acid (PFHpA)                               | L21-No68679   | CP        | %     | 117      |  | 50-150            | Pass        |                 |
| Perfluorooctanoic acid (PFOA)                                 | L21-No68679   | CP        | %     | 133      |  | 50-150            | Pass        |                 |
| Perfluorononanoic acid (PFNA)                                 | L21-No68679   | CP        | %     | 135      |  | 50-150            | Pass        |                 |
| Perfluorodecanoic acid (PFDA)                                 | L21-No68679   | CP        | %     | 128      |  | 50-150            | Pass        |                 |
| Perfluoroundecanoic acid (PFUnDA)                             | L21-No68679   | CP        | %     | 127      |  | 50-150            | Pass        |                 |
| Perfluorododecanoic acid (PFDoDA)                             | L21-No68679   | CP        | %     | 119      |  | 50-150            | Pass        |                 |
| Perfluorotridecanoic acid (PFTrDA)                            | L21-No68679   | CP        | %     | 78       |  | 50-150            | Pass        |                 |
| Perfluorotetradecanoic acid (PFTeDA)                          | L21-No68679   | CP        | %     | 123      |  | 50-150            | Pass        |                 |
| <b>Spike - % Recovery</b>                                     |               |           |       |          |  |                   |             |                 |
| <b>Perfluoroalkyl sulfonamido substances</b>                  |               |           |       |          |  |                   |             |                 |
|                                                               |               |           |       | Result 1 |  |                   |             |                 |
| Perfluorooctane sulfonamide (FOSA)                            | L21-No68679   | CP        | %     | 121      |  | 50-150            | Pass        |                 |
| N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)             | L21-No68679   | CP        | %     | 104      |  | 50-150            | Pass        |                 |
| N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)              | L21-No68679   | CP        | %     | 118      |  | 50-150            | Pass        |                 |
| 2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) | L21-No68679   | CP        | %     | 117      |  | 50-150            | Pass        |                 |
| 2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)  | L21-No68679   | CP        | %     | 117      |  | 50-150            | Pass        |                 |

| Test                                                       | Lab Sample ID | QA Source | Units | Result 1 |          |     | Acceptance Limits | Pass Limits | Qualifying Code |
|------------------------------------------------------------|---------------|-----------|-------|----------|----------|-----|-------------------|-------------|-----------------|
| N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)  | L21-No68679   | CP        | %     | 99       |          |     | 50-150            | Pass        |                 |
| N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) | L21-No68679   | CP        | %     | 129      |          |     | 50-150            | Pass        |                 |
| <b>Spike - % Recovery</b>                                  |               |           |       |          |          |     |                   |             |                 |
| <b>Perfluoroalkyl sulfonic acids (PFSA's)</b>              |               |           |       | Result 1 |          |     |                   |             |                 |
| Perfluorobutanesulfonic acid (PFBS)                        | L21-No68679   | CP        | %     | 113      |          |     | 50-150            | Pass        |                 |
| Perfluorononanesulfonic acid (PFNS)                        | L21-No68679   | CP        | %     | 84       |          |     | 50-150            | Pass        |                 |
| Perfluoropropanesulfonic acid (PFPrS)                      | L21-No68679   | CP        | %     | 129      |          |     | 50-150            | Pass        |                 |
| Perfluoropentanesulfonic acid (PFPeS)                      | L21-No68679   | CP        | %     | 133      |          |     | 50-150            | Pass        |                 |
| Perfluorohexanesulfonic acid (PFHxS)                       | L21-No68679   | CP        | %     | 99       |          |     | 50-150            | Pass        |                 |
| Perfluoroheptanesulfonic acid (PFHpS)                      | L21-No68679   | CP        | %     | 129      |          |     | 50-150            | Pass        |                 |
| Perfluorooctanesulfonic acid (PFOS)                        | L21-No68679   | CP        | %     | 107      |          |     | 50-150            | Pass        |                 |
| Perfluorodecanesulfonic acid (PFDS)                        | L21-No68679   | CP        | %     | 109      |          |     | 50-150            | Pass        |                 |
| <b>Spike - % Recovery</b>                                  |               |           |       |          |          |     |                   |             |                 |
| <b>n:2 Fluorotelomer sulfonic acids (n:2 FTSA's)</b>       |               |           |       | Result 1 |          |     |                   |             |                 |
| 1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)        | L21-No68679   | CP        | %     | 122      |          |     | 50-150            | Pass        |                 |
| 1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)        | L21-No68679   | CP        | %     | 100      |          |     | 50-150            | Pass        |                 |
| 1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)        | L21-No68679   | CP        | %     | 96       |          |     | 50-150            | Pass        |                 |
| 1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)     | L21-No68679   | CP        | %     | 104      |          |     | 50-150            | Pass        |                 |
| Test                                                       | Lab Sample ID | QA Source | Units | Result 1 |          |     | Acceptance Limits | Pass Limits | Qualifying Code |
| <b>Duplicate</b>                                           |               |           |       |          |          |     |                   |             |                 |
| <b>Perfluoroalkyl carboxylic acids (PFCAs)</b>             |               |           |       | Result 1 | Result 2 | RPD |                   |             |                 |
| Perfluorobutanoic acid (PFBA)                              | L21-No68678   | CP        | ug/L  | 4.1      | 4.2      | 4.0 | 30%               | Pass        |                 |
| Perfluoropentanoic acid (PFPeA)                            | L21-No68678   | CP        | ug/L  | 10       | 9.8      | 7.0 | 30%               | Pass        |                 |
| Perfluorohexanoic acid (PFHxA)                             | L21-No68678   | CP        | ug/L  | 21       | 23       | 7.0 | 30%               | Pass        |                 |
| Perfluoroheptanoic acid (PFHpA)                            | L21-No68678   | CP        | ug/L  | 2.9      | 3.1      | 5.0 | 30%               | Pass        |                 |
| Perfluorooctanoic acid (PFOA)                              | L21-No68678   | CP        | ug/L  | 4.0      | 3.6      | 10  | 30%               | Pass        |                 |
| Perfluorononanoic acid (PFNA)                              | L21-No68678   | CP        | ug/L  | 0.03     | 0.04     | 17  | 30%               | Pass        |                 |
| Perfluorodecanoic acid (PFDA)                              | L21-No68678   | CP        | ug/L  | < 0.01   | < 0.01   | <1  | 30%               | Pass        |                 |
| Perfluoroundecanoic acid (PFUnDA)                          | L21-No68678   | CP        | ug/L  | < 0.01   | < 0.01   | <1  | 30%               | Pass        |                 |
| Perfluorododecanoic acid (PFDoDA)                          | L21-No68678   | CP        | ug/L  | < 0.01   | < 0.01   | <1  | 30%               | Pass        |                 |
| Perfluorotridecanoic acid (PFTrDA)                         | L21-No68678   | CP        | ug/L  | < 0.01   | < 0.01   | <1  | 30%               | Pass        |                 |
| Perfluorotetradecanoic acid (PFTeDA)                       | L21-No68678   | CP        | ug/L  | < 0.01   | < 0.01   | <1  | 30%               | Pass        |                 |

| Duplicate                                                     |             |    |      |          |          |     |     |      |
|---------------------------------------------------------------|-------------|----|------|----------|----------|-----|-----|------|
| Perfluoroalkyl sulfonamido substances                         |             |    |      | Result 1 | Result 2 | RPD |     |      |
| Perfluorooctane sulfonamide (FOSA)                            | L21-No68678 | CP | ug/L | 0.06     | 0.07     | 9.0 | 30% | Pass |
| N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)             | L21-No68678 | CP | ug/L | < 0.05   | < 0.05   | <1  | 30% | Pass |
| N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)              | L21-No68678 | CP | ug/L | < 0.05   | < 0.05   | <1  | 30% | Pass |
| 2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) | L21-No68678 | CP | ug/L | < 0.05   | < 0.05   | <1  | 30% | Pass |
| 2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)  | L21-No68678 | CP | ug/L | < 0.05   | < 0.05   | <1  | 30% | Pass |
| N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)     | L21-No68678 | CP | ug/L | < 0.05   | < 0.05   | <1  | 30% | Pass |
| N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)    | L21-No68678 | CP | ug/L | < 0.05   | < 0.05   | <1  | 30% | Pass |
| Duplicate                                                     |             |    |      |          |          |     |     |      |
| Perfluoroalkyl sulfonic acids (PFASs)                         |             |    |      | Result 1 | Result 2 | RPD |     |      |
| Perfluorobutanesulfonic acid (PFBS)                           | L21-No68678 | CP | ug/L | 5.1      | 5.5      | 9.0 | 30% | Pass |
| Perfluorononanesulfonic acid (PFNS)                           | L21-No68678 | CP | ug/L | 0.08     | 0.08     | 1.0 | 30% | Pass |
| Perfluoropropanesulfonic acid (PFPrS)                         | L21-No68678 | CP | ug/L | 2.2      | 2.1      | 4.0 | 30% | Pass |
| Perfluoropentanesulfonic acid (PFPeS)                         | L21-No68678 | CP | ug/L | 5.4      | 5.5      | 2.0 | 30% | Pass |
| Perfluorohexanesulfonic acid (PFHxS)                          | L21-No68678 | CP | ug/L | 35       | 31       | 12  | 30% | Pass |
| Perfluoroheptanesulfonic acid (PFHpS)                         | L21-No68678 | CP | ug/L | 5.2      | 4.6      | 11  | 30% | Pass |
| Perfluorooctanesulfonic acid (PFOS)                           | L21-No68678 | CP | ug/L | 53       | 48       | 10  | 30% | Pass |
| Perfluorodecanesulfonic acid (PFDS)                           | L21-No68678 | 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)           | L21-No68678 | CP | ug/L | < 0.01   | < 0.01   | <1  | 30% | Pass |
| 1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)           | L21-No68678 | CP | ug/L | 0.10     | 0.10     | 3.0 | 30% | Pass |
| 1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)           | L21-No68678 | CP | ug/L | 0.05     | 0.05     | 5.0 | 30% | Pass |
| 1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)        | L21-No68678 | CP | ug/L | < 0.01   | < 0.01   | <1  | 30% | Pass |
| Duplicate                                                     |             |    |      |          |          |     |     |      |
| Perfluoroalkyl carboxylic acids (PFCAs)                       |             |    |      | Result 1 | Result 2 | RPD |     |      |
| Perfluorobutanoic acid (PFBA)                                 | L21-No68679 | CP | ug/L | < 0.05   | < 0.05   | <1  | 30% | Pass |
| Perfluoropentanoic acid (PFPeA)                               | L21-No68679 | CP | ug/L | 0.03     | 0.03     | 9.0 | 30% | Pass |
| Perfluorohexanoic acid (PFHxA)                                | L21-No68679 | CP | ug/L | 0.14     | 0.12     | 13  | 30% | Pass |
| Perfluoroheptanoic acid (PFHpA)                               | L21-No68679 | CP | ug/L | 0.01     | 0.01     | 2.0 | 30% | Pass |
| Perfluorooctanoic acid (PFOA)                                 | L21-No68679 | CP | ug/L | 0.01     | 0.01     | 2.0 | 30% | Pass |
| Perfluorononanoic acid (PFNA)                                 | L21-No68679 | CP | ug/L | < 0.01   | < 0.01   | <1  | 30% | Pass |
| Perfluorodecanoic acid (PFDA)                                 | L21-No68679 | CP | ug/L | < 0.01   | < 0.01   | <1  | 30% | Pass |
| Perfluoroundecanoic acid (PFUnDA)                             | L21-No68679 | CP | ug/L | < 0.01   | < 0.01   | <1  | 30% | Pass |
| Perfluorododecanoic acid (PFDoDA)                             | L21-No68679 | CP | ug/L | < 0.01   | < 0.01   | <1  | 30% | Pass |
| Perfluorotridecanoic acid (PFTrDA)                            | L21-No68679 | CP | ug/L | < 0.01   | < 0.01   | <1  | 30% | Pass |
| Perfluorotetradecanoic acid (PFTeDA)                          | L21-No68679 | CP | ug/L | < 0.01   | < 0.01   | <1  | 30% | Pass |



| Duplicate                                                     |             |    |      |          |          |     |     |      |
|---------------------------------------------------------------|-------------|----|------|----------|----------|-----|-----|------|
| Perfluoroalkyl sulfonamido substances                         |             |    |      | Result 1 | Result 2 | RPD |     |      |
| Perfluorooctane sulfonamide (FOSA)                            | L21-No68679 | CP | ug/L | < 0.05   | < 0.05   | <1  | 30% | Pass |
| N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)             | L21-No68679 | CP | ug/L | < 0.05   | < 0.05   | <1  | 30% | Pass |
| N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)              | L21-No68679 | CP | ug/L | < 0.05   | < 0.05   | <1  | 30% | Pass |
| 2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) | L21-No68679 | CP | ug/L | < 0.05   | < 0.05   | <1  | 30% | Pass |
| 2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)  | L21-No68679 | CP | ug/L | < 0.05   | < 0.05   | <1  | 30% | Pass |
| N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)     | L21-No68679 | CP | ug/L | < 0.05   | < 0.05   | <1  | 30% | Pass |
| N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)    | L21-No68679 | CP | ug/L | < 0.05   | < 0.05   | <1  | 30% | Pass |
| Duplicate                                                     |             |    |      |          |          |     |     |      |
| Perfluoroalkyl sulfonic acids (PFSAs)                         |             |    |      | Result 1 | Result 2 | RPD |     |      |
| Perfluorobutanesulfonic acid (PFBS)                           | L21-No68679 | CP | ug/L | 0.12     | 0.13     | 6.0 | 30% | Pass |
| Perfluorononanesulfonic acid (PFNS)                           | L21-No68679 | CP | ug/L | < 0.01   | < 0.01   | <1  | 30% | Pass |
| Perfluoropropanesulfonic acid (PFPrS)                         | L21-No68679 | CP | ug/L | 0.05     | 0.05     | 5.0 | 30% | Pass |
| Perfluoropentanesulfonic acid (PFPeS)                         | L21-No68679 | CP | ug/L | 0.19     | 0.21     | 9.0 | 30% | Pass |
| Perfluorohexanesulfonic acid (PFHxS)                          | L21-No68679 | CP | ug/L | 0.79     | 0.83     | 5.0 | 30% | Pass |
| Perfluoroheptanesulfonic acid (PFHpS)                         | L21-No68679 | CP | ug/L | 0.01     | 0.01     | 6.0 | 30% | Pass |
| Perfluorooctanesulfonic acid (PFOS)                           | L21-No68679 | CP | ug/L | 0.03     | 0.03     | 6.0 | 30% | Pass |
| Perfluorodecanesulfonic acid (PFDS)                           | L21-No68679 | 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)           | L21-No68679 | CP | ug/L | < 0.01   | < 0.01   | <1  | 30% | Pass |
| 1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)           | L21-No68679 | CP | ug/L | < 0.05   | < 0.05   | <1  | 30% | Pass |
| 1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)           | L21-No68679 | CP | ug/L | < 0.01   | < 0.01   | <1  | 30% | Pass |
| 1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)        | L21-No68679 | CP | ug/L | < 0.01   | < 0.01   | <1  | 30% | Pass |

## Comments

### Sample Integrity

|                                                                         |     |
|-------------------------------------------------------------------------|-----|
| Custody Seals Intact (if used)                                          | N/A |
| Attempt to Chill was evident                                            | Yes |
| Sample correctly preserved                                              | Yes |
| Appropriate sample containers have been used                            | Yes |
| Sample containers for volatile analysis received with minimal headspace | N/A |
| Samples received within HoldingTime                                     | Yes |
| Some samples have been subcontracted                                    | No  |

### Qualifier Codes/Comments

| Code | Description                                                                                                                                                                                                                                                                                        |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| N09  | Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.                                                                                                                     |
| N11  | Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds. |
| N15  | Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).                             |

### Authorised by:



Analytical Services Manager  
Senior Analyst-PFAS (QLD)




### Business Unit Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

\* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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# APPENDIX

# D

FIELD RECORDS & CALIBRATION CERTIFICATES



Table D1 Groundwater and Seepage Water Field Records

| Monitoring      |          | Sample_ID                 | Screen Interval | TOC (mAHD) | Well Depth (m) | SWL (mbTOC) | RWL (mAHD) | Other Observations on Bore/Site                                  | Sampling Method          | Temp (oC) | DO (mg/L) | EC (us/Cm) | TDS (mg/L) | pH   | Eh (mV) | QC Dup Sample |                      |
|-----------------|----------|---------------------------|-----------------|------------|----------------|-------------|------------|------------------------------------------------------------------|--------------------------|-----------|-----------|------------|------------|------|---------|---------------|----------------------|
| Monitoring Date | Location |                           |                 |            |                |             |            |                                                                  |                          |           |           |            |            |      |         | #             | Colour               |
| 24/11/2021      | MW016    |                           |                 |            |                |             |            | Bore filled in with soil/no gatic lid present - unable to sample |                          |           |           |            |            |      |         |               |                      |
| 25/11/2021      | MW018    | 0960_MW018_211125         | 5.5-8.5_        | 6.403      | 8.5            |             | 5.567      | 0.836                                                            | Hydrasleeve              | 30        | 2.42      | 3195       | 2077       | 7.9  | -47.9   |               |                      |
| 24/11/2021      | MW021    | 0960_MW021_211124         | 5.6-8.6_        | 6.745      | 8.6            |             | 5.767      | 0.978                                                            | Hydrasleeve              | 31.5      | 3.2       | 3887       | 2528.5     | 8.01 | 104     |               | Brown                |
| 25/11/2021      | MW102    | 0960_MW102_211125         | 2.5-8.5_        | 4.6266     | 8.5            |             | 4.49       | 0.1366                                                           | Hydrasleeve              | 28.4      | 0.72      | 89930      | 58500      | 7.02 | 137     |               | Clear                |
| 25/11/2021      | MW103    | 0960_MW103_211125         | 1-5.8_          | 2.2785     | 5.8            |             | 2.335      | -0.0565                                                          | Hydrasleeve              | 29.4      | 3.42      | 76112      | 49504      | 7.2  | -21.8   |               |                      |
| 25/11/2021      | MW104    | 0960_MW104_211125         | 1-6.5_          | 2.7256     | 6.5            |             | 2.59       | 0.1356                                                           | Hydrasleeve              | 29.2      | 2.18      | 82320      | 53512      | 7.19 | 37.3    |               |                      |
| 24/11/2021      | MW105    | 0960_MW105_211124         | 2-8_            | 3.7272     | 8              |             | 3.24       | 0.4872                                                           | Hydrasleeve              | 27.8      | 1.11      | 45186      | 29367      | 6.91 | 106.3   | 116/216       | Cloudy,Brown         |
| 25/11/2021      | MW112    | 0960_MW112_211125         | 3-8_            | 5.1191     | 8              |             | 4.316      | 0.8031                                                           | Hydrasleeve              | 29.2      | 2.85      | 12869      | 8359       | 7.2  | 125.9   |               | Clear                |
| 24/11/2021      | MW113    | 0960_MW113_211124         | 4-10_           | 7.3165     | 10             |             | 6.351      | 0.9655                                                           | Hydrasleeve              | 30.5      | 2.55      | 10462      | 6799       | 6.99 | 123.8   |               | Clear                |
| 24/11/2021      | MW114    | 0960_MW114_211124         | 4-10_           | 7.7467     | 10             |             | 6.542      | 1.2047                                                           | Hydrasleeve              | 29.4      | 2.16      | 8863       | 5759       | 7.19 | 114.1   |               | Clear,Cloudy         |
| 25/11/2021      | MW115    | 0960_MW115_211125         | 3-8_            | 4.9133     | 8              |             | 4.227      | 0.6863                                                           | Hydrasleeve              | 30.3      | 1.28      | 34870      | 22665.5    | 6.85 | 1114    |               | Clear                |
| 25/11/2021      | MW122    | 0960_MW122_211125         | 1.7-7.7_        | 3.9702     | 7.7            |             | 3.535      | 0.4352                                                           | Hydrasleeve              | 28.6      | 1.25      | 44823      | 29113      | 7.17 | 25      |               |                      |
| 25/11/2021      | MW124    | 0960_MW124_211125         | 1-6_            | 2.9183     | 6.0            |             | 2.831      | 0.0873                                                           | Hydrasleeve              | 30.1      | 1.51      | 85714      | 55719      | 7.24 | -32.6   |               |                      |
| 25/11/2021      | MW126    | 0960_MW126_211125         | 2-8_            | 4.5088     | 8              |             | 4.09       | 0.4188                                                           | Hydrasleeve              | 29.8      | 2.04      | 59812      | 38870      | 7.09 | 138.1   |               | Brown                |
| 25/11/2021      | MW127    | 0960_MW127_211125         | 2.5-8.5_        | 5.6238     | 8.5            |             | 4.86       | 0.7638                                                           | Hydrasleeve              | 28.4      | 1.33      | 71601      | 46540      | 7    | 125.4   |               | Clear                |
| 25/11/2021      | MW134    | 0960_MW134_211125         | 1-5.7_          | 2.5155     | 5.7            |             | 2.226      | 0.2895                                                           | Hydrasleeve              | 30.3      | 1.28      | 60099      | 39065      | 7.3  | 81.6    |               | Brown                |
| 24/11/2021      | MW135    | 0960_MW135_6.5-7_211124   | 6.5-7_          | 2.7858     | 7              |             | 2.49       | 0.2958                                                           | Hydrasleeve              | 27.4      | 1.79      | 35542      | 23101      | 7.54 | -19.9   |               | Clear                |
| 24/11/2021      | MW137    | 0960_MW137_2.5-3_211124   | 2.5-3_          | 2.1691     | 3              |             | 1.501      | 0.6681                                                           | Hydrasleeve              | 32.7      | 3.99      | 41303      | 26833      | 7.48 | -30.8   |               | Clear                |
| 24/11/2021      | MW138    | 0960_MW138_3-3.5_211124   | 3-3.5_          | 3.3074     | 3.5            |             | 3.269      | 0.0384                                                           | Hydrasleeve              | 30.5      | 2.36      | 43189      | 28072      | 7.4  | -172.1  | 120/220       | Clear to brown water |
| 25/11/2021      | MW139    | 0960_MW139_211125         | 2-7_            | 4.1386     | 7              |             | 3.779      | 0.3596                                                           | Hydrasleeve              | 28.4      | 1.11      | 63060      | 41003      | 7.12 | -67.8   |               | Clear                |
| 25/11/2021      | MW140    | 0960_MW140_3.5-4_211125   | 3.5-4_          | 2.5035     | 4              |             | 1.85       | 0.6535                                                           | Hydrasleeve              | 27.8      | 2.51      | 100090     | 65065      | 7.94 | 141.4   |               | Clear                |
| 25/11/2021      | MW141    | 0960_MW141_5-5.5_211125   | 5-5.5_          | 2.8141     | 5.5            |             | 2.17       | 0.6441                                                           | Hydrasleeve              | 27.3      | 2.34      | 47332      | 30758      | 7.75 | 124.6   |               | Clear                |
| 25/11/2021      | MW143    | 0960_MW143_3-3.5_211125   | 3-3.5_          | 2.8174     | 3.5            |             | 2.69       | 0.1274                                                           | Hydrasleeve              | 28.9      | 38.4      | 45293      | 29432      | 7.34 | 114.9   |               | Brown                |
| 24/11/2021      | MW144    | 0960_MW144_3-3.5_211124   | 3-3.5_          | 3.0481     | 3.5            |             | 2.8        | 0.2481                                                           | Hydrasleeve              | 28.4      | 2.75      | 36853      | 23959      | 7.41 | 27.3    |               | Brown                |
| 24/11/2021      | MW145    | 0960_MW145_5-5.5_211124   | 3-3.5_          | 3.1481     | 3.5            |             | 3.001      | 0.1471                                                           | Hydrasleeve              | 29.9      | 2.49      | 57770      | 37544      | 7.36 | 5.5     | 118/218       | Clear slightly brown |
| 24/11/2021      | MW146    | 0960_MW146_3-3.5_211124   | 3-3.5_          | 2.7937     | 3.5            |             | 2.561      | 0.2327                                                           | Hydrasleeve              | 29.4      | 3         | 98004      | 63692      | 7.39 | -15.7   |               | Clear                |
| 25/11/2021      | MW147    | 0960_MW147_3-3.5_211125   | 3-3.5_          | 2.9123     | 3.5            |             | 2.817      | 0.0953                                                           | Hydrasleeve              | 28.9      | 3.46      | 101218     | 65800      | 7.36 | 4.7     |               |                      |
| 24/11/2021      | MW148D   | 0960_MW148D_211124        | 14-20_          | 3.5778     | 20             |             | 3.41       | 0.1678                                                           | Hydrasleeve              | 28.3      | 0.67      | 80379      | 52260      | 7.26 | 76.3    |               | Clear                |
| 24/11/2021      | MW148S   | 0960_MW148S_211124        | 2-8_            | 3.6851     | 8              |             | 3.36       | 0.3251                                                           | Hydrasleeve              | 27.1      | 0.7       | 38882      | 25272      | 6.94 | 113.5   |               | Clear                |
| 24/11/2021      | MW151    | 0960_MW151_211124         | 2-8_            | 4.0631     | 8              |             | 3.68       | 0.3831                                                           | Hydrasleeve              | 29.7      | 1.96      | 16319      | 10621      | 7.14 | 85.6    |               | Cloudy,Brown         |
| 25/11/2021      | MW159    | 0960_MW159_211125         | 3-9_            | 4.1895     | 9              |             | 3.744      | 0.4455                                                           | Hydrasleeve              | 29.9      | 0.98      | 28563      | 18564      | 6.84 | -24     |               | Clear                |
| 24/11/2021      | MW162    | 0960_MW162_211124         | 17-20_          | 6.856      | 20             |             | 5.876      | 0.98                                                             | Hydrasleeve              | 32        | 2.89      | 1801       | 1452       | 8.25 | 77.1    |               | Brown                |
| 24/11/2021      | MW163    | 0960_MW163_211124         | 17-20_          | 6.7808     | 20             |             | 6.403      | 0.3778                                                           | Hydrasleeve              | 28.8      | 1.92      | 12802      | 8320       | 7.21 | 101.8   |               | Clear                |
| 25/11/2021      | MW164    | 0960_MW164_211125         | 17-20_          | 6.7893     | 20             |             | 5.868      | 0.9213                                                           | Hydrasleeve              | 29.5      | 1.71      | 14464      | 9395       | 7.15 | -55.5   |               | Clear                |
| 24/11/2021      | MW165    | 0960_MW165_211124         | 3-9_            | 6.1043     | 9              |             | 5.148      | 0.9563                                                           | Hydrasleeve              | 26.6      | 3.12      | 2727       | 1774.5     | 7.93 | 117.9   |               | Clear                |
| 24/11/2021      | MW166    | 0960_MW166_211124         | 2.5-8.5_        | 5.7441     | 8.5            |             | 4.812      | 0.9321                                                           | Hydrasleeve              | 29.6      | 3.27      | 2611       | 1683.5     | 7.91 | 104.4   |               | Brown                |
| 24/11/2021      | MW167    | 0960_MW167_211124         | 2.5-8.5_        | 6.2094     | 8.5            |             | 5.304      | 0.9054                                                           | Hydrasleeve              | 30        | 2.51      | 5437       | 3536       | 7.42 | 110.6   |               | Clear                |
| 24/11/2021      | MW168    | 0960_MW168_211124         | 2.5-8.5_        | 6.1713     | 8.5            |             | 5.335      | 0.8363                                                           | Hydrasleeve              | 30.2      | 1.31      | 12849      | 8352.5     | 6.94 | 150.2   | 127/227       | Brown                |
| 25/11/2021      | MW170    | 0960_MW170_211125         | 2.5-8.5_        | 5.639      | 8.5            |             | 4.994      | 0.645                                                            | Hydrasleeve              | 29        | 3.21      | 40988      | 26643.5    | 7    | 116.6   |               | Clear                |
| 25/11/2021      | MW172    | 0960_MW172_211125         | 2.5-8.5_        | 5.6193     | 8.5            |             | 4.933      | 0.6863                                                           | Hydrasleeve              | 29        | 2.2       | 35750      | 23244      | 7.01 | 108.4   |               | Clear                |
| 24/11/2021      | MW175    | 0960_MW175_5.5-6_211124   | 5.5-6_          | 4.7982     | 6              |             | 4.3        | 0.4982                                                           | Hydrasleeve              | 28.6      | 0.76      | 4932       | 3204.5     | 7.52 | -122.7  |               | Clear                |
| 24/11/2021      | MW176    | 0960_MW176_6-6.5_211124   | 6-6.5_          | 2.1594     | 6.5            |             | 1.78       | 0.3794                                                           | Hydrasleeve              | 28        | 2.61      | 68441      | 44460      | 7.91 | 99.9    |               | Clear                |
| 24/11/2021      | MW177    | 0960_MW177_3.5-4_211124   | 3.5-4_          | 2.2517     | 4              |             | 1.63       | 0.6217                                                           | Hydrasleeve              | 28.6      | 2.62      | 94268      | 61295      | 7.86 | 87.9    |               |                      |
| 24/11/2021      | MW178    | 0960_MW178_9-9.5_211124   | 9-9.5_          | 2.1762     | 9.5            |             | 1.86       | 0.3162                                                           | Hydrasleeve              | 26.6      | 0.71      | 90308      | 58760      | 7.36 | -21.5   |               | Cloudy               |
| 24/11/2021      | MW179    | 0960_MW179_3.2-3.7_211124 | 3.2-3.7_        | 2.2371     | 3.7            |             | 1.535      | 0.7021                                                           | Hydrasleeve              | 27.5      | 1.56      | 79070      | 51412      | 7.45 | -8.17   |               | Slightly turbid      |
| 24/11/2021      | MW180    | 0960_MW180_3.5-4_211124   | 3.5-4_          | 1.9226     | 4              |             | 1.64       | 0.2826                                                           | Hydrasleeve              | 28.3      | 2.2       | 91645      | 59551      | 7.49 | -61.7   |               |                      |
| 25/11/2021      | MW181    | 0960_MW181_3.5-4_211125   | 3.5-4_          | 2.2773     | 4              |             | 1.81       | 0.4673                                                           | Hydrasleeve              | 28.3      | 1.52      | 103120     | 67080      | 7.21 | 77.7    |               | Brown                |
| 25/11/2021      | MW211    | 0960_MW211_211125         | unknown*        | 6.3409     | unknown*       |             | 5.408      | 0.9329                                                           | Hydrasleeve              | 29.2      | 4.64      | 2264       | 1467       | 8.43 | 5.7     |               | Slightly brown       |
| 24/11/2021      | MW233    | 0960_MW233_211124         | 4-7_            | 6.262      | 7              |             | 5.247      | 1.015                                                            | Hydrasleeve              | 33.1      | 2.93      | 1707       | 1111.5     | 8.24 | 76.1    | 124/224       | Brown                |
| 24/11/2021      | MW238    | 0960_MW238_211124         | 3.0-6.0_        | 3.98       | 6              |             | 3.16       | 0.82                                                             | Sampled instead of MW016 | 26.4      | 3.57      | 9177       | 5967       | 7.74 | 5967    | QC115/215     | Cloudy,Brown         |
| 24/11/2021      | OTH103   | 0960_OTH103_211124        |                 |            |                |             |            |                                                                  | Direct_Into_Bottle       | 30.4      | 5.55      | 57027      | 37115      | 8.31 | 43.8    |               | Clear                |
| 25/11/2021      | OTH106   | 0960_OTH106_211125        |                 |            |                |             |            |                                                                  | Direct_Into_Bottle       | 27.3      | 6.11      | 56604      | 36790      | 8.14 | 133.7   |               | Clear                |
| 25/11/2021      | OTH107   | 0960_OTH107_211125        |                 |            |                |             |            |                                                                  | Direct_Into_Bottle       | 26.7      | 5.76      | 56496      | 36725      | 8.17 | 143     |               | Clear                |
| 24/11/2021      | OTH129   | 0960_OTH129_211124        |                 |            |                |             |            |                                                                  | Direct_Into_Bottle       | 32.5      | 3.84      | 59862      | 56931      | 8.27 | 7.4     |               | Clear                |
| 24/11/2021      | OTH132   | 0960_OTH132_211124        |                 |            |                |             |            |                                                                  | Direct_Into_Bottle       | 30.4      | 4.24      | 57296      | 37310      | 8.22 | 112.2   |               | Cloudy               |
| 24/11/2021      | OTH134   | 0960_OTH134_211124        |                 |            |                |             |            |                                                                  | Direct_Into_Bottle       | 30.6      | 4.07      | 57458      | 37310      | 8.07 | 116.2   |               | Cloudy               |

Note: \*No borelog is available for MW211

| Monitoring Site ID | Date       | Sample ID         | Sample Depth (m) | WaterBody Depth (m) | Flow Rate | SW Site Comments ?                                                                                         | Temp C | DO (mg/L) | EC (us/Cm) | TDS   | pH   | Eh (mV) | Water Colour | Turbidity |
|--------------------|------------|-------------------|------------------|---------------------|-----------|------------------------------------------------------------------------------------------------------------|--------|-----------|------------|-------|------|---------|--------------|-----------|
| SW001              | 24/11/2021 | 0960_SW001_211124 | 0.1              | 0.2                 | Slow      |                                                                                                            | 33.8   | 3.09      | 77382      | 50375 | 8.15 | 88.4    | Clear        | Low       |
| SW190              | 24/11/2021 |                   |                  |                     |           | Dry                                                                                                        |        |           |            |       |      |         |              |           |
| SW193              | 24/11/2021 |                   |                  |                     |           | Dry                                                                                                        |        |           |            |       |      |         |              |           |
| SW199              | 25/11/2021 |                   |                  |                     |           | Dry                                                                                                        |        |           |            |       |      |         |              |           |
| SW200              | 25/11/2021 |                   | 0                | 0                   |           | Dry                                                                                                        |        |           |            |       |      |         |              |           |
| SW205              | 25/11/2021 | 0960_SW205_211125 | 0                | 0.02                | Slow      | Limited surface water. only PFAS bottles collected. insufficient volume to take field parameters readings. |        |           |            |       |      |         | Brown        | Medium    |
| SW207              | 24/11/2021 | 0960_SW207_211124 | 0.2              | 0.3                 | Slow      |                                                                                                            | 28.8   | 3.96      | 62828      | 40833 | 7.79 | 15.4    |              | Medium    |
| SW208              | 25/11/2021 | 0960_SW208_211125 | 0.1              | 0.5                 | Slow      |                                                                                                            | 25.1   | 3.15      | 57644      | 37505 | 7.91 | 126.9   | Clear        | Low       |
| SW209              | 24/11/2021 | 0960_SW209_211124 | 0.2              | 0.3                 | Slow      | QC128/228 collected here                                                                                   | 31.2   | 4.55      | 65972      | 42870 | 7.68 | 37.2    | Clear        | Low       |
| SW210              | 24/11/2021 |                   | 0                | 0                   |           | Dry                                                                                                        |        |           |            |       |      |         |              |           |
| SW211              | 24/11/2021 | 0960_SW211_211124 | 0.1              | 0.2                 |           |                                                                                                            | 32     | 4.13      | 94791      | 81620 | 7.88 | 3.1     | Brown        | Medium    |
| SW219              | 25/11/2021 |                   | 0                | 0                   |           | Dry                                                                                                        |        |           |            |       |      |         |              |           |
| SW288              | 24/11/2021 |                   |                  |                     |           | Dry                                                                                                        |        |           |            |       |      |         |              |           |
| SW300              | 24/11/2021 | 0960_SW300_211124 | 0.1              | 0.2                 |           | QC126/226                                                                                                  | 30.8   | 3.97      | 95529      | 62075 | 7.86 | 101.1   | Cloudy       | Medium    |
| SW301              | 25/11/2021 | 0960_SW301_211125 | 0                | 0.05                | Slow      |                                                                                                            | 30     | 3.61      | 89283      | 58175 | 8.12 | 139     | Cloudy       | Medium    |
| SW302              | 24/11/2021 | 0960_SW302_211124 | 0.2              | 0.3                 | Slow      |                                                                                                            | 34.1   | 5.56      | 72640      | 47228 | 8.02 | -18.3   | Clear        | Low       |
| SW303              | 24/11/2021 | 0960_SW303_211124 | 0.1              | 0.2                 | Slow      |                                                                                                            | 29.8   | 3.18      | 68662      | 44642 | 7.74 | 36.1    | Clear        | Low       |
| SW304              | 24/11/2021 | 0960_SW304_211124 | 0.1              | 0.5                 | Slow      |                                                                                                            | 28.7   | 3.17      | 67438      | 43875 | 7.39 | 78.6    | Cloudy       | Medium    |
| SW305              | 24/11/2021 | 0960_SW305_211124 | 0.1              | 0.2                 | Slow      | QC123/223                                                                                                  | 28.8   | 3.51      | 64886      | 42185 | 7.6  | 67.4    | Clear        | Low       |
| SS234              | 24/11/2021 | 0690_SS234_211124 |                  |                     |           | DRY                                                                                                        |        |           |            |       |      |         |              |           |
| SS235              | 24/11/2021 | 0690_SS235_211124 |                  |                     |           | DRY                                                                                                        |        |           |            |       |      |         |              |           |
| SW114              | 24/11/2021 | 0690_SW114_211124 |                  |                     |           | DRY                                                                                                        |        |           |            |       |      |         |              |           |
| SS113              | 24/11/2021 | 0690_SS113_211124 |                  |                     |           | DRY                                                                                                        |        |           |            |       |      |         |              |           |
| SS231              | 24/11/2021 | 0690_SS231_211124 |                  |                     |           | DRY                                                                                                        |        |           |            |       |      |         |              |           |
| SS157              | 24/11/2021 | 0690_SS157_211124 |                  |                     |           | DRY                                                                                                        |        |           |            |       |      |         |              |           |
| SW265              | 24/11/2021 | 0690_SW265_211124 |                  |                     |           | DRY                                                                                                        |        |           |            |       |      |         |              |           |
| SW189              | 24/11/2021 | 0690_SW189_211124 |                  |                     |           | DRY                                                                                                        |        |           |            |       |      |         |              |           |
| SS192              | 24/11/2021 | 0690_SS192_211124 |                  |                     |           | DRY                                                                                                        |        |           |            |       |      |         |              |           |
| SS198              | 24/11/2021 | 0690_SS198_211124 |                  |                     |           | DRY                                                                                                        |        |           |            |       |      |         |              |           |
| SW293              | 24/11/2021 | 0690_SW293_211124 |                  |                     |           | DRY                                                                                                        |        |           |            |       |      |         |              |           |
| SS292              | 24/11/2021 | 0690_SS292_211124 |                  |                     |           | DRY                                                                                                        |        |           |            |       |      |         |              |           |
| SW291              | 24/11/2021 | 0690_SW291_211124 |                  |                     |           | DRY                                                                                                        |        |           |            |       |      |         |              |           |
| SS227              | 24/11/2021 | 0690_SS227_211124 |                  |                     |           | DRY                                                                                                        |        |           |            |       |      |         |              |           |
| SS108              | 24/11/2021 | 0690_SS108_211124 |                  |                     |           | DRY                                                                                                        |        |           |            |       |      |         |              |           |
| SS170              | 24/11/2021 | 0690_SS170_211124 |                  |                     |           | DRY                                                                                                        |        |           |            |       |      |         |              |           |
| SS168              | 24/11/2021 | 0690_SS168_211124 |                  |                     |           | DRY                                                                                                        |        |           |            |       |      |         |              |           |
| SS279              | 24/11/2021 | 0690_SS279_211124 |                  |                     |           | DRY                                                                                                        |        |           |            |       |      |         |              |           |
| SS166              | 24/11/2021 | 0690_SS166_211124 |                  |                     |           | DRY                                                                                                        |        |           |            |       |      |         |              |           |
| SS243              | 24/11/2021 | 0690_SS243_211124 |                  |                     |           | DRY                                                                                                        |        |           |            |       |      |         |              |           |
| SS174              | 24/11/2021 | 0690_SS174_211124 |                  |                     |           | DRY                                                                                                        |        |           |            |       |      |         |              |           |
| SW121              | 24/11/2021 | 0690_SW121_211124 |                  |                     |           | DRY                                                                                                        |        |           |            |       |      |         |              |           |
| SW122              | 24/11/2021 | 0690_SW122_211124 |                  |                     |           | DRY                                                                                                        |        |           |            |       |      |         |              |           |
| SS124              | 24/11/2021 | 0690_SS124_211124 |                  |                     |           | DRY                                                                                                        |        |           |            |       |      |         |              |           |
| SS277              | 24/11/2021 | 0690_SS277_211124 |                  |                     |           | DRY                                                                                                        |        |           |            |       |      |         |              |           |
| SS125              | 24/11/2021 | 0690_SS125_211124 |                  |                     |           | DRY                                                                                                        |        |           |            |       |      |         |              |           |
| SS278              | 24/11/2021 | 0690_SS278_211124 |                  |                     |           | DRY                                                                                                        |        |           |            |       |      |         |              |           |
| SS176              | 24/11/2021 | 0690_SS176_211124 |                  |                     |           | DRY                                                                                                        |        |           |            |       |      |         |              |           |



Table D2 Surface Water Records

PFAS OMP Biannual Monitoring Event  
RAAF Learmonth

| Monitoring<br>Site ID | Date       | Sample ID         | Sample<br>Depth (m) | WaterBody<br>Depth (m) | Flow Rate | SW Site Comments ? | Temp C | DO<br>(mg/L) | EC<br>(us/Cm) | TDS | pH | Eh (mV) | Water<br>Colour | Turbidity |
|-----------------------|------------|-------------------|---------------------|------------------------|-----------|--------------------|--------|--------------|---------------|-----|----|---------|-----------------|-----------|
| SW123                 | 24/11/2021 | 0690_SW123_211124 |                     |                        |           | DRY                |        |              |               |     |    |         |                 |           |
| SW298                 | 24/11/2021 | 0690_SW298_211124 |                     |                        |           | DRY                |        |              |               |     |    |         |                 |           |



| Monitoring Site ID | Date       | Sample ID         | Depth of Sampling (m) | Sampling Method    | Sample Condition | Sample Description                                                 | Other SS Site Comments   |
|--------------------|------------|-------------------|-----------------------|--------------------|------------------|--------------------------------------------------------------------|--------------------------|
| SD199              | 25/11/2021 | 0960_SD199_211125 | 0.1                   | Direct_into_Bottle | Dry              | Red, Fine to Medium Grained, Sand, no odour                        |                          |
| SD200              | 25/11/2021 | 0960_SD200_211125 | 0.1                   | Direct_into_Bottle | Dry              | Red, Fine to Medium Grained, Sand, no odour                        |                          |
| SD205              | 25/11/2021 | 0960_SD205_211125 | 0.1                   | Shovel_Trowel      | Wet              | Brown, wet, clay                                                   |                          |
| SD207              | 24/11/2021 | 0960_SD207_211124 | 0.1                   | Direct_into_Bottle | Wet              | Brown, no odour, low plasticity                                    |                          |
| SD208              | 25/11/2021 | 0960_SD208_211125 | 0.1                   | Shovel_Trowel      | Wet              | Beige sand, Fine to Coarse Grained, coarse w/ shells               |                          |
| SD209              | 24/11/2021 | 0960_SD209_211124 | 0.1                   | Direct_into_Bottle | Wet              | Brown, no odour                                                    |                          |
| SD210              | 24/11/2021 | 0960_SD210_211124 | 0.1                   | Direct_into_Bottle | Wet              | Moist under dry crust. No odour, red, sand                         |                          |
| SD211              | 24/11/2021 | 0960_SD211_211124 | 0.1                   | Shovel_Trowel      | Wet              | Brown, clay, hard                                                  |                          |
| SD219              | 25/11/2021 | 0960_SD219_211125 | 0.1                   | Direct_into_Bottle | Dry              | Red, fine to medium grained, sand, no odour                        |                          |
| SD300              | 24/11/2021 | 0960_SD300_211124 | 0.1                   | Shovel_Trowel      | Wet              | Brown, clay, wet, hard                                             |                          |
| SD301              | 24/11/2021 | 0960_SD301_211124 | 0.1                   | Shovel_Trowel      | Wet              | Brown, clay, medium plasticity                                     |                          |
| SD302              | 24/11/2021 | 0960_SD302_211124 | 0.1                   | Direct_into_Bottle | Wet              | Brown, no odour, clay, medium plasticity                           |                          |
| SD304              | 24/11/2021 | 0960_SD304_211124 | 0.1                   | Shovel_Trowel      | Wet              | Brown, clay, medium platicity                                      |                          |
| SD305              | 24/11/2021 | 0960_SD305_211124 | 0.1                   | Shovel_Trowel      | Wet              | Brown sandy clay                                                   |                          |
| SS108              | 25/11/2021 | 0960_SS108_211125 | 0.1                   | Direct_into_Bottle | Dry              | Red, fine grained, sand, no odour                                  |                          |
| SS113              | 25/11/2021 | 0960_SS113_211125 | 0.1                   | Direct_into_Bottle | Dry              | Red, fine grained, sand, no odour                                  |                          |
| SS114              | 24/11/2021 | 0960_SS114_211124 | 0.1                   | Shovel_Trowel      | Dry              | Brown, clay, medium plasticity                                     | QC117/217                |
| SS121              | 24/11/2021 | 0960_SS121_211124 | 0.1                   | Direct_into_Bottle | Dry              | redy brown, sandy clay, fine particles                             |                          |
| SS122              | 24/11/2021 | 0960_SS122_211124 | 0.1                   | Direct_into_Bottle | Dry              | reddy brown, sandy clay, fine particles                            |                          |
| SS123              | 24/11/2021 | 0960_SS123_211124 | 0.1                   | Direct_into_Bottle | Dry              | teddy brown, sandy clay, fine particled                            | QC122/222                |
| SS124              | 25/11/2021 | 0960_SS124_211125 | 0.1                   | Direct_into_Bottle | Dry              | redy brown, gravelly clay, fine to medium grained                  |                          |
| SS125              | 25/11/2021 | 0960_SS125_211125 | 0.1                   | Direct_into_Bottle | Dry              | clayey gravel, redy brown, fine to medium grained                  |                          |
| SS157              | 25/11/2021 | 0960_SS157_211125 | 0.1                   | Direct_into_Bottle | Dry              | redy brown, sandy clay, fine grained                               |                          |
| SS166              | 25/11/2021 | 0960_SS166_211125 | 0.1                   | Direct_into_Bottle | Dry              | redy brown, sandy clay, fine grained                               |                          |
| SS168              | 25/11/2021 | 0960_SS168_211125 | 0.1                   | Direct_into_Bottle | Dry              | redy brown, sandy clay, fine grained                               |                          |
| SS170              | 25/11/2021 | 0960_SS170_211125 | 0.1                   | Direct_into_Bottle | Dry              | Red, dry, fine to medium grained, sand                             |                          |
| SS174              | 25/11/2021 | 0960_SS174_211125 | 0.1                   | Direct_into_Bottle | Dry              | redy brown, sandy clay, fine grained                               |                          |
| SS176              | 25/11/2021 | 0960_SS176_211125 | 0.1                   | Direct_into_Bottle | Dry              | redy brown, gravelly sandy clay, fine to medium grained            |                          |
| SS189              | 25/11/2021 | 0960_SS189_211125 | 0.1                   | Direct_into_Bottle | Wet              | dilty clay, moist, fine grained with small amounts of gravel       |                          |
| SS190              | 24/11/2021 | 0960_SS190_211124 | 0.1                   | Shovel_Trowel      | Dry              | Brown, clay, hard, no odour                                        | QC119/219                |
| SS192              | 24/11/2021 | 0960_SS192_211124 | 0.1                   | Shovel_Trowel      | Dry              | Beige, fine to medium grained, sub angular to subrounded, sand     |                          |
| SS193              | 24/11/2021 | 0960_SS193_211124 | 0.1                   | Shovel_Trowel      | Wet              | Brown, clay, medium platicity, no odour                            |                          |
| SS198              | 24/11/2021 | 0960_SS198_211124 | 0.1                   | Direct_into_Bottle | Wet              | Red, fined to med grained, sub ang. To sub rounded, sand, No odou  | QC125/225 collected here |
| SS227              | 24/11/2021 | 0960_SS227_211124 | 0.1                   | Direct_into_Bottle | Dry              | Red, fined to med grained, sand, No odour                          | QC121/221 collected here |
| SS231              | 25/11/2021 | 0960_SS231_211125 | 0.1                   | Direct_into_Bottle | Dry              | Red, fined to med grained, sub ang. To sub rounded, sand, No odour |                          |
| SS234              | 24/11/2021 | 0960_SS234_211124 | 0.1                   | Shovel_Trowel      | Dry              | Brown, medium plasticity, clay, no odour                           |                          |
| SS235              | 25/11/2021 | 0960_SS235_211125 | 0.1                   | Direct_into_Bottle | Dry              | Red, fine to med. Grained sand, no odour                           |                          |
| SS243              | 25/11/2021 | 0960_SS243_211125 | 0.1                   | Direct_into_Bottle | Dry              | redy brown, sandy clay, fine grained                               |                          |
| SS265              | 25/11/2021 | 0960_SS265_211125 | 0.1                   | Direct_into_Bottle | Dry              | Red, fine to med. Grained sand, no odour                           |                          |
| SS277              | 25/11/2021 | 0960_SS277_211125 | 0.1                   | Direct_into_Bottle | Dry              | red to brown, gravelly clay, fine to medium grained                |                          |
| SS278              | 25/11/2021 | 0960_SS278_211125 | 0.1                   | Direct_into_Bottle | Dry              | red to brown, clayey silty gravel fine to medium grained           |                          |
| SS279              | 25/11/2021 | 0960_SS279_211125 | 0.1                   | Direct_into_Bottle | Dry              | red to brown, sandy clay, fine grained                             |                          |
| SS288              | 24/11/2021 | 0960_SS288_211124 | 0.1                   | Shovel_Trowel      | Dry              | Beige, fine to med. Grained sand, sub-angular to sub-rounded, sand |                          |
| SS291              | 24/11/2021 | 0960_SS291_211124 | 0.1                   | Direct_into_Bottle | Dry              | Red, fine to medium grained, sand no odour                         |                          |
| SS292              | 24/11/2021 | 0960_SS292_211124 | 0.1                   | Direct_into_Bottle | Dry              | Red, fine to medium grained sand, No odour                         |                          |
| SS293              | 24/11/2021 | 0960_SS293_211124 | 0.1                   | Direct_into_Bottle | Dry              | Red, fine to medium grained, sand, no odour                        |                          |
| SS298              | 25/11/2021 | 0960_SS298_211125 | 0.1                   | Shovel_Trowel      | Dry              | Brown, low plasicity, clay, no odour                               |                          |
| SS301              | 25/11/2021 | 0960_SS301_211125 | 0.1                   | Shovel_Trowel      | Wet              | Brown, low plasticity, clay, no odour.                             |                          |

| Date of Bump Test | Project ID | Unit Brand/Model | Ambient Air Oxygen Calibration                         | Zero % Oxygen Solution Calibration                    | Standard Concentrations                                                                                                                                            | Ambient Temperature (°C) | Bump Test Reading                                   | Bump Test Readings within ±5%?                                                                                                                                                                                                                          | Comment | Test by (Name) | (Signature)                                                                           |
|-------------------|------------|------------------|--------------------------------------------------------|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------------|---------------------------------------------------------------------------------------|
| 22/11/21          | DEFOUR     | YSI #14E102 596  | 100% Saturation? <input checked="" type="checkbox"/> Y | 0% Calibration? <input checked="" type="checkbox"/> Y | pH 4.00 <input checked="" type="checkbox"/> Y / N<br>pH 7.00 <input checked="" type="checkbox"/> Y / N<br>EC: 2,760µS/cm <input checked="" type="checkbox"/> Y / N | 29.8                     | pH 4.00: 4.01<br>pH 7.00: 7.03<br>Temp:<br>EC: 2781 | pH 4.00: (± pH 0.2) <input checked="" type="checkbox"/> Y / N<br>pH 7.00: (± pH 0.2) <input checked="" type="checkbox"/> Y / N<br>Temp: (± 2°C) <input checked="" type="checkbox"/> Y / N<br>EC: (± 150µS/cm) <input checked="" type="checkbox"/> Y / N |         | MG             |    |
| 22/11/21          | HEH-B      | YSI #19K102 536  | 100% Saturation? <input checked="" type="checkbox"/> Y | 0% Calibration? <input checked="" type="checkbox"/> Y | pH 4.00 <input checked="" type="checkbox"/> Y / N<br>pH 7.00 <input checked="" type="checkbox"/> Y / N<br>EC: 2,760µS/cm <input checked="" type="checkbox"/> Y / N | 30.2                     | pH 4.00: 3.98<br>pH 7.00: 6.99<br>Temp:<br>EC: 2859 | pH 4.00: (± pH 0.2) <input checked="" type="checkbox"/> Y / N<br>pH 7.00: (± pH 0.2) <input checked="" type="checkbox"/> Y / N<br>Temp: (± 2°C) <input checked="" type="checkbox"/> Y / N<br>EC: (± 150µS/cm) <input checked="" type="checkbox"/> Y / N |         | MG             |    |
| 22/11/21          | HEH-B      | YSI #21G105 322  | 100% Saturation? <input checked="" type="checkbox"/> Y | 0% Calibration? <input checked="" type="checkbox"/> Y | pH 4.00 <input checked="" type="checkbox"/> Y / N<br>pH 7.00 <input checked="" type="checkbox"/> Y / N<br>EC: 2,760µS/cm <input checked="" type="checkbox"/> Y / N | 31.0                     | pH 4.00: 4.00<br>pH 7.00: 7.04<br>Temp:<br>EC: 2750 | pH 4.00: (± pH 0.2) <input checked="" type="checkbox"/> Y / N<br>pH 7.00: (± pH 0.2) <input checked="" type="checkbox"/> Y / N<br>Temp: (± 2°C) <input checked="" type="checkbox"/> Y / N<br>EC: (± 150µS/cm) <input checked="" type="checkbox"/> Y / N |         | MG             |    |
| 23/11/21          | HEH-B      | YSI #14E102 596  | 100% Saturation? <input checked="" type="checkbox"/> Y | 0% Calibration? <input checked="" type="checkbox"/> Y | pH 4.00 <input checked="" type="checkbox"/> Y / N<br>pH 7.00 <input checked="" type="checkbox"/> Y / N<br>EC: 2,760µS/cm <input checked="" type="checkbox"/> Y / N | 30.8                     | pH 4.00: 4.03<br>pH 7.00: 7.05<br>Temp:<br>EC: 2801 | pH 4.00: (± pH 0.2) <input checked="" type="checkbox"/> Y / N<br>pH 7.00: (± pH 0.2) <input checked="" type="checkbox"/> Y / N<br>Temp: (± 2°C) <input checked="" type="checkbox"/> Y / N<br>EC: (± 150µS/cm) <input checked="" type="checkbox"/> Y / N |         | MG             |    |
| 23/11/21          | HEH-B      | YSI #19K102 536  | 100% Saturation? <input checked="" type="checkbox"/> Y | 0% Calibration? <input checked="" type="checkbox"/> Y | pH 4.00 <input checked="" type="checkbox"/> Y / N<br>pH 7.00 <input checked="" type="checkbox"/> Y / N<br>EC: 2,760µS/cm <input checked="" type="checkbox"/> Y / N | 30.4                     | pH 4.00: 4.00<br>pH 7.00: 7.01<br>Temp:<br>EC: 2803 | pH 4.00: (± pH 0.2) <input checked="" type="checkbox"/> Y / N<br>pH 7.00: (± pH 0.2) <input checked="" type="checkbox"/> Y / N<br>Temp: (± 2°C) <input checked="" type="checkbox"/> Y / N<br>EC: (± 150µS/cm) <input checked="" type="checkbox"/> Y / N |         | MG             |  |
| 23/11/21          | HEH-B      | YSI #21G105 322  | 100% Saturation? <input checked="" type="checkbox"/> Y | 0% Calibration? <input checked="" type="checkbox"/> Y | pH 4.00 <input checked="" type="checkbox"/> Y / N<br>pH 7.00 <input checked="" type="checkbox"/> Y / N<br>EC: 2,760µS/cm <input checked="" type="checkbox"/> Y / N | 29.8                     | pH 4.00: 4.02<br>pH 7.00: 7.03<br>Temp:<br>EC: 2765 | pH 4.00: (± pH 0.2) <input checked="" type="checkbox"/> Y / N<br>pH 7.00: (± pH 0.2) <input checked="" type="checkbox"/> Y / N<br>Temp: (± 2°C) <input checked="" type="checkbox"/> Y / N<br>EC: (± 150µS/cm) <input checked="" type="checkbox"/> Y / N |         | MG             |  |
| 24/11/21          | HEH-B      | YSI #14E102 596  | 100% Saturation? <input checked="" type="checkbox"/> Y | 0% Calibration? <input checked="" type="checkbox"/> Y | pH 4.00 <input checked="" type="checkbox"/> Y / N<br>pH 7.00 <input checked="" type="checkbox"/> Y / N<br>EC: 2,760µS/cm <input checked="" type="checkbox"/> Y / N | 31.0                     | pH 4.00: 4.01<br>pH 7.00: 7.02<br>Temp:<br>EC: 2798 | pH 4.00: (± pH 0.2) <input checked="" type="checkbox"/> Y / N<br>pH 7.00: (± pH 0.2) <input checked="" type="checkbox"/> Y / N<br>Temp: (± 2°C) <input checked="" type="checkbox"/> Y / N<br>EC: (± 150µS/cm) <input checked="" type="checkbox"/> Y / N |         | MG             |  |
| 24/11/21          | HEH-B      | YSI #19K102 536  | 100% Saturation? <input checked="" type="checkbox"/> Y | 0% Calibration? <input checked="" type="checkbox"/> Y | pH 4.00 <input checked="" type="checkbox"/> Y / N<br>pH 7.00 <input checked="" type="checkbox"/> Y / N<br>EC: 2,760µS/cm <input checked="" type="checkbox"/> Y / N | 30.8                     | pH 4.00: 4.05<br>pH 7.00: 7.06<br>Temp:<br>EC: 2845 | pH 4.00: (± pH 0.2) <input checked="" type="checkbox"/> Y / N<br>pH 7.00: (± pH 0.2) <input checked="" type="checkbox"/> Y / N<br>Temp: (± 2°C) <input checked="" type="checkbox"/> Y / N<br>EC: (± 150µS/cm) <input checked="" type="checkbox"/> Y / N |         | MG             |  |

| Date of Bump Test | Project ID | Unit Brand/ Model | Ambient Air Oxygen Calibration                         | Zero % Oxygen Solution Calibration                    | Standard Concentrations                                                                                                                                            | Ambient Temperature (°C) | Bump Test Reading                                        | Bump Test Readings within ±5%?                                                                                                                                                                                                                          | Comment | Test by (Name) | (Signature)                                                                         |
|-------------------|------------|-------------------|--------------------------------------------------------|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------------|-------------------------------------------------------------------------------------|
| 24/11/21          | HEH-A      | YSI #216105322    | 100% Saturation? <input checked="" type="checkbox"/> Y | 0% Calibration? <input checked="" type="checkbox"/> Y | pH 4.00 <input checked="" type="checkbox"/> Y / N<br>pH 7.00 <input checked="" type="checkbox"/> Y / N<br>EC: 2,760µS/cm <input checked="" type="checkbox"/> Y / N | 30.6                     | pH 4.00: 4.04<br>pH 7.00: 7.05<br>Temp: 2785<br>EC: 2785 | pH 4.00: (± pH 0.2) <input checked="" type="checkbox"/> Y / N<br>pH 7.00: (± pH 0.2) <input checked="" type="checkbox"/> Y / N<br>Temp: (± 2°C) <input checked="" type="checkbox"/> Y / N<br>EC: (± 150µS/cm) <input checked="" type="checkbox"/> Y / N |         | MG             |  |
| 25/11/21          | Learmonth  | YSI #14E102596    | 100% Saturation? <input checked="" type="checkbox"/> Y | 0% Calibration? <input checked="" type="checkbox"/> Y | pH 4.00 <input checked="" type="checkbox"/> Y / N<br>pH 7.00 <input checked="" type="checkbox"/> Y / N<br>EC: 2,760µS/cm <input checked="" type="checkbox"/> Y / N | 29.8                     | pH 4.00: 4.05<br>pH 7.00: 7.06<br>Temp: 2890<br>EC: 2890 | pH 4.00: (± pH 0.2) <input checked="" type="checkbox"/> Y / N<br>pH 7.00: (± pH 0.2) <input checked="" type="checkbox"/> Y / N<br>Temp: (± 2°C) <input checked="" type="checkbox"/> Y / N<br>EC: (± 150µS/cm) <input checked="" type="checkbox"/> Y / N |         | MG             |  |
| 25/11/21          | Learmonth  | YSI #191402535    | 100% Saturation? <input checked="" type="checkbox"/> Y | 0% Calibration? <input checked="" type="checkbox"/> Y | pH 4.00 <input checked="" type="checkbox"/> Y / N<br>pH 7.00 <input checked="" type="checkbox"/> Y / N<br>EC: 2,760µS/cm <input checked="" type="checkbox"/> Y / N | 30.1                     | pH 4.00: 4.04<br>pH 7.00: 7.07<br>Temp: 2856<br>EC: 2856 | pH 4.00: (± pH 0.2) <input checked="" type="checkbox"/> Y / N<br>pH 7.00: (± pH 0.2) <input checked="" type="checkbox"/> Y / N<br>Temp: (± 2°C) <input checked="" type="checkbox"/> Y / N<br>EC: (± 150µS/cm) <input checked="" type="checkbox"/> Y / N |         | MG             |  |
| 25/11/21          | Learmonth  | YSI #216105322    | 100% Saturation? <input checked="" type="checkbox"/> Y | 0% Calibration? <input checked="" type="checkbox"/> Y | pH 4.00 <input checked="" type="checkbox"/> Y / N<br>pH 7.00 <input checked="" type="checkbox"/> Y / N<br>EC: 2,760µS/cm <input checked="" type="checkbox"/> Y / N | 28.7                     | pH 4.00: 4.07<br>pH 7.00: 7.12<br>Temp: 2809<br>EC: 2809 | pH 4.00: (± pH 0.2) <input checked="" type="checkbox"/> Y / N<br>pH 7.00: (± pH 0.2) <input checked="" type="checkbox"/> Y / N<br>Temp: (± 2°C) <input checked="" type="checkbox"/> Y / N<br>EC: (± 150µS/cm) <input checked="" type="checkbox"/> Y / N |         | MG             |  |
|                   |            | YSI #             | 100% Saturation? <input type="checkbox"/> Y            | 0% Calibration? <input type="checkbox"/> Y            | pH 4.00 <input type="checkbox"/> Y / N<br>pH 7.00 <input type="checkbox"/> Y / N<br>EC: 2,760µS/cm <input type="checkbox"/> Y / N                                  |                          | pH 4.00:<br>pH 7.00:<br>Temp:<br>EC:                     | pH 4.00: (± pH 0.2) <input type="checkbox"/> Y / N<br>pH 7.00: (± pH 0.2) <input type="checkbox"/> Y / N<br>Temp: (± 2°C) <input type="checkbox"/> Y / N<br>EC: (± 150µS/cm) <input type="checkbox"/> Y / N                                             |         |                |                                                                                     |
|                   |            | YSI #             | 100% Saturation? <input type="checkbox"/> Y            | 0% Calibration? <input type="checkbox"/> Y            | pH 4.00 <input type="checkbox"/> Y / N<br>pH 7.00 <input type="checkbox"/> Y / N<br>EC: 2,760µS/cm <input type="checkbox"/> Y / N                                  |                          | pH 4.00:<br>pH 7.00:<br>Temp:<br>EC:                     | pH 4.00: (± pH 0.2) <input type="checkbox"/> Y / N<br>pH 7.00: (± pH 0.2) <input type="checkbox"/> Y / N<br>Temp: (± 2°C) <input type="checkbox"/> Y / N<br>EC: (± 150µS/cm) <input type="checkbox"/> Y / N                                             |         |                |                                                                                     |
|                   |            | YSI #             | 100% Saturation? <input type="checkbox"/> Y            | 0% Calibration? <input type="checkbox"/> Y            | pH 4.00 <input type="checkbox"/> Y / N<br>pH 7.00 <input type="checkbox"/> Y / N<br>EC: 2,760µS/cm <input type="checkbox"/> Y / N                                  |                          | pH 4.00:<br>pH 7.00:<br>Temp:<br>EC:                     | pH 4.00: (± pH 0.2) <input type="checkbox"/> Y / N<br>pH 7.00: (± pH 0.2) <input type="checkbox"/> Y / N<br>Temp: (± 2°C) <input type="checkbox"/> Y / N<br>EC: (± 150µS/cm) <input type="checkbox"/> Y / N                                             |         |                |                                                                                     |
|                   |            | YSI #             | 100% Saturation? <input type="checkbox"/> Y            | 0% Calibration? <input type="checkbox"/> Y            | pH 4.00 <input type="checkbox"/> Y / N<br>pH 7.00 <input type="checkbox"/> Y / N<br>EC: 2,760µS/cm <input type="checkbox"/> Y / N                                  |                          | pH 4.00:<br>pH 7.00:<br>Temp:<br>EC:                     | pH 4.00: (± pH 0.2) <input type="checkbox"/> Y / N<br>pH 7.00: (± pH 0.2) <input type="checkbox"/> Y / N<br>Temp: (± 2°C) <input type="checkbox"/> Y / N<br>EC: (± 150µS/cm) <input type="checkbox"/> Y / N                                             |         |                |                                                                                     |



## Calibration Report

### Multi-Parameter Water Quality Instrument

Customer: Cardno

Contact: [REDACTED]

Manufacturer: YSI

Instrument: Professional Plus with Quatro cable

Serial #: 21G105322

Cable length: 1m

| Item                    | Test                                                     | Pass | Comments                                             |
|-------------------------|----------------------------------------------------------|------|------------------------------------------------------|
| Battery                 | 2 x Alkaline C-cells                                     | ✓    | Voltage reading above 2.9V                           |
|                         | Battery Saver                                            | ✓    | Automatically turns off after 30 minutes if not used |
| Connections             | Condition                                                | ✓    | Good, clean                                          |
| Cable                   | Condition                                                | ✓    | Clean, no tears                                      |
| Display                 | Operation                                                | ✓    |                                                      |
| Firmware                | Version                                                  | ✓    | 4.0.0                                                |
| Keypad                  | Operational                                              | ✓    |                                                      |
| Display                 | Screen                                                   | ✓    |                                                      |
| Unit                    | Condition, seals and O-rings                             | ✓    |                                                      |
| Monitor housing         | Condition                                                | ✓    |                                                      |
| <b>pH</b>               |                                                          |      |                                                      |
|                         | Condition                                                | ✓    | Good, clean                                          |
|                         | pH millivolts for pH7 calibration range 0 mV ± 50 mV     | ✓    |                                                      |
|                         | pH 4 mV range + 165 to + 180 from 7 buffer mV value      | ✓    | 171.80 mV                                            |
|                         | pH slope                                                 | ✓    | 55 to 60 mV/pH, ideal 59mV 57.7                      |
|                         | Response time < 90 seconds                               | ✓    |                                                      |
|                         | Calibrated and conforms to manufacturer's specifications | ✓    |                                                      |
| <b>ORP</b>              |                                                          |      |                                                      |
|                         | Condition                                                | ✓    | Good, clean                                          |
|                         | Response time < 90 seconds                               | ✓    |                                                      |
|                         | within ± 80mv of reference Zobell Reading                | ✓    |                                                      |
|                         | Calibrated and conforms to manufacturer's specifications | ✓    | variance range ± 20mV 9 mV                           |
| <b>Conductivity</b>     |                                                          |      |                                                      |
|                         | Condition                                                | ✓    | Good, clean                                          |
|                         | Temperature                                              | ✓    | °C                                                   |
|                         | Conductivity cell constant 5.0 ± 1.0 in GLP file         | ✓    |                                                      |
|                         | Clean sensor reads less than 3 uS/cm in dry air          | ✓    |                                                      |
|                         | Calibrated and conforms to manufacturer's specifications | ✓    | µS/cm                                                |
| <b>Dissolved Oxygen</b> |                                                          |      |                                                      |
|                         | Condition                                                | ✓    | Good, clean                                          |
|                         | DO sensor in use                                         | ✓    | Galvanic                                             |
|                         | 1.25 mil PE membrane (yellow membrane):                  | ✓    |                                                      |
|                         | DO Sensor Value                                          | ✓    | (min 4.31 uA - max 8.00 uA) Avg 6.15 uA              |
|                         | Calibrated and conforms to manufacturer's specifications | ✓    | ppm                                                  |

This is to certify that the above instrument has been calibrated to the following specifications:

| Parameter                  | Standards                | Reference | Calibration Point | Span   | Units | Instrument Readings |       |       |
|----------------------------|--------------------------|-----------|-------------------|--------|-------|---------------------|-------|-------|
|                            |                          |           |                   |        |       | Before              | After | Units |
| Temperature                | Check Temp NATA          | Room Temp | 21.1              | 0      | °C    | NA                  | 21.1  | °C    |
| pH                         | pH 7.00                  | 361531    | 7.01              | -14.60 | mV    | 7.05                | 7.01  | pH    |
| pH                         | pH 4.00                  | 362911    | 4.00              | 157.20 | mV    | 4.05                | 4.00  | pH    |
| Conductivity               | 2764 µS/cm at 25°C       | 20/1007   | 2764              | GLP    | 5.07  | 2734                | 2764  | µS/cm |
| ORP (Reference check only) | Zobell A & B             | 21/0502   | 238               | 238    | mV    | 223.4               | 228.7 | mV    |
| Zero Dissolved Oxygen      | NaSO3 in distilled water | 10175     | 0.0               | NA     | NA    | -0.1                | 0.0   | %     |
| 100% Dissolved Oxygen      | 100% Air Saturation      | Air       | 100.0             | 5.4    | uA    | 99.4                | 100.0 | %     |

Calibrated by: Gaurav Kanwar

Calibration Date: 13-Nov-21

Next Due: 12-May-22





## Calibration Report

### Multi-Parameter Water Quality Instrument

Customer: Cardno

Contact: [REDACTED]

Manufacturer: YSI

Instrument: Professional Plus with Quatro cable

Serial #: 14E102596

Cable length: 1m

| Item                    | Test                                                     | Pass | Comments                                             |
|-------------------------|----------------------------------------------------------|------|------------------------------------------------------|
| Battery                 | 2 x Alkaline C-cells                                     | ✓    | Voltage reading above 2.9V                           |
|                         | Battery Saver                                            | ✓    | Automatically turns off after 30 minutes if not used |
| Connections             | Condition                                                | ✓    | Good, clean                                          |
| Cable                   | Condition                                                | ✓    | Clean, no tears                                      |
| Display                 | Operation                                                | ✓    |                                                      |
| Firmware                | Version                                                  | ✓    | 4.0.0                                                |
| Keypad                  | Operational                                              | ✓    |                                                      |
| Display                 | Screen                                                   | ✓    |                                                      |
| Unit                    | Condition, seals and O-rings                             | ✓    |                                                      |
| Monitor housing         | Condition                                                | ✓    |                                                      |
| <b>pH</b>               |                                                          |      |                                                      |
|                         | Condition                                                | ✓    | Good, clean                                          |
|                         | pH millivolts for pH7 calibration range 0 mV ± 50 mV     | ✓    |                                                      |
|                         | pH 4 mV range + 165 to + 180 from 7 buffer mV value      | ✓    | 173.80 mV                                            |
|                         | pH slope                                                 | ✓    | 55 to 60 mV/pH, ideal 59mV 58.15                     |
|                         | Response time < 90 seconds                               | ✓    |                                                      |
|                         | Calibrated and conforms to manufacturer's specifications | ✓    |                                                      |
| <b>ORP</b>              |                                                          |      |                                                      |
|                         | Condition                                                | ✓    | Good, clean                                          |
|                         | Response time < 90 seconds                               | ✓    |                                                      |
|                         | within ± 80mv of reference Zobell Reading                | ✓    |                                                      |
|                         | Calibrated and conforms to manufacturer's specifications | ✓    | variance range ± 20mV -1 mV                          |
| <b>Conductivity</b>     |                                                          |      |                                                      |
|                         | Condition                                                | ✓    | Good, clean                                          |
|                         | Temperature                                              | ✓    | °C                                                   |
|                         | Conductivity cell constant 5.0 ± 1.0 in GLP file         | ✓    |                                                      |
|                         | Clean sensor reads less than 3 uS/cm in dry air          | ✓    |                                                      |
|                         | Calibrated and conforms to manufacturer's specifications | ✓    | µS/cm                                                |
| <b>Dissolved Oxygen</b> |                                                          |      |                                                      |
|                         | Condition                                                | ✓    | Good, clean                                          |
|                         | DO sensor in use                                         | ✓    | Galvanic                                             |
|                         | 1.25 mil PE membrane (yellow membrane):                  | ✓    |                                                      |
|                         | DO Sensor Value                                          | ✓    | (min 4.31 uA - max 8.00 uA) Avg 6.15 uA              |
|                         | Calibrated and conforms to manufacturer's specifications | ✓    | ppm                                                  |

This is to certify that the above instrument has been calibrated to the following specifications:

|                            |                          |           |                   |        |       | Instrument Readings |       |       |
|----------------------------|--------------------------|-----------|-------------------|--------|-------|---------------------|-------|-------|
| Parameter                  | Standards                | Reference | Calibration Point | Span   | Units | Before              | After | Units |
| Temperature                | Check Temp NATA          | Room Temp | 23.2              | 0      | °C    | NA                  | 23.2  | °C    |
| pH                         | pH 7.00                  | 361531    | 7.01              | -20.30 | mV    | 7.01                | 7.01  | pH    |
| pH                         | pH 4.00                  | 362911    | 4.00              | 153.50 | mV    | 4.04                | 4.00  | pH    |
| Conductivity               | 2764 µS/cm at 25°C       | 20/1007   | 2764              | GLP    | 5.05  | 2739                | 2764  | µS/cm |
| ORP (Reference check only) | Zobell A & B             | 21/0502   | 233               | 233    | mV    | 207.6               | 234.3 | mV    |
| Zero Dissolved Oxygen      | NaSO3 in distilled water | 10175     | 0.0               | NA     | NA    | -0.3                | 0.0   | %     |
| 100% Dissolved Oxygen      | 100% Air Saturation      | Air       | 100.0             | 5.78   | uA    | 80                  | 100.0 | %     |

Calibrated by: Gaurav Kanwar

Calibration Date: 17-Nov-21

Next Due: 16-May-22



## Calibration Report

### Multi-Parameter Water Quality Instrument

Customer: Cardno

Contact: [REDACTED]

Manufacturer: YSI

Instrument: Professional Plus with Quatro cable

Serial #: 19K102536

Cable length: 1m

| Item                    | Test                                                     | Pass | Comments                                             |
|-------------------------|----------------------------------------------------------|------|------------------------------------------------------|
| Battery                 | 2 x Alkaline C-cells                                     | ✓    | Voltage reading above 2.9V                           |
|                         | Battery Saver                                            | ✓    | Automatically turns off after 30 minutes if not used |
| Connections             | Condition                                                | ✓    | Good, clean                                          |
| Cable                   | Condition                                                | ✓    | Clean, no tears                                      |
| Display                 | Operation                                                | ✓    |                                                      |
| Firmware                | Version                                                  | ✓    | 4.0.0                                                |
| Keypad                  | Operational                                              | ✓    |                                                      |
| Display                 | Screen                                                   | ✓    |                                                      |
| Unit                    | Condition, seals and O-rings                             | ✓    |                                                      |
| Monitor housing         | Condition                                                | ✓    |                                                      |
| <b>pH</b>               |                                                          |      |                                                      |
|                         | Condition                                                | ✓    | Good, clean                                          |
|                         | pH millivolts for pH7 calibration range 0 mV ± 50 mV     | ✓    |                                                      |
|                         | pH 4 mV range + 165 to + 180 from 7 buffer mV value      | ✓    | 173.90 mV                                            |
|                         | pH slope                                                 | ✓    | 55 to 60 mV/pH, ideal 59mV 58.15                     |
|                         | Response time < 90 seconds                               | ✓    |                                                      |
|                         | Calibrated and conforms to manufacturer's specifications | ✓    |                                                      |
| <b>ORP</b>              |                                                          |      |                                                      |
|                         | Condition                                                | ✓    | Good, clean                                          |
|                         | Response time < 90 seconds                               | ✓    |                                                      |
|                         | within ± 80mv of reference Zobell Reading                | ✓    |                                                      |
|                         | Calibrated and conforms to manufacturer's specifications | ✓    | variance range ± 20mV -2 mV                          |
| <b>Conductivity</b>     |                                                          |      |                                                      |
|                         | Condition                                                | ✓    | Good, clean                                          |
|                         | Temperature                                              | ✓    | °C                                                   |
|                         | Conductivity cell constant 5.0 ± 1.0 in GLP file         | ✓    |                                                      |
|                         | Clean sensor reads less than 3 uS/cm in dry air          | ✓    |                                                      |
|                         | Calibrated and conforms to manufacturer's specifications | ✓    | µS/cm                                                |
| <b>Dissolved Oxygen</b> |                                                          |      |                                                      |
|                         | Condition                                                | ✓    | Good, clean                                          |
|                         | DO sensor in use                                         | ✓    | Galvanic                                             |
|                         | 1.25 mil PE membrane (yellow membrane):                  | ✓    |                                                      |
|                         | DO Sensor Value                                          | ✓    | (min 4.31 uA - max 8.00 uA) Avg 6.15 uA              |
|                         | Calibrated and conforms to manufacturer's specifications | ✓    | ppm                                                  |

This is to certify that the above instrument has been calibrated to the following specifications:

|                            |                          |           |                   |        |       | Instrument Readings |       |       |
|----------------------------|--------------------------|-----------|-------------------|--------|-------|---------------------|-------|-------|
| Parameter                  | Standards                | Reference | Calibration Point | Span   | Units | Before              | After | Units |
| Temperature                | Check Temp NATA          | Room Temp | 23.7              | 0      | °C    | NA                  | 23.7  | °C    |
| pH                         | pH 7.00                  | 361531    | 7.01              | -39.50 | mV    | 7.1                 | 7.01  | pH    |
| pH                         | pH 4.00                  | 362911    | 4.00              | 134.40 | mV    | 4.09                | 4.00  | pH    |
| Conductivity               | 2764 µS/cm at 25°C       | 20/1007   | 2764              | GLP    | 4.92  | 2779                | 2764  | µS/cm |
| ORP (Reference check only) | Zobell A & B             | 21/0502   | 232               | 232    | mV    | 231.3               | 233.7 | mV    |
| Zero Dissolved Oxygen      | NaSO3 in distilled water | 10175     | 0.0               | NA     | NA    | 0.2                 | 0.0   | %     |
| 100% Dissolved Oxygen      | 100% Air Saturation      | Air       | 100.0             | 6.12   | uA    | 98.6                | 100.0 | %     |

Calibrated by: Gaurav Kanwar

Calibration Date: 17-Nov-21

Next Due: 16-May-22



APPENDIX

# E

DATA QUALITY REVIEW

## Data Quality Review

### PFAS OMP Biannual monitoring event

This appendix reviews the Quality Assurance (QA) and Quality Control (QC) documentation. Quality assurance encompasses the actions, procedures, checks and decisions undertaken to ensure sample integrity and representativeness, and the reliability and accuracy of analysis results. The QA documentation should also include an indication of the Data Quality Objectives sought in relation to each significant action, test or process involved in the assessment.

QC activities measure the effectiveness of the QA procedures by undertaking testing, and then comparing results to previously established objectives. QC work will include the internal laboratory testing as well as results of QC samples submitted such as field blanks and duplicates. The quality of the information and/or data is deemed satisfactory when the QC results demonstrate that agreed objectives have been met.

| QA/QC Aspects                                                     | Evidence & Evaluation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>QA Documentation</b>                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Project Quality Plan/Work Plan and Data Quality Objectives</b> | <p>The field investigation was carried out between the 24 November 2021 and 25 November 2021 and is in accordance with the proposed scope of work, as documented in the SAQP (ref DEF19009_RAAF Learmonth_SAQP_Rev5) issued to the client and in general compliance with the Australian standards AS 4482.1-2005 "Guide to Sampling and Investigation of Potentially Contaminated Soil, Part 1: Non-volatile and Semi-volatile Compounds", Standards Australia 1998. AS/NZ 5667:1998 <i>Water quality – sampling</i> and NEPM "National Environment Protection (Assessment of Site Contamination) Measure".</p> <p>A quality control program was implemented during the Investigation and the quality assurance procedures used have been reiterated in the report (DEF19009_Novmeber 2021 OMP Factual Report_RAAF Learmonth). In addition, a Health, Safety and Environment Work Method Statement (HSEWMS) was also prepared.</p> <p>The Data Quality Objectives were expressed in terms of the purpose of the assessment and the relevant assessment criteria.</p> |
| <b>Data Representativeness</b>                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Use of Composites</b>                                          | No Composites were used during the investigation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Holding Times</b>                                              | Chain of custody and laboratory reports provide evidence of holding times. Holding times were generally compliant with required timeframes.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Background samples</b>                                         | No background samples were collected as part of this investigation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Verification of field procedures</b>                           | <p>The methodology conducted during this investigation is documented in the body of the report, and was in general conformance with the SAQP.</p> <p>Non-disposable equipment was decontaminated between sample locations.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

QA/QC Aspects

Evidence & Evaluation

**Data Precision & Accuracy**

| QC sample Frequency | QC sample type  | SAQP required frequency                                                       | Sample Collected                                                                     |
|---------------------|-----------------|-------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|                     | Blind duplicate | 1 in 10 primary water samples (10%)<br>1 in 10 primary sediment samples (>5%) | 9 for 67 primary water samples (13.4%)<br>5 for 49 primary sediment samples (10.20%) |
|                     | Split duplicate | 1 in 10 primary water samples (10%)<br>1 in 10 primary sediment samples (>5%) | 9 for 67 primary water samples (13.4%)<br>5 for 49 primary sediment samples (10.20%) |
|                     | Rinsate         | 1 per day / equipment used                                                    | 6 (3x equipment for 2 days) (100%)                                                   |
|                     | Field Blank     | 1 per day / field team (esky)                                                 | 6 (3x field teams for 2 days) (100%)                                                 |

QC sample frequency was compliant with the SAQP for water and sediment duplicates, rinsates and field blanks.

- Relative Percentage Difference (RPD) Acceptance Criteria:

| Magnitude of Results | Acceptable RPD range |
|----------------------|----------------------|
| < 10 x LOR           | No limits            |
| 10 – 20 LOR          | 0% - 50%             |
| > 20 x LOR           | 0% - 20%             |

**Groundwater, Seepage water & Surface water**

- Number of primary samples analysed: 67
- Duplicate samples analysed: 9

The six (6) RPD exceedances were generally minor and are not considered to compromise the validity of the dataset, probably related to the low analyte concentrations of analyte pairs.

**Sediment**

- Number of primary samples analysed: 49
- Duplicate samples analysed: 5

The three (3) RPD exceedance were generally minor and are not considered to compromise the validity of the dataset, probably related to the low analyte concentrations of analyte pairs.

**QC Testing –  
Blind Replicates  
(Primary Lab)**

- Relative Percentage Difference (RPD) Acceptance Criteria:

| Magnitude of Results | Acceptable RPD range |
|----------------------|----------------------|
| < 10 x LOR           | No limits            |
| 10 – 20 LOR          | 0% - 50%             |
| > 20 x LOR           | 0% - 20%             |

**Groundwater, Seepage water & Surface water**

- Number of primary samples Analysed: 67
- Field Split Samples Analysed: 9

The 21 RPD exceedances were generally minor and probably related to the low analyte concentrations of analyte pairs and/or difference of methodologies between the primary and secondary laboratories.

**Sediment**

- Number of primary samples analysed: 49
- Field Split Samples Analysed: 5

The eight (8) RPD exceedances were generally minor and probably related to the low analyte concentrations of analyte pairs and/or difference of methodologies between the primary and secondary laboratories.

**QC Testing –  
Field Splits  
(Secondary Lab)**

| QA/QC Aspects                 | Evidence & Evaluation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Field Blanks</b>           | <p>Field Blanks were collected at a rate of one per field team (esky) per fieldwork day. All field blank samples tested reported analytes below the laboratory limit of reporting.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Laboratory Internal QC</b> | <p>Evidence of the laboratories internal QC testing is present and complete in the reports. ALS (Primary) performed internal QC with adequate testing and satisfactory results for method blank, laboratory control samples and laboratory duplicates.</p> <p>All Method Blank results were within acceptable range.</p> <p>All Matrix Spikes generally reported recoveries within the acceptance range of 70% to 130% with the exception of the following:</p> <ul style="list-style-type: none"> <li>▪ EP2114295, EP2114393, EP2114471 <ul style="list-style-type: none"> <li>- Multiple ID anonymous: Sulfate matrix spike recovery not determined due to the background concentrations exceeding 4x spike level.</li> </ul> </li> <li>▪ EP2114392 <ul style="list-style-type: none"> <li>- Sample ID MW148D: Chloride, matrix spike recovery not determined due to the background concentrations exceeding 4x spike level.</li> </ul> </li> <li>▪ EP2114394, EP2114300, EP2114394 <ul style="list-style-type: none"> <li>- Multiple ID Anonymous: Sulfate and chloride, matrix spike recovery not determined due to the background concentrations exceeding 4x spike level.</li> </ul> </li> <li>▪ EP2114393 <ul style="list-style-type: none"> <li>- Sample ID SS345: PFOS matrix spike recovery not determined due to the background concentrations exceeding 4x spike level.</li> </ul> </li> <li>▪ EP2114394 <ul style="list-style-type: none"> <li>- Sample ID MW145: Sulfate and Chloride matrix spike recovery not determined due to the background concentrations exceeding 4x spike level.</li> </ul> </li> <li>▪ EP2114471 <ul style="list-style-type: none"> <li>- Sample ID OTH107: Sulfate and Chloride matrix spike recovery not determined due to the background concentrations exceeding 4x spike level.</li> </ul> </li> <li>▪ EP2114473 <ul style="list-style-type: none"> <li>- Sample ID SW207: Sulfate and Chloride matrix spike recovery not determined due to the background concentrations exceeding 4x spike level.</li> </ul> </li> <li>▪ EP2114475 <ul style="list-style-type: none"> <li>- Sample ID Anonymous: 10:2 FTS recovery less than lower data quality objective.</li> </ul> </li> <li>▪ EP2114475 <ul style="list-style-type: none"> <li>- Sample ID SD199: 10:2 FTS recovery less than lower data quality objective.</li> </ul> </li> <li>▪ EP2114477 <ul style="list-style-type: none"> <li>- Sample ID MW170: Sulfate and Chloride matrix spike recovery not determined due to the background concentrations exceeding 4x spike level.</li> </ul> </li> </ul> <p>All laboratory duplicates generally reported RPDs within acceptable range with the exception of the following:</p> <ul style="list-style-type: none"> <li>▪ EP2114393 <ul style="list-style-type: none"> <li>- Sample ID SS190: PFOS, Sum of PFHxS and PFOS, Sum of PFAS (WA DER) and Sum of PFAS RPD exceeds LOR based limits (0% - 20%).</li> </ul> </li> <li>▪ EP2114392 <ul style="list-style-type: none"> <li>- Sample ID MW012: PFOS exceeds LOR based limits (0% - 20%).</li> </ul> </li> </ul> |

| QA/QC Aspects                                 | Evidence & Evaluation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                               | <ul style="list-style-type: none"> <li>- Sample ID MW105: PFPeS, PFHxS, Sum of PFHxS and PFOS, Sum of PFAS (WA DER) and Sum of PFAS exceeds LOR based limits (0% - 20%).</li> </ul> <p>All Quality Control sample frequencies were of an acceptable rate with exception of the following:</p> <ul style="list-style-type: none"> <li>▪ EP2114394, EP2114295, EP2114471, EP2114477 <ul style="list-style-type: none"> <li>- Matrix Spikes and Lab duplicates for PFAS were undertaken less than the target rate.</li> </ul> </li> <li>▪ EP2114399 <ul style="list-style-type: none"> <li>- Lab duplicates for PFAS were undertaken less than the target rate.</li> </ul> </li> </ul> |
| <b>Laboratory Method Detection Limit</b>      | Laboratory reports indicate the method detection limits were generally lower than the respective assessment criteria.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>NATA endorsement of laboratory reports</b> | <p>Laboratory reports were stamped with the NATA endorsement stamp and signature.</p> <p>ALS Accreditation No. 825</p> <p>Eurofins Accreditation No. 1261</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Calibration of Field Equipment</b>         | <p>All equipment used during the investigation was calibrated by the supplier prior to use.</p> <p>The equipment calibration certificates are provided in Appendix D.</p> <p>Cardno undertook in-field calibration checks (bump tests) for each YSI water quality meters per day of sampling. The bump tests found all parameters to be within the acceptable range. As such, Cardno is satisfied that the equipment calibrations were acceptable for this assessment.</p>                                                                                                                                                                                                          |
| <b>Decontamination and Equipment Blanks</b>   | Rinsate blanks were collected at a rate of one per day when reusable equipment is used (i.e. YSI, dipper, trowels/shovels...). All rinsate samples tested reported analytes concentrations below the laboratory LORs.                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Data Comparability</b>                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Standard Procedures</b>                    | Fieldwork procedures are detailed in the SAQP and reports and are comparable for each phase of Investigation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Qualified Personnel</b>                    | Staff involved in managing and reviewing the project and those involved in fieldwork are qualified personnel.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Sample Integrity</b>                       | Field Chain of Custody/Laboratory request forms can be found in Appendix C.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Data Completeness</b>                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Completeness of test program</b>           | The scope of work undertaken was generally consistent with the SAQP.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Validity of Data Set</b>                   | The data quality review indicates no significant systematic errors in the data collection process for groundwater and therefore, the data set used as the basis for the investigation is considered valid and complete.                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

## APPENDIX

# F

INFORMATION ABOUT ENVIRONMENTAL REPORTS



# About Site Environmental Assessment Reports

## 1. Introduction

This document explains the Environmental Site Assessment (ESA) process and the context that applies to the use of Environmental Reports issued by Cardno.

## 2. What is an ESA?

Environmental Site Assessments (ESA) are undertaken for a range of purposes, specific to the brief issued by the client in each case. The scope may include one or a combination of any of the following:

- ☐ A factual report of the condition of a portion of the site or one aspect of an entire site.
- ☐ Assessment of the contamination levels in soil to be removed from a site – a waste classification assessment.
- ☐ Validation of the success of remediation of a site or a portion of a site.
- ☐ Provision of a professional opinion about the suitability of a site for one or more uses, in terms of its contamination status.

The scope of any ESA needs to be defined at the outset.

An ESA is not an Environmental Audit. Such audits are undertaken in accordance with the provisions of regulations enacted in various states of Australia, and are referred to as Site Audits in some jurisdictions. Statutory audits provide certification by EPA accredited auditors that a site is suitable for one or more uses. An ESA may provide similar advice but cannot be used in place of an audit if the latter is required by regulation in any instance. However in some circumstances and jurisdictions an ESA is sufficient to provide “environmental sign-off” of a site.

An ESA may be undertaken for due diligence purposes, to establish whether the site has been impacted to the extent that some beneficial uses of the site may be precluded. Due diligence audits in many cases may be completed as non-statutory Audits, although in some jurisdictions they can also be statutory audits, if defined as such at the outset.

## 3. The ESA Process

The Client generally initiates the ESA process by specifying a brief which identifies the specific objectives of the assessment. If not, it is the consultants’ duty to so specify the ESA

In the case of an ESA to provide an opinion about the suitability of the site for use, it would be conducted in accordance with NEPM (Site Assessment). Such ESA would not commence until a thorough site history assessment (Phase 1 Assessment: to identify the potential for significant contamination at a site) is conducted. However, where the history is unclear, a broad screening of chemical parameters can be used to test environmental media. This normally includes a broad range of organic and inorganic compounds and elements, often referred to as an Environmental Screen.

(In the case of an ESA for a purpose other than to provide an opinion about the suitability of the site for use, it is not always necessary to undertake a Phase 1 assessment.)

The ESA requires sampling of soil at representative locations across the site. A NATA accredited laboratory performs the analysis of soil. It is impractical for all of the soil to be assessed. The ESA is often based on a statistical method of grid or random sampling, augmented by targeted sampling at locations known or suspected to be contaminated. Guidance on sampling strategy and density is provided in Australian Standard AS4482.1–2005. However, some considerable degree of judgement is still required in the application of any sampling and testing strategy. For example the blanket application of the “hot spot” method presented in this standard is often inappropriate given its limitations.

The field program also investigates the likelihood of contamination below the site surface. Field investigations must sample and test fill as well as the natural soils. If contamination is found then it is common for further work to be undertaken to characterise, to the extent practical, its vertical and horizontal extent. However, where fill is encountered and testing shows it to be uncontaminated, it must be realised that the heterogeneous nature of the material might mean that not all pockets of contaminated material can be detected using normal sampling regimes.

EPA guidelines for auditors, that may be relevant for an ESA, indicate the need in all cases to consider the potential for groundwater contamination in any site. This does not mean all sites need to be drilled to sample groundwater, but it is most often the case. Most hydrogeological settings and groundwater conditions are complex and vary in space and time. The condition of groundwater is investigated to identify if any beneficial use or environmental value of groundwater is precluded due to contamination.

As previously stated for soil, all groundwater at the site cannot be tested. The environmental investigations are conducted in accordance with industry standards and guidelines (e.g. EPA Vic Pub 668). This provides a level of confidence that a sufficiently comprehensive assessment of the groundwater at the site is achieved.

Where an investigation shows that groundwater is polluted, consideration should be given to assessing the risks and the need for and practicality of any clean up.

## 4. Environmental Assessment Report

The ESA Report details the findings of the ESA. It provides summary information on the site definition, the reasons for the assessment and other relevant facts. It reviews the scope and quality of the site investigations, laboratory testing and data analyses undertaken. These reports also present a review of the contamination status of the site, the need for any further clean up, and an opinion on the suitability of the site for a range of beneficial uses and land uses such as “residential – low density”, “commercial” etc, as appropriate.

However, as noted above, some ESA have a narrow scope such as for classification of waste soil for removal from site, and do not make conclusions on suitability of site for use.

The ESA Report generally includes copies of other documents and reports, necessary to support the assessment findings, presented as appendices. These can contain more detailed information than the body of the ESA Report. Care should be taken to also read the appended documents and the ESA report in full.

Cardno generally issues reports in electronic form (e-Report) on CD ROM. ESA Reports are issued in this format as Adobe Acrobat™ PDF files. However, a paper copy of the executive summary of the ESA Report is generally issued to the client, and others as required by the brief or by regulation.

## 5. Limitations of Environmental Assessment Report

The ESA Report is prepared in a manner that can be easily read by a lay person with a legitimate interest in the contamination status of the site, such as the site owner or occupier, EPA and Local Planning Authority. The ESA report is not intended for use by other parties or for other purposes. Anyone who uses the assessment report for purposes other than specified in the report, does so at their own risk.

The site should only be used for one or more of the beneficial uses and land uses identified in the ESA as suitable.

The conditions and qualifications may apply to the suitability of the site for use, and it is the responsibility of the Client to be cognizant of and accept these in accepting the report. Cardno are only responsible for the issuing of the ESA report but accepts no liability for the costs incurred in the implementation of ESA findings.

The ESA provides a “snapshot” of the site conditions at the time of the site investigation. Consequently, the report may not be valid at a later time if there has been any change to the contamination status of the site in that time. Verification of the status of the site may be required in cases where a significant time has elapsed, or site conditions have changed since the assessment and audit.

The ESA is necessarily limited by constraints such as time, cost and available information; although normal professional practice at the time has been applied with all due care to prepare the report. A necessary requirement of this process is the horizontal and vertical interpolation of data from discrete locations. However, site conditions are generally not homogenous and some discrepancies will occur between the actual and predicted results at locations not directly sampled. There is a risk that contamination may occur at the site and not be identified by a competent investigation and assessment. The approach adopted in sampling (a combination of statistically based grid and judgmental sampling) seeks to reduce, but cannot eliminate, this risk.

Where unexpected occurrences of contamination arise, subsequent to the issue of the ESA Report, Cardno should be permitted to make an interpretation of these facts in relation to the ESA Report findings. Consequently, the Client should inform Cardno and seek their opinion. Cardno accepts no liability for costs incurred due to such

unexpected occurrences, given the inherent uncertainties in the assessment process.

Cardno uses information provided by other parties as the basis for the ESA, and reliance on this information is at the discretion of Cardno. However, however Cardno cannot guarantee any of the facts, findings or conclusions presented by other parties. Cardno will not be liable for the use of information, provided by others that is subsequently found to be intentionally misleading.

The ESA Report is not and does not purport to be anything other than a contaminated land ESA. It is not a geotechnical report and bore logs reproduced are for interpretation of the likely distribution of contamination. They are not intended for geotechnical interpretations and may not be adequate for this purpose.

The ESA Report is not intended to be a comprehensive analysis of the presence and associated risk of asbestos in buildings and services. Where asbestos in buildings and services is known or likely, the report may only caution that an appropriately qualified person be engaged to undertake demolition to avoid contamination of the site.

**Cardno**

13 August 2015

# PFAS OMP First Flush Sampling Event Factual Report

2022 First Flush

RAAF Learmonth

304700525



Prepared for  
Department of Defence

8 September 2022

 **Cardno**

now

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## Document Information

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

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## Chemical Names

|       |                                            |
|-------|--------------------------------------------|
| DOC   | Dissolved Organic Carbon                   |
| DO    | Dissolved Oxygen                           |
| PFAS  | Per- and Poly-fluoroalkyl Substances       |
| PFHxS | Per-fluoro-hexane Sulphonate               |
| PFOA  | Per-fluoro-octanoic Acid                   |
| PFOS  | Per-fluoro-octane Sulfonate                |
| TDS   | Total Dissolved Solids (salinity of water) |
| TSS   | Total Suspended Solids                     |

## Technical Terms

|        |                                                                 |
|--------|-----------------------------------------------------------------|
| AFFF   | Aqueous Film Forming Foam                                       |
| AHD    | Australian Height Datum                                         |
| ANZECC | Australian and New Zealand Environment and Conservation Council |
| AS     | Australian Standard                                             |
| AST    | Above-ground Storage Tank                                       |
| BGL    | Below Ground Level                                              |
| COC    | Chain of Custody                                                |
| DQI    | Data Quality Indicator                                          |
| DQO    | Data Quality Objective                                          |
| EC     | Electrical Conductivity                                         |
| EPA    | Environment Protection Authority                                |
| ESA    | Environmental Site Assessment                                   |
| HIL    | Health Investigation Level                                      |
| HSL    | Health Screening Level                                          |
| LOR    | Limit of Reporting                                              |
| N/A    | Not Applicable                                                  |
| NATA   | National Association of Testing Authorities                     |
| NEPC   | National Environment Protection Council                         |
| NEPM   | National Environmental Protection Measure                       |
| QA     | Quality Assurance                                               |
| QC     | Quality Control                                                 |
| RPD    | Relative Percentage Difference                                  |
| SAQP   | Sampling and Analysis Quality Plan                              |
| SEPP   | State Environment Protection Policy                             |

## Units

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

## Site Specific

|     |                         |
|-----|-------------------------|
| OMP | Ongoing Monitoring Plan |
| FTG | Fire Training Ground    |

# 1 Introduction

## 1.1 Background

Cardno was engaged by the Australian Department of Defence (“the Client”) to carry out the Per- and Poly-Fluoroalkyl Substances (PFAS) Ongoing Monitoring Plan (OMP) First Flush sampling event at RAAF Base Learmonth (“the site”). The site is located approximately 30km south of Exmouth, WA, and is displayed in Figure 1 of Appendix A.

The OMP first flush monitoring event was carried out in accordance with the scope and limitations presented in Cardno’s Sampling and Analysis Quality Plan (SAQP):

- > Cardno, June 2021, Reference: DEF19009, ‘PFAS Ongoing Monitoring Plan Sampling and Analysis Quality Plan (SAQP) RAAF Base Learmonth, Rev 5.

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

For the purposes of this report:

- > “the site” was defined as RAAF Base Learmonth.
- > “the Management Area” was defined as comprising the site, plus the land east of the Base, including the salt pan, drainage channels, Wapet Creek and extends to Exmouth Gulf.

## 1.2 Purpose & Objectives

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

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

The objectives of the report are:

- > To provide a succinct summary of the First Flush 2022 sampling event and provision of analytical results with supporting tables and figures.
- > To provide confirmation of the current understanding of risk.
- > To provide supporting data for the assessment of management actions, where relevant.

## 1.3 Relevant Guidelines

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

- > National Environment Protection Council (NEPC), 1999, National Environmental Protection (Assessment of Site Contamination) Measure (as amended 2013) (ASC NEPM).
- > Heads of Environmental Protection Authority’s Australia and New Zealand (HEPA), January 2020, PFAS National Environmental Management Plan (NEMP) 2.0.
- > Australian Standard AS 4482-2005 Guide to the investigation and sampling of sites with potentially contaminated soils, Part 1 - Non-volatile and semi-volatile compounds.
- > Standards Australia 1998. AS/NZ 5667:1998 Water quality – sampling.
- > Australian and New Zealand Guidelines, 2018. Australian and New Zealand Guidelines for Fresh and Marine Water Quality.

- > Department of Water and Environmental Regulation (DWER), 2021, Assessment and Management of Contaminated Sites<sup>1</sup>.
- > Department of Defence, Department of Energy, 2018, Quality System Manual Schedule B15.
- > U.S. Environmental Protection Agency (EPA), 2000, 'Guidance for the Data Quality Objectives Process (EPA QA/G-4)'.
- > USEPA, 2002, 'Guidance on Environmental Data Verification and Data Validation (EPA QA/G-8)'.
- > National Health and Medical Research Council (NHMRC), August 2019, Guidance on Per and Polyfluoroalkyl Substances (PFAS) in Recreational Water.

## 2 Scope of Work

As per the SAQP requirements, the OMP First Flush monitoring event should be undertaken as close as possible following the first heavy rainfall of the wet season.

A heavy rainfall event, as defined in the Department of Environment and Energy (DoEE, 2017) guidelines, occurred at the site on the 13 May 2022. The Bureau of Meteorology recorded 31.6 mm of rain at the Learmonth Airport weather station (Station No. 5007) that day, which is close to the heavy rainfall benchmark for May 2022 at this station (34.9 mm). In addition, Base personnel observed pooling water in and around site which triggered the first flush sampling event mobilisation.

Cardno carried out the tasks detailed in the following sections, between the 17 and 18 May 2022, in order to satisfy the purpose and objectives of this assessment.

### 2.1 Surface water Monitoring

Sampling of selected surface water monitoring locations was performed in accordance with the SAQP, applying methods set out in Section 3 of this report. The surface water locations monitored as part of the OMP are presented in Table 2-1 and are shown on Figure 2, Appendix A.

Table 2-1 Surface water Monitoring Locations

| Monitoring Area                           | Location ID                                                                                                                                                                                                                                                |
|-------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Drainage channels<br>(source and pathway) | SW219, SW234, SW235, SW114, SW113, SW231, SW157, SW265, SW189, SW190, SW288, SW193, SW192, SW198, SW293, SW292, SW291, SW227, SW108, SW170, SW168, SW279, SW166, SW243, SW174, SW121, SW122, SW124, SW277, SW125, SW278, SW176, SW123, SW199, SW200, SW298 |
| Wapet Creek (Receptor)                    | SW211, SW300, SW210, SW001, SW302, SW303, SW209, SW304, SW305, SW207, SW208, SW205, SW301                                                                                                                                                                  |

### 2.2 Sediment Monitoring

Sampling of selected sediment monitoring locations was performed in accordance with the SAQP, applying methods set out in Section 3 of this report. The sediment locations monitored as part of the OMP are presented in Table 2-2 and are shown on Figure 3, Appendix A.

Table 2-2 Sediment Monitoring Locations

| Monitoring Area                           | Location ID                                                                                                                                                                                                                                                |
|-------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Drainage channels<br>(source and pathway) | SD219, SS234, SS235, SS114, SS113, SS231, SS157, SS265, SS189, SS190, SS288, SS193, SS192, SS198, SS293, SS292, SS291, SS227, SS108, SS170, SS168, SS279, SS166, SS243, SS174, SS121, SS122, SS124, SS277, SS125, SS278, SS176, SS123, SD199, SD200, SS298 |

<sup>1</sup> It is noted that site is located on Commonwealth Land and is regulated under the Commonwealth environmental legislation, the State based DWER guidelines are relevant for the sampling of off-site private properties and waterways.

| Monitoring Area        | Location ID                                                                               |
|------------------------|-------------------------------------------------------------------------------------------|
| Wapet Creek (Receptor) | SD211, SD300, SD210, SD301, SD302, SD303, SD209, SD304, SD305, SD207, SD208, SD205, SS301 |

**Note:**

'SS' indicates a shallow soil (dry) location, 'SD' indicates a sediment (wet) location based on the condition on the first time the location was sampled.

## 2.3 Data Management

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

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

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

## 2.4 Deviations from the OMP SAQP

Deviations from the SAQP for the First Flush 2022 monitoring event are presented in Table 2-3

Table 2-3 Summary of deviations from the OMP SAQP

| Location                                                                                                                                                                | Deviation                     | Comments                                                                                                                                             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| SW108, SW113, SW114, SW121, SW122, SW123, SW124, SW125, SW166, SW168, SW174, SW176, SW198, SW227, SW231, SW234, SW235, SW243, SW277, Sw278, SW279, SW291, SW292, SW293. | Not sampled for surface water | These locations were found dry. No impact – These locations have never been sampled for surface water as always been dry (sediment sample collected) |
| SW199, SW200                                                                                                                                                            | Not sampled                   | These locations were found dry. Limited impact, no surface water data collected – sediment samples collected.                                        |
| SW157, SW170, SW189, SW190, SW205, SW208, SW219, SW265, SW298.                                                                                                          | Incorrect pH readings         | No impact, parameter not influencing any key OMP decision.                                                                                           |



## 3 Methodology

### 3.1 Surface Water Sampling Methodology

Surface water monitoring procedure is detailed in Table 3-1.

Table 3-1 Surface water Monitoring Method

| Activity                                                        | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Field parameters                                                | <p>The following field parameters were recorded using a water quality meter:</p> <ul style="list-style-type: none"> <li>pH.</li> <li>electrical conductivity (EC).</li> <li>oxidation reduction potential (ORP).</li> <li>Dissolved oxygen (DO).</li> <li>Temperature.</li> </ul> <p>Field observations such as water flow, odours or sheen presence were also recorded on field sampling sheets.</p>                                                                                                                                                                           |
| Sampling Method                                                 | <p>Surface water samples were collected directly into sample containers using a 'Grab' (manual) sample method via a long-handled sampling device.</p> <p>Where depth permits, the sample container was positioned at least 10 cm below the surface water level and above the sediment bed and oriented with the capped opening facing downwards to avoid the collection of surface films. Samples were decanted into the laboratory supplied sample containers.</p>                                                                                                             |
| Decontamination procedure                                       | <p>All re-usable sampling equipment was thoroughly washed using PFAS &amp; phosphate-free detergent, then double rinsed with clean water before the sample collection.</p>                                                                                                                                                                                                                                                                                                                                                                                                      |
| Sample identification, preservation transport and holding times | <p>Each sample was labelled with the sample location, date, project identification number and sampler's initials.</p> <p>Samples were collected directly into appropriately preserved laboratory supplied bottles (Teflon-free) and packed in chilled containers for delivery to the laboratory under Chain of custody (CoC) documentation.</p> <p>Sample containers, preservation procedures, sample storage requirements and holding times were undertaken in accordance with those recommended by Standards Australia (AS/NZS 5667.1:1998 and AS 4482.1 as appropriate).</p> |
| Laboratory Testing                                              | <p>Surface water samples were submitted for the following analysis:</p> <ul style="list-style-type: none"> <li>Full PFAS analytical suite (refer to the SAQP for full list of analytes).</li> <li>Major anions and cations (include calcium, magnesium, sodium, potassium, chloride, sulfate, alkalinity and ionic balance).</li> </ul>                                                                                                                                                                                                                                         |
| Laboratory Testing - Quality Control                            | <p>Surface water QC samples were collected at the following frequencies as detailed in the SAQP (Cardno, 2021):</p> <ul style="list-style-type: none"> <li>Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch is less than 10 samples.</li> <li>Field triplicate (inter-laboratory) samples at 1 per 10 water samples and sent to a secondary laboratory.</li> <li>Rinsate blank sample at 1 per day [collected off re-used sampling equipment (e.g. interface probe)].</li> <li>Field blank samples at 1 per day.</li> </ul>     |

## 3.2 Sediment Sampling Methodology

Sediment sampling methodology is detailed in Table 3-2.

Table 3-2 Sediment Sampling Method

| Activity                             | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sample Collection                    | <p>Sediment samples were collected at the sediment/water interface using hand tools (e.g. trowel) with samples placed directly into appropriately labelled, laboratory supplied sample containers and packed in chilled containers for delivery to the laboratory under CoC documentation.</p> <p>At each sampling location, the sediment sample was visually assessed and observations (including physical description) recorded on field data sheets.</p>                                                                                                            |
| Field Records                        | <p>The following information was recorded on the field data sheets:</p> <ul style="list-style-type: none"> <li>Sampling time, date and name of the sampler.</li> <li>Weather conditions.</li> <li>Sample Collection method.</li> <li>Sampling equipment decontamination procedures where non-disposable sampling equipment is utilised.</li> </ul>                                                                                                                                                                                                                     |
| Decontamination                      | <p>All re-usable sampling equipment was thoroughly washed using PFAS &amp; phosphate-free detergent, then double rinsed with clean water before the sample collection.</p>                                                                                                                                                                                                                                                                                                                                                                                             |
| Laboratory Testing                   | <p>Sediment samples were submitted for the following analysis:</p> <ul style="list-style-type: none"> <li>Full PFAS analytical suite (refer to the SAQP for full list of analytes).</li> </ul>                                                                                                                                                                                                                                                                                                                                                                         |
| Laboratory Testing – Quality Control | <p>Sediment QC samples were collected at the following frequencies as detailed in the SAQP (Cardno, 2021):</p> <ul style="list-style-type: none"> <li>Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch is less than 10 samples.</li> <li>Field triplicate (inter-laboratory) samples at 1 per 10 water samples and sent to a secondary laboratory.</li> <li>Rinsate blank sample at 1 per day [collected off re-used sampling equipment (e.g. interface probe)].</li> <li>Field blank samples at 1 per day.</li> </ul> |

## 3.3 Quality Control / Quality Assurance

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

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

A detailed review of these aspects has been undertaken, the results of which are presented in Appendix E.

The QA/QC review concluded that there are no significant systematic errors in the data collection process and therefore, the dataset used for the assessment is considered valid and complete.

## 3.4 Assessment Criteria

### 3.4.1 Surface water

The adopted assessment criteria for surface water are detailed in Table 3-3.

Table 3-3 Criteria for Surface water

| Exposure Scenario                                                                                                                                                                                                                                                                                                             | Adopted Assessment Criteria |      | Guidance              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|------|-----------------------|
|                                                                                                                                                                                                                                                                                                                               | PFHxS / PFOS<br>µg/L        | PFOA |                       |
| Human Health – Recreational Water                                                                                                                                                                                                                                                                                             | 2 <sup>1</sup>              | 10   | NHMRC 2019, HEPA 2020 |
| Ecological – 99% species protection                                                                                                                                                                                                                                                                                           | 0.00023 <sup>2</sup>        | 19   | HEPA 2020             |
| 1. Sum of PFOS and PFHxS.<br>2. PFOS only; Practical screening guideline of 0.01 µg/L is based on typical current laboratory limit of reporting. Therefore, it should be noted that warning and action levels would not be relevant until the detection limits are reduced or the screening levels are increased (HEPA 2020). |                             |      |                       |

### 3.4.2 Sediment

It is noted that there are currently no Australian regulatory endorsed assessment levels for risk posed to ecology or human health by PFAS in sediment. As detailed in the SAQP (Cardno, 2021), sediment samples will be assessed with reference to the PFAS NEMP 2.0 (HEPA, 2020) soil criteria for consistency with the DSI (GHD, 2018). The adopted assessment criteria for sediment are detailed in Table 3-4.

Table 3-4 Criteria for Sediment

| Exposure Scenario                                           | Adopted Assessment Criteria |      | Guidance  |
|-------------------------------------------------------------|-----------------------------|------|-----------|
|                                                             | PFHxS / PFOS<br>mg/kg       | PFOA |           |
| Human Health - Commercial / industrial (on-base activities) | 20 <sup>1</sup>             | 50   | HEPA 2020 |
| Ecological – Direct exposure (interim guidelines)           | 1 <sup>2</sup>              | 10   | HEPA 2020 |
| Ecological - indirect exposure (interim guidelines)         | 0.01 <sup>2</sup>           | -    | HEPA 2020 |
| 1. Sum of PFOS and PFHxS.<br>2. PFOS only                   |                             |      |           |

## 4 Field Observations and Results

### 4.1 Surface water

#### 4.1.1 Summary of Field Observations

Surface water was observed pooling in the Northern and Southern Drainage channels (Figure 2, Appendix A) and in Wapet creek following the recent heavy rainfall event. The site's drains and central drainage channel were mostly found dry. The Central and Southern Drainage channels discharge into Wapet Creek; and the Northern Drainage channel and Wapet Creek discharge to Exmouth Gulf (GHD, 2018).

##### 4.1.1.1 Physicochemical parameters

Stabilised physicochemical parameters, water colour and turbidity observations recorded during the surface water sampling program are presented in field sampling records, included in Table D1, Appendix D. Parameters were generally consistent with the previous monitoring events. Surface water pH was near neutral, water was generally clear and brackish to saline. DO readings indicate aerobic surface water conditions. No visual or olfactory evidence of contamination were recorded.

#### 4.1.2 Surface water Laboratory Results

The results of laboratory analysis have been compared against adopted assessment criteria. Analytical data is presented in Table B1, Appendix B. A summary of results exceeding the adopted criteria is presented in Table 4-1. Laboratory results have also been compared to available historical data, Figure 2 in Appendix A presents the surface water monitoring locations where a first time detection of Sum of Per-fluoro-octane Sulfonate (PFOS) and Per-fluoro-hexane Sulphonate (PFHxS) or Per-fluoro-octanoic Acid (PFOA), or a new exceedance of guideline values were reported. The laboratory reports are provided in Appendix C.

Table 4-1 Summary of Surface Water Results Exceeding Adopted Criteria

| Analytes              | Locations Exceeding Criteria                                 | Lowest Criteria (µg/L) | Max Conc. (µg/L) | No. Analytical Results <sup>1</sup> | No. Results Above Criteria |
|-----------------------|--------------------------------------------------------------|------------------------|------------------|-------------------------------------|----------------------------|
| PFOA                  | -                                                            | 10 <sup>2</sup>        | <0.01            | 23                                  | 0                          |
| PFOS                  | SW157, SW170, SW189, SW190, SW192, SW193, SW219, SW265 SW288 | 0.01 <sup>3</sup>      | 1.11 (SW265)     | 23                                  | 9                          |
| Sum of PFHxS and PFOS | -                                                            | 2 <sup>2</sup>         | 1.13 (SW265)     | 23                                  | 0                          |

**Notes:**

1. Non-inclusive of quality control samples
2. Human Health - Recreational Use Guideline (HEPA, 2020)
3. Ecological - 99% species protection level (HEPA, 2020) – LOR (0.01 µg/L) adopted as a practical screening value.

Findings are summarised as follows:

- > Three surface water monitoring locations (SW157, SW170 and SW192), reported a first time detect of Sum of PFOS and PFHxS. These locations were sampled for the first time during the first flush event (previously always dry).
- > Three surface water monitoring locations (SW157, SW170 and SW192), reported a new exceedance of the Ecological guideline values (LOR adopted) for PFOS. These locations were sampled for the first time during the first flush event.
- > All surface water samples reported concentrations of PFOA below the laboratory LOR.
- > Nine out of the ten surface water samples taken in the drainage channels reported an exceedance of the Ecological criteria (LOR adopted) for PFOS.
- > None out of the thirteen surface water samples taken within Wapet Creek reported detectable PFOS concentrations.
- > None of the surface water samples exceeded the Recreational Use criteria.

## 4.2 Sediment

### 4.2.1 Summary of Field Observations

Field observations recorded at the time of sediment sampling are provided in Table D2, Appendix D.

### 4.2.2 Laboratory Results

The results of laboratory analysis have been compared against adopted assessment criteria. Sediment analytical results are presented in Table B2, Appendix B. A summary of results exceeding the adopted criteria is presented in Table 4-2. Laboratory results have also been compared to available historical data, Figure 3 in Appendix A presents the sediment monitoring locations. The laboratory reports are provided in Appendix C.

Table 4-2 Summary of Sediment Results Exceeding Adopted Criteria

| Analytes              | Locations Exceeding Criteria                           | Lowest Criteria (mg/kg) | Max Conc. (mg/kg) | No. Analytical Results <sup>1</sup> | No. Results Above Criteria |
|-----------------------|--------------------------------------------------------|-------------------------|-------------------|-------------------------------------|----------------------------|
| PFOA                  | -                                                      | 10 <sup>2</sup>         | 0.0003 (SS234)    | 49                                  | 0                          |
| PFOS                  | SS113, SS121, SS123, SS174, SS176, SS231, SS234, SS243 | 0.01 <sup>3</sup>       | 0.100 (SS113)     | 49                                  | 8                          |
| Sum of PFHxS and PFOS | -                                                      | 20 <sup>4</sup>         | 0.100 (SS113)     | 49                                  | 0                          |

**Notes:**

1. Non-inclusive of quality control samples
2. Ecological – Direct Exposure (HEPA, 2020)
3. Ecological – Indirect exposure (HEPA, 2020)
4. Human Health – Commercial/Industrial (HEPA, 2020)

Findings are summarised as follows:

- > No sediment sample reported a first time detect of PFOA, or Sum of PFOS and PFHxS.
- > No sediment sample reported a new exceedance of guideline values.
- > No exceedance of the Human Health Commercial/Industrial criteria was reported during the 2022 first flush event.
- > All sediment samples reported concentrations of PFOA below the laboratory LOR with the exception of SS234.
- > Eight out of twenty-three sediment samples taken in the on-site drainage channels reported an exceedance of the Ecological criteria for PFOS.
- > None of the thirteen sediment samples taken in the off-site drainage channels and Wapet Creek reported an exceedance of the Ecological criteria for PFOS.

## 4.3 Changes to the Monitoring Network Condition

No changes to the monitoring network condition were noted during this sampling event.

## 5 Summary and Conclusions

---

Cardno undertook the First Flush 2022 surface water and sediment monitoring event at RAAF Base Learmonth as part of the PFAS OMP following the first heavy rainfall of the wet season. Surface water sampling and testing was undertaken at 23 monitoring locations and sediment sampling and testing at 49 locations. 26 surface water monitoring locations were found dry and could not be sampled.

The surface water laboratory results reported the following:

- > Of the 23 samples tested, PFOS (9 samples) was detected above the adopted ecological 99% species protection criteria (LOR adopted).
- > Three surface water monitoring locations reported a first time detect of Sum of PFOS and PFHxS and new exceedance of the Ecological criteria (SW157, SW170 and SW192, sampled for the first time).

The sediment laboratory results reported the following:

- > Of the 49 samples that were tested, PFOS (8 samples) was detected above the adopted ecological criteria for indirect exposure (LOR adopted).
- > No sediment sampling location reported a first time detect of PFOA or Sum of PFHxS and PFOS.
- > No sediment sampling location reported a new exceedance of guideline values.

PFAS concentrations were generally of the same order of magnitude as historical range for all media sampled, with the exceptions reported above.

The next OMP sampling event for RAAF Base Learmonth will be the June 2022 biannual monitoring event. An Annual Interpretive Report will be prepared following this event.



## 6 References

### General References

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

### Site Specific References

18. Cardno, June 2021, PFAS OMP SAQP - RAAF Base Learmonth. Rev 5.
19. Cardno, April 2020, PFAS OMP Biannual Monitoring Event Factual Report RAAF Base Learmonth
20. Cardno, May 2020, PFAS OMP First Flush Sampling Event Factual Report RAAF Learmonth
21. Cardno, December 2020, PFAS OMP 2020 post-summer Biannual Monitoring Event RAAF Base Learmonth.
22. Cardno, February 2021, PFAS OMP 2020 post-winter Biannual Monitoring Event RAAF Base Learmonth
23. Department of Defence, May 2019, RAAF Base Learmonth PFAS Management Area Plan.
24. Department of Defence, May 2019, RAAF Base Learmonth PFAS Ongoing Monitoring Plan.
25. GHD, December 2018, RAAF Base Learmonth – PFAS Investigations – Preliminary and Detailed Site Investigation Report.
26. GHD, April 2019, RAAF Base Learmonth – PFAS Investigations – Ecological Risk Assessment Preliminary (ERA).

APPENDIX

A

FIGURES

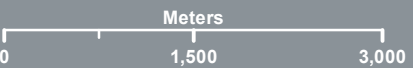


**Legend**

 Management Area

 RAAF Learmonth

FIGURE 1  
1:60,000 Scale at A3



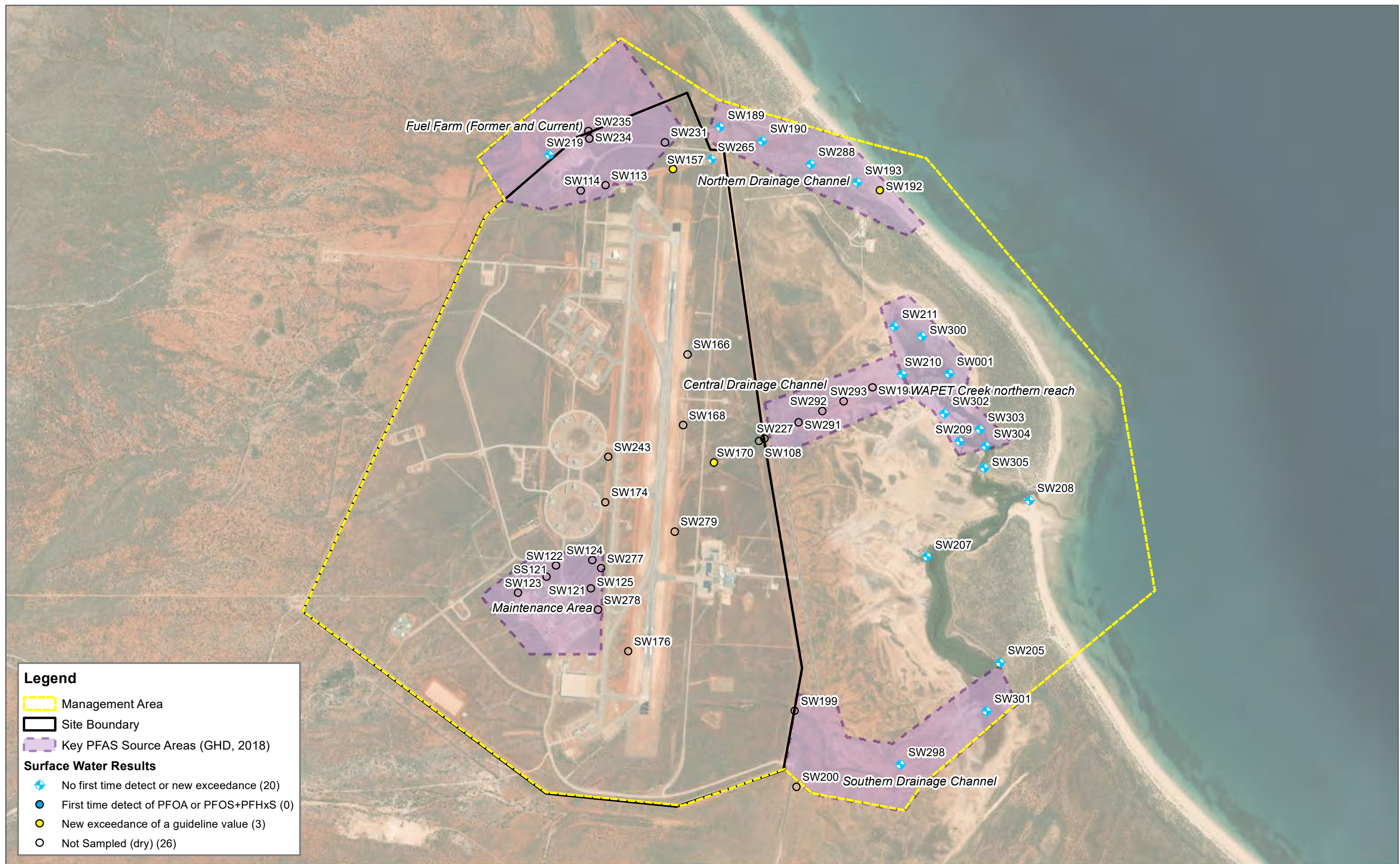
# Site Location

MAY 2022 FIRST FLUSH MONITORING EVENT  
RAAF BASE LEARMONTH  
DEPARTMENT OF DEFENCE



Map Produced by Cardno WA  
Date: 2022-08-02 | Project: DEF19009  
Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere  
Map: DEF19009\_WA\_0960-GS-001\_RegionalLocation 02.mxd  
Aerial Imagery Supplied by Google Earth





**Legend**

Management Area

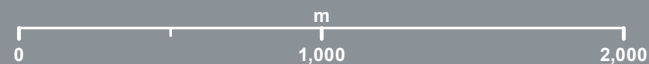
Site Boundary

Key PFAS Source Areas (GHD, 2018)

**Surface Water Results**

◆ No first time detect or new exceedance (20)  
◆ First time detect of PFOA or PFOS+PFHxS (0)  
● New exceedance of a guideline value (3)  
○ Not Sampled (dry) (26)

FIGURE 2  
1:25,000 Scale at A3



## Surface water monitoring locations & Results

MAY 2022 FIRST FLUSH SAMPLING EVENT  
RAAF BASE LEARMOUTH  
DEPARTMENT OF DEFENCE



Map Produced by Cardno WA  
Date: 2022-09-08 | Project: DEF19009  
Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere  
Map: DEF19009\_WA\_0960-GS-002\_SWMay22 01.mxd



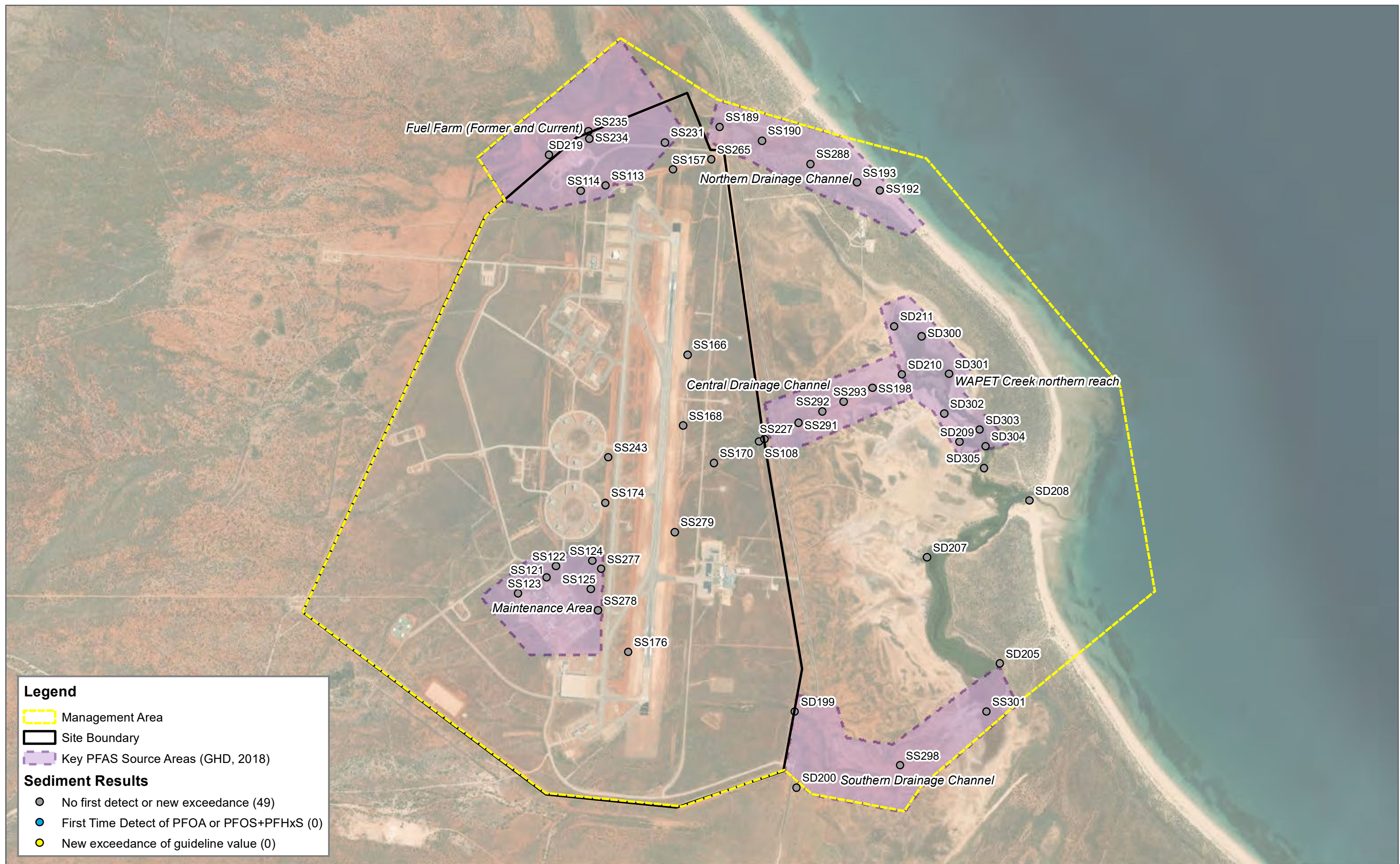


FIGURE 3  
1:25,000 Scale at A3

0 1,000 2,000  
m

## Sediment monitoring locations & Results

MAY 2022 FIRST FLUSH SAMPLING EVENT  
RAAF BASE LEARMOUTH  
DEPARTMENT OF DEFENCE



Map Produced by Cardno WA  
Date: 2022-08-02 | Project: DEF19009  
Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere  
Map: DEF19009\_WA\_0960-GS-003\_SDMay22 01.mxd



APPENDIX

# B

DATA ASSESSMENT TABLES



|                                   | PFAS - Perfluoroalkyl Sulfonic Acids |                                        |                                       |                                        |                                      |                                      | PFAS - Perfluoroalkyl Carboxylic Acids |                                 |                                |                                 |                               |                               |                               |                                   |                                   |
|-----------------------------------|--------------------------------------|----------------------------------------|---------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|----------------------------------------|---------------------------------|--------------------------------|---------------------------------|-------------------------------|-------------------------------|-------------------------------|-----------------------------------|-----------------------------------|
|                                   | Perfluorobutane sulfonic acid (PFBS) | Perfluoropentane sulfonic acid (PFPeS) | Perfluorohexane sulfonic acid (PFHxS) | Perfluoroheptane sulfonic acid (PFHpS) | Perfluorooctane sulfonic acid (PFOS) | Perfluorodecane sulfonic acid (PFDS) | Perfluorobutanoic acid (PFBA)          | Perfluoropentanoic acid (PFPeA) | Perfluorohexanoic acid (PFHxA) | Perfluoroheptanoic acid (PFHpA) | Perfluorooctanoic acid (PFOA) | Perfluorononanoic acid (PFNA) | Perfluorodecanoic acid (PFDA) | Perfluoroundecanoic acid (PFUnDA) | Perfluorododecanoic acid (PFDoDA) |
|                                   | µg/L                                 | µg/L                                   | µg/L                                  | µg/L                                   | µg/L                                 | µg/L                                 | µg/L                                   | µg/L                            | µg/L                           | µg/L                            | µg/L                          | µg/L                          | µg/L                          | µg/L                              | µg/L                              |
| LOR - Limit of Reporting          | 0.02                                 | 0.02                                   | 0.01                                  | 0.02                                   | 0.01                                 | 0.02                                 | 0.1                                    | 0.02                            | 0.02                           | 0.02                            | 0.01                          | 0.02                          | 0.02                          | 0.02                              | 0.02                              |
| PFAS NEMP 2020 Interim Marine 99% |                                      |                                        |                                       |                                        | 0.00023*                             |                                      |                                        |                                 |                                |                                 | 19                            |                               |                               |                                   |                                   |
| PFAS NEMP 2020 Recreational Water |                                      |                                        |                                       |                                        |                                      |                                      |                                        |                                 |                                |                                 | 10                            |                               |                               |                                   |                                   |

| Site ID | Location Code | Field ID          | Date       | Sample Type        | Lab Report No. |       |       |       |       |       |       |      |       |       |       |       |       |       |       |       |
|---------|---------------|-------------------|------------|--------------------|----------------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0960    |               | 0960_QC301_220517 | 17/05/2022 | Rinsate            | EP2205925      | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 |
| 0960    |               | 0960_QC301_220518 | 18/05/2022 | Rinsate            | EP2205970      | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 |
| 0960    |               | 0960_QC401_220517 | 17/05/2022 | Field Blank        | EP2205925      | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 |
| 0960    |               | 0960_QC401_220518 | 18/05/2022 | Field Blank        | EP2205970      | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 |
| 0960    | SW001         | 0960_SW001_220518 | 18/05/2022 | Normal             | EP2205970      | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 |
| 0960    | SW157         | 0960_SW157_220517 | 17/05/2022 | Normal             | EP2205925      | <0.02 | <0.02 | 0.02  | <0.02 | 0.07  | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 |
| 0960    | SW170         | 0960_SW170_220517 | 17/05/2022 | Normal             | EP2205925      | <0.02 | <0.02 | <0.01 | <0.02 | 0.16  | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 |
| 0960    | SW189         | 0960_SW189_220517 | 17/05/2022 | Normal             | EP2205925      | <0.02 | <0.02 | 0.01  | <0.02 | 0.44  | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 |
| 0960    | SW190         | 0960_SW190_220517 | 17/05/2022 | Normal             | EP2205925      | <0.02 | <0.02 | 0.01  | <0.02 | 0.26  | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 |
| 0960    | SW192         | 0960_SW192_220518 | 18/05/2022 | Normal             | EP2205970      | <0.02 | <0.02 | <0.01 | <0.02 | 0.07  | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 |
| 0960    | SW193         | 0960_QC110_220518 | 18/05/2022 | Field Duplicate    | EP2205970      | <0.02 | <0.02 | <0.01 | <0.02 | 0.09  | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 |
| 0960    | SW193         | 0960_QC210_220518 | 18/05/2022 | Interlab Duplicate | 890781         | <0.1  | <0.1  | <0.1  | <0.2  | <0.2  | <0.2  | <0.1 | <0.05 | <0.05 | <0.1  | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| 0960    | SW193         | 0960_SW193_220518 | 18/05/2022 | Normal             | EP2205970      | <0.02 | <0.02 | <0.01 | <0.02 | 0.08  | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 |
| 0960    | SW205         | 0960_SW205_220517 | 17/05/2022 | Normal             | EP2205925      | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 |
| 0960    | SW207         | 0960_SW207_220518 | 18/05/2022 | Normal             | EP2205970      | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 |
| 0960    | SW208         | 0960_QC109_220517 | 17/05/2022 | Field Duplicate    | EP2205925      | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 |
| 0960    | SW208         | 0960_QC209_220517 | 17/05/2022 | Interlab Duplicate | 890781         | <0.1  | <0.1  | <0.1  | <0.2  | <0.2  | <0.2  | <0.1 | <0.05 | <0.05 | <0.1  | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| 0960    | SW208         | 0960_SW208_220517 | 17/05/2022 | Normal             | EP2205925      | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 |
| 0960    | SW209         | 0960_SW209_220518 | 18/05/2022 | Normal             | EP2205970      | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 |
| 0960    | SW210         | 0960_SW210_220518 | 18/05/2022 | Normal             | EP2205970      | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 |
| 0960    | SW211         | 0960_SW211_220518 | 18/05/2022 | Normal             | EP2205970      | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 |
| 0960    | SW219         | 0960_SW219_220517 | 17/05/2022 | Normal             | EP2205925      | <0.02 | <0.02 | <0.01 | <0.02 | 0.13  | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 |
| 0960    | SW265         | 0960_SW265_220517 | 17/05/2022 | Normal             | EP2205925      | <0.02 | <0.02 | 0.02  | <0.02 | 1.11  | 0.04  | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 |
| 0960    | SW288         | 0960_SW288_220518 | 18/05/2022 | Normal             | EP2205970      | <0.02 | <0.02 | <0.01 | <0.02 | 0.02  | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 |
| 0960    | SW298         | 0960_QC108_220517 | 17/05/2022 | Field Duplicate    | EP2205925      | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 |
| 0960    | SW298         | 0960_QC208_220517 | 17/05/2022 | Interlab Duplicate | 890781         | <0.1  | <0.1  | <0.1  | <0.2  | <0.2  | <0.2  | <0.1 | <0.05 | <0.05 | <0.1  | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| 0960    | SW298         | 0960_SW298_220517 | 17/05/2022 | Normal             | EP2205925      | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 |
| 0960    | SW300         | 0960_SW300_220518 | 18/05/2022 | Normal             | EP2205970      | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 |
| 0960    | SW301         | 0960_SW301_220517 | 17/05/2022 | Normal             | EP2205925      | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 |
| 0960    | SW302         | 0960_SW302_220518 | 18/05/2022 | Normal             | EP2205970      | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 |
| 0960    | SW303         | 0960_SW303_220518 | 18/05/2022 | Normal             | EP2205970      | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 |
| 0960    | SW304         | 0960_SW304_220518 | 18/05/2022 | Normal             | EP2205970      | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 |
| 0960    | SW305         | 0960_SW305_220518 | 18/05/2022 | Normal             | EP2205970      | <0.02 | <0.02 | <0.01 | <0.02 | <0.01 | <0.02 | <0.1 | <0.02 | <0.02 | <0.02 | <0.01 | <0.02 | <0.02 | <0.02 | <0.02 |

Environmental Standards  
HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%  
HEPA, January 2020, PFAS NEMP 2020 Recreational Water  
Env Stds Comments  
\*Practical screening guideline of 0.01 µg/L based on typical current laboratory limit of reporting (HEPA, 2020)  
Note:  
First Time detect of PFOA or PFHxS+PFOS  
New exceedance of guideline value

|                                   | Perfluorotridecanoic acid (PFTrDA) | Perfluorotetradecanoic acid (PFTeDA) | PFAS - (n:2) Fluorotelomer Sulfonic Acids |                                           |                                           |                                             | PFAS - Perfluoroalkyl Sulfonamides |                                               |                                                           |                                                      |                                              |                                                          |                                                     |                       | PFAS        |  |
|-----------------------------------|------------------------------------|--------------------------------------|-------------------------------------------|-------------------------------------------|-------------------------------------------|---------------------------------------------|------------------------------------|-----------------------------------------------|-----------------------------------------------------------|------------------------------------------------------|----------------------------------------------|----------------------------------------------------------|-----------------------------------------------------|-----------------------|-------------|--|
|                                   | µg/L                               | µg/L                                 | 4:2 Fluorotelomer sulfonic acid (4:2 FTS) | 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | 10:2 Fluorotelomer sulfonic acid (10:2 FTS) | Perfluorooctane sulfonamide (FOSA) | N-Methyl perfluorooctane sulfonamide (MeFOSA) | N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | N-methyl perfluorooctane sulfonamidoethanol (MeFOSE) | N-Ethyl perfluorooctane sulfonamide (EtFOSA) | N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA) | N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE) | Sum of PFHxS and PFOS | Sum of PFAS |  |
| LOR - Limit of Reporting          | 0.02                               | 0.05                                 | 0.05                                      | 0.05                                      | 0.05                                      | 0.05                                        | 0.02                               | 0.05                                          | 0.02                                                      | 0.05                                                 | 0.05                                         | 0.02                                                     | 0.05                                                | 0.01                  | 0.01        |  |
| PFAS NEMP 2020 Interim Marine 99% |                                    |                                      |                                           |                                           |                                           |                                             |                                    |                                               |                                                           |                                                      |                                              |                                                          |                                                     |                       |             |  |
| PFAS NEMP 2020 Recreational Water |                                    |                                      |                                           |                                           |                                           |                                             |                                    |                                               |                                                           |                                                      |                                              |                                                          |                                                     | 2                     |             |  |

| Site ID | Location Code | Field ID          | Date       | Sample Type        | Lab Report No. |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|---------|---------------|-------------------|------------|--------------------|----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0960    |               | 0960_QC301_220517 | 17/05/2022 | Rinsate            | EP2205925      | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 | <0.01 | <0.01 |
| 0960    |               | 0960_QC301_220518 | 18/05/2022 | Rinsate            | EP2205970      | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 | <0.01 | <0.01 |
| 0960    |               | 0960_QC401_220517 | 17/05/2022 | Field Blank        | EP2205925      | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 | <0.01 | <0.01 |
| 0960    |               | 0960_QC401_220518 | 18/05/2022 | Field Blank        | EP2205970      | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 | <0.01 | <0.01 |
| 0960    | SW001         | 0960_SW001_220518 | 18/05/2022 | Normal             | EP2205970      | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 | <0.01 | <0.01 |
| 0960    | SW157         | 0960_SW157_220517 | 17/05/2022 | Normal             | EP2205925      | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 | 0.09  | 0.09  |
| 0960    | SW170         | 0960_SW170_220517 | 17/05/2022 | Normal             | EP2205925      | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 | 0.16  | 0.16  |
| 0960    | SW189         | 0960_SW189_220517 | 17/05/2022 | Normal             | EP2205925      | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 | 0.45  | 0.45  |
| 0960    | SW190         | 0960_SW190_220517 | 17/05/2022 | Normal             | EP2205925      | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 | 0.27  | 0.27  |
| 0960    | SW192         | 0960_SW192_220518 | 18/05/2022 | Normal             | EP2205970      | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 | 0.07  | 0.07  |
| 0960    | SW193         | 0960_QC110_220518 | 18/05/2022 | Field Duplicate    | EP2205970      | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 | 0.09  | 0.09  |
| 0960    | SW193         | 0960_QC210_220518 | 18/05/2022 | Interlab Duplicate | 890781         | <0.05 | <0.05 | <0.2  | <0.2  | <0.2  | <0.2  | <0.2  | <0.2  | <0.2  | <0.2  | <0.2  | <0.2  | <0.2  | <0.1  | <0.05 |
| 0960    | SW193         | 0960_SW193_220518 | 18/05/2022 | Normal             | EP2205970      | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 | 0.08  | 0.08  |
| 0960    | SW205         | 0960_SW205_220517 | 17/05/2022 | Normal             | EP2205925      | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 | <0.01 | <0.01 |
| 0960    | SW207         | 0960_SW207_220518 | 18/05/2022 | Normal             | EP2205970      | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 | <0.01 | <0.01 |
| 0960    | SW208         | 0960_QC109_220517 | 17/05/2022 | Field Duplicate    | EP2205925      | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 | <0.01 | <0.01 |
| 0960    | SW208         | 0960_QC209_220517 | 17/05/2022 | Interlab Duplicate | 890781         | <0.05 | <0.05 | <0.2  | <0.2  | <0.2  | <0.2  | <0.2  | <0.2  | <0.2  | <0.2  | <0.2  | <0.2  | <0.2  | <0.1  | <0.05 |
| 0960    | SW208         | 0960_SW208_220517 | 17/05/2022 | Normal             | EP2205925      | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 | <0.01 | <0.01 |
| 0960    | SW209         | 0960_SW209_220518 | 18/05/2022 | Normal             | EP2205970      | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 | <0.01 | <0.01 |
| 0960    | SW210         | 0960_SW210_220518 | 18/05/2022 | Normal             | EP2205970      | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 | <0.01 | <0.01 |
| 0960    | SW211         | 0960_SW211_220518 | 18/05/2022 | Normal             | EP2205970      | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 | <0.01 | <0.01 |
| 0960    | SW219         | 0960_SW219_220517 | 17/05/2022 | Normal             | EP2205925      | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 | 0.13  | 0.13  |
| 0960    | SW265         | 0960_SW265_220517 | 17/05/2022 | Normal             | EP2205925      | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 | 1.13  | 1.17  |
| 0960    | SW288         | 0960_SW288_220518 | 18/05/2022 | Normal             | EP2205970      | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 | 0.02  | 0.02  |
| 0960    | SW298         | 0960_QC108_220517 | 17/05/2022 | Field Duplicate    | EP2205925      | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 | <0.01 | <0.01 |
| 0960    | SW298         | 0960_QC208_220517 | 17/05/2022 | Interlab Duplicate | 890781         | <0.05 | <0.05 | <0.2  | <0.2  | <0.2  | <0.2  | <0.2  | <0.2  | <0.2  | <0.2  | <0.2  | <0.2  | <0.2  | <0.1  | <0.05 |
| 0960    | SW298         | 0960_SW298_220517 | 17/05/2022 | Normal             | EP2205925      | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 | <0.01 | <0.01 |
| 0960    | SW300         | 0960_SW300_220518 | 18/05/2022 | Normal             | EP2205970      | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 | <0.01 | <0.01 |
| 0960    | SW301         | 0960_SW301_220517 | 17/05/2022 | Normal             | EP2205925      | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 | <0.01 | <0.01 |
| 0960    | SW302         | 0960_SW302_220518 | 18/05/2022 | Normal             | EP2205970      | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 | <0.01 | <0.01 |
| 0960    | SW303         | 0960_SW303_220518 | 18/05/2022 | Normal             | EP2205970      | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 | <0.01 | <0.01 |
| 0960    | SW304         | 0960_SW304_220518 | 18/05/2022 | Normal             | EP2205970      | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 | <0.01 | <0.01 |
| 0960    | SW305         | 0960_SW305_220518 | 18/05/2022 | Normal             | EP2205970      | <0.02 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.02 | <0.05 | <0.02 | <0.05 | <0.05 | <0.02 | <0.05 | <0.01 | <0.01 |

Environmental Standards  
HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%  
HEPA, January 2020, PFAS NEMP 2020 Recreational Water  
Env Stds Comments  
\*Practical screening guideline of 0.01 µg/L based on typical current laboratory limit of reporting (HEPA, 2020)  
Note:  
First Time detect of PFOA or PFHxS+PFOS  
New exceedance of guideline value

|                                   | Inorganics                         |                                         |                                    |                                |              |               |          |               |                                                  | Metals             |                      |                      |                   |
|-----------------------------------|------------------------------------|-----------------------------------------|------------------------------------|--------------------------------|--------------|---------------|----------|---------------|--------------------------------------------------|--------------------|----------------------|----------------------|-------------------|
|                                   | Carbonate Alkalinity<br>(as CaCO3) | Alkalinity<br>(Bicarbonate as<br>CaCO3) | Alkalinity (Hydroxide)<br>as CaCO3 | Alkalinity (total) as<br>CaCO3 | Anions Total | Cations Total | Chloride | Ionic Balance | Sulphate as SO4 -<br>Turbidimetric<br>(filtered) | Calcium (filtered) | Magnesium (filtered) | Potassium (filtered) | Sodium (filtered) |
|                                   | mg/L                               | mg/L                                    | mg/L                               | mg/L                           | meq/L        | meq/L         | mg/L     | %             | mg/L                                             | mg/L               | mg/L                 | mg/L                 | mg/L              |
| LOR - Limit of Reporting          | 1                                  | 1                                       | 1                                  | 1                              | 0.01         | 0.01          | 1        | 0.01          | 1                                                | 1                  | 1                    | 1                    | 1                 |
| PFAS NEMP 2020 Interim Marine 99% |                                    |                                         |                                    |                                |              |               |          |               |                                                  |                    |                      |                      |                   |
| PFAS NEMP 2020 Recreational Water |                                    |                                         |                                    |                                |              |               |          |               |                                                  |                    |                      |                      |                   |

| Site ID | Location Code | Field ID          | Date       | Sample Type        | Lab Report No. |    |     |    |     |      |      |        |      |       |     |       |     |        |
|---------|---------------|-------------------|------------|--------------------|----------------|----|-----|----|-----|------|------|--------|------|-------|-----|-------|-----|--------|
| 0960    |               | 0960_QC301_220517 | 17/05/2022 | Rinsate            | EP2205925      |    |     |    |     |      |      |        |      |       |     |       |     |        |
| 0960    |               | 0960_QC301_220518 | 18/05/2022 | Rinsate            | EP2205970      |    |     |    |     |      |      |        |      |       |     |       |     |        |
| 0960    |               | 0960_QC401_220517 | 17/05/2022 | Field Blank        | EP2205925      |    |     |    |     |      |      |        |      |       |     |       |     |        |
| 0960    |               | 0960_QC401_220518 | 18/05/2022 | Field Blank        | EP2205970      |    |     |    |     |      |      |        |      |       |     |       |     |        |
| 0960    | SW001         | 0960_SW001_220518 | 18/05/2022 | Normal             | EP2205970      | <1 | 186 | <1 | 186 | 669  | 630  | 21,400 | 2.97 | 2,950 | 460 | 1,500 | 549 | 10,800 |
| 0960    | SW157         | 0960_SW157_220517 | 17/05/2022 | Normal             | EP2205925      | <1 | 68  | <1 | 68  | 71.6 | 64.6 | 2,280  | 5.16 | 284   | 76  | 116   | 64  | 1,140  |
| 0960    | SW170         | 0960_SW170_220517 | 17/05/2022 | Normal             | EP2205925      | <1 | 92  | <1 | 92  | 3.34 | 2.87 | 42     | 7.45 | 15    | 20  | 4     | 6   | 32     |
| 0960    | SW189         | 0960_SW189_220517 | 17/05/2022 | Normal             | EP2205925      | <1 | 65  | <1 | 65  | 40.1 | 35.7 | 1,260  | 5.80 | 155   | 47  | 68    | 40  | 614    |
| 0960    | SW190         | 0960_SW190_220517 | 17/05/2022 | Normal             | EP2205925      | <1 | 70  | <1 | 70  | 51.8 | 48.4 | 1,620  | 3.38 | 226   | 52  | 99    | 53  | 835    |
| 0960    | SW192         | 0960_SW192_220518 | 18/05/2022 | Normal             | EP2205970      | <1 | 113 | <1 | 113 | 458  | 398  | 14,700 | 6.94 | 1,970 | 303 | 953   | 359 | 6,800  |
| 0960    | SW193         | 0960_QC110_220518 | 18/05/2022 | Field Duplicate    | EP2205970      | <1 | 117 | <1 | 117 | 506  | 445  | 16,200 | 6.37 | 2,230 | 334 | 1,060 | 402 | 7,610  |
| 0960    | SW193         | 0960_QC210_220518 | 18/05/2022 | Interlab Duplicate | 890781         |    |     |    |     |      |      |        |      |       |     |       |     |        |
| 0960    | SW193         | 0960_SW193_220518 | 18/05/2022 | Normal             | EP2205970      | <1 | 116 | <1 | 116 | 506  | 446  | 16,200 | 6.34 | 2,260 | 330 | 1,060 | 404 | 7,630  |
| 0960    | SW205         | 0960_SW205_220517 | 17/05/2022 | Normal             | EP2205925      | <1 | 162 | <1 | 162 | 644  | 644  | 20,600 | 0.03 | 2,850 | 473 | 1,490 | 585 | 11,100 |
| 0960    | SW207         | 0960_SW207_220518 | 18/05/2022 | Normal             | EP2205970      | <1 | 111 | <1 | 111 | 616  | 554  | 19,800 | 5.29 | 2,670 | 408 | 1,300 | 488 | 9,530  |
| 0960    | SW208         | 0960_QC109_220517 | 17/05/2022 | Field Duplicate    | EP2205925      | <1 | 127 | <1 | 127 | 622  | 568  | 19,900 | 4.56 | 2,800 | 406 | 1,330 | 518 | 9,770  |
| 0960    | SW208         | 0960_QC209_220517 | 17/05/2022 | Interlab Duplicate | 890781         |    |     |    |     |      |      |        |      |       |     |       |     |        |
| 0960    | SW208         | 0960_SW208_220517 | 17/05/2022 | Normal             | EP2205925      | <1 | 126 | <1 | 126 | 616  | 614  | 19,700 | 0.19 | 2,790 | 438 | 1,420 | 555 | 10,600 |
| 0960    | SW209         | 0960_SW209_220518 | 18/05/2022 | Normal             | EP2205970      | <1 | 154 | <1 | 154 | 619  | 599  | 19,800 | 1.66 | 2,760 | 442 | 1,400 | 531 | 10,300 |
| 0960    | SW210         | 0960_SW210_220518 | 18/05/2022 | Normal             | EP2205970      | <1 | 188 | <1 | 188 | 610  | 611  | 19,400 | 0.10 | 2,810 | 467 | 1,420 | 543 | 10,500 |
| 0960    | SW211         | 0960_SW211_220518 | 18/05/2022 | Normal             | EP2205970      | <1 | 230 | <1 | 230 | 613  | 567  | 19,500 | 3.84 | 2,790 | 448 | 1,330 | 503 | 9,720  |
| 0960    | SW219         | 0960_SW219_220517 | 17/05/2022 | Normal             | EP2205925      | <1 | 98  | <1 | 98  | 2.17 | 1.98 | 6      | 4.45 | 2     | 14  | 3     | 10  | 18     |
| 0960    | SW265         | 0960_SW265_220517 | 17/05/2022 | Normal             | EP2205925      | <1 | 64  | <1 | 64  | 55.8 | 56.1 | 1,770  | 0.25 | 222   | 64  | 105   | 61  | 982    |
| 0960    | SW288         | 0960_SW288_220518 | 18/05/2022 | Normal             | EP2205970      | <1 | 127 | <1 | 127 | 594  | 580  | 19,000 | 1.24 | 2,680 | 414 | 1,350 | 524 | 9,990  |
| 0960    | SW298         | 0960_QC108_220517 | 17/05/2022 | Field Duplicate    | EP2205925      | <1 | 193 | <1 | 193 | 692  | 670  | 22,100 | 1.62 | 3,120 | 509 | 1,570 | 601 | 11,500 |
| 0960    | SW298         | 0960_QC208_220517 | 17/05/2022 | Interlab Duplicate | 890781         |    |     |    |     |      |      |        |      |       |     |       |     |        |
| 0960    | SW298         | 0960_SW298_220517 | 17/05/2022 | Normal             | EP2205925      | <1 | 191 | <1 | 191 | 695  | 670  | 22,200 | 1.82 | 3,120 | 509 | 1,570 | 599 | 11,500 |
| 0960    | SW300         | 0960_SW300_220518 | 18/05/2022 | Normal             | EP2205970      | <1 | 211 | <1 | 211 | 645  | 619  | 20,500 | 2.04 | 3,000 | 499 | 1,450 | 539 | 10,600 |
| 0960    | SW301         | 0960_SW301_220517 | 17/05/2022 | Normal             | EP2205925      | <1 | 182 | <1 | 182 | 672  | 632  | 21,500 | 2.99 | 2,950 | 474 | 1,460 | 572 | 10,900 |
| 0960    | SW302         | 0960_SW302_220518 | 18/05/2022 | Normal             | EP2205970      | <1 | 159 | <1 | 159 | 625  | 545  | 20,000 | 6.83 | 2,750 | 409 | 1,280 | 479 | 9,350  |
| 0960    | SW303         | 0960_SW303_220518 | 18/05/2022 | Normal             | EP2205970      | <1 | 157 | <1 | 157 | 624  | 563  | 20,000 | 5.08 | 2,700 | 420 | 1,330 | 494 | 9,660  |
| 0960    | SW304         | 0960_SW304_220518 | 18/05/2022 | Normal             | EP2205970      | <1 | 150 | <1 | 150 | 618  | 558  | 19,800 | 5.16 | 2,730 | 414 | 1,310 | 490 | 9,580  |
| 0960    | SW305         | 0960_SW305_220518 | 18/05/2022 | Normal             | EP2205970      | <1 | 150 | <1 | 150 | 610  | 578  | 19,500 | 2.68 | 2,720 | 430 | 1,360 | 506 | 9,920  |

Environmental Standards

HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%

HEPA, January 2020, PFAS NEMP 2020 Recreational Water

Env Stds Comments

\*Practical screening guideline of 0.01 µg/L based on typical current laboratory limit of reporting (HEPA, 2020)

Note:

First Time detect of PFOA or PFHxS+PFOS

New exceedance of guideline value

| ID   | Location Code | Field ID          | Date       | Sample Type        | Lab Report No. |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|------|---------------|-------------------|------------|--------------------|----------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| 0960 | SD199         | 0960_SD199_220517 | 17/05/2022 | Normal             | EP2205953      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SD200         | 0960_QC107_220517 | 17/05/2022 | Field Duplicate    | EP2205953      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SD200         | 0960_QC207_220517 | 17/05/2022 | Interlab Duplicate | 890781         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SD200         | 0960_SD200_220517 | 17/05/2022 | Normal             | EP2205953      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SD205         | 0960_SD205_220517 | 17/05/2022 | Normal             | EP2205953      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SD207         | 0960_SD207_220518 | 18/05/2022 | Normal             | EP2205969      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SD208         | 0960_SD208_220517 | 17/05/2022 | Normal             | EP2205953      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SD209         | 0960_SD209_220518 | 18/05/2022 | Normal             | EP2205969      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SD210         | 0960_SD210_220518 | 18/05/2022 | Normal             | EP2205969      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SD211         | 0960_SD211_220518 | 18/05/2022 | Normal             | EP2205969      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SD219         | 0960_SD219_220517 | 17/05/2022 | Normal             | EP2205953      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SD300         | 0960_SD300_220518 | 18/05/2022 | Normal             | EP2205969      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SD301         | 0060_SD301_220518 | 18/05/2022 | Normal             | EP2205969      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SD302         | 0960_SD302_220518 | 18/05/2022 | Normal             | EP2205969      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SD303         | 0960_SD303_220518 | 18/05/2022 | Normal             | EP2205969      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SD304         | 0960_SD304_220518 | 18/05/2022 | Normal             | EP2205969      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SD305         | 0960_SD305_220518 | 18/05/2022 | Normal             | EP2205969      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SS108         | 0960_SS108_220517 | 17/05/2022 | Normal             | EP2205953      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SS113         | 0960_SS113_220517 | 17/05/2022 | Normal             | EP2205953      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SS114         | 0960_SS114_220517 | 17/05/2022 | Normal             | EP2205953      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SS121         | 0960_SS121_220517 | 17/05/2022 | Normal             | EP2205953      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SS122         | 0960_QC105_220517 | 17/05/2022 | Field Duplicate    | EP2205953      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SS122         | 0960_QC205_220517 | 17/05/2022 | Interlab Duplicate | 890781         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SS122         | 0960_SS122_220517 | 17/05/2022 | Normal             | EP2205953      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SS123         | 0960_SS123_220517 | 17/05/2022 | Normal             | EP2205953      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SS124         | 0960_SS124_220517 | 17/05/2022 | Normal             | EP2205953      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SS125         | 0960_SS125_220517 | 17/05/2022 | Normal             | EP2205953      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SS157         | 0960_SS157_220517 | 17/05/2022 | Normal             | EP2205953      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SS166         | 0960_SS166_220517 | 17/05/2022 | Normal             | EP2205953      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SS168         | 0960_SS168_220517 | 17/05/2022 | Normal             | EP2205953      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SS170         | 0960_SS170_220517 | 17/05/2022 | Normal             | EP2205953      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SS174         | 0960_SS174_220517 | 17/05/2022 | Normal             | EP2205953      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SS176         | 0960_SS176_220517 | 17/05/2022 | Normal             | EP2206832      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SS189         | 0960_SS189_220517 | 17/05/2022 | Normal             | EP2205953      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SS190         | 0960_SS190_220517 | 17/05/2022 | Normal             | EP2205953      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SS192         | 0960_SS192_220518 | 18/05/2022 | Normal             | EP2205969      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SS193         | 0960_QC111_220518 | 18/05/2022 | Field Duplicate    | EP2205969      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SS193         | 0960_QC211_220518 | 18/05/2022 | Interlab Duplicate | 890781         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SS193         | 0960_SS193_220518 | 18/05/2022 | Normal             | EP2205969      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SS198         | 0960_QC112_220518 | 18/05/2022 | Field Duplicate    | EP2205969      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SS198         | 0960_QC212_220518 | 18/05/2022 | Interlab Duplicate | 890781         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SS198         | 0960_SS198_220518 | 18/05/2022 | Normal             | EP2205969      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SS227         | 0960_SS227_220517 | 17/05/2022 | Normal             | EP2205953      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SS231         | 0960_SS231_220517 | 17/05/2022 | Normal             | EP2205953      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SS234         | 0960_SS234_220517 | 17/05/2022 | Normal             | EP2205953      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SS235         | 0960_SS235_220517 | 17/05/2022 | Normal             | EP2205953      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SS243         | 0960_SS243_220517 | 17/05/2022 | Normal             | EP2205953      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SS265         | 0960_QC106_220517 | 17/05/2022 | Field Duplicate    | EP2205953      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SS265         | 0960_QC206_220517 | 17/05/2022 | Interlab Duplicate | 890781         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SS265         | 0960_SS265_220517 | 17/05/2022 | Normal             | EP2205953      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SS277         | 0960_SS277_220517 | 17/05/2022 | Normal             | EP2205953      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SS278         | 0960_SS278_220517 | 17/05/2022 | Normal             | EP2205953      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SS279         | 0960_SS279_220517 | 17/05/2022 | Normal             | EP2205953      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SS288         | 0960_SD288_220518 | 18/05/2022 | Normal             | EP2205969      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SS291         | 0960_SS291_220517 | 17/05/2022 | Normal             | EP2205953      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SS292         | 0960_SS292_220518 | 18/05/2022 | Normal             | EP2205969      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SS293         | 0960_SS293_220518 | 18/05/2022 | Normal             | EP2205969      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SS298         | 0960_SS298_220517 | 17/05/2022 | Normal             | EP2205953      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 0960 | SS301         | 0960_SS301_220517 | 17/05/2022 | Normal             | EP2205953      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

**Note:**

|                                         |
|-----------------------------------------|
| First Time detect of PFOA or PFHxS+PFOS |
| New exceedance of guideline value       |

[illegible]

**Note:**

|                                         |
|-----------------------------------------|
| First Time detect of PFOA or PFHxS+PFOS |
| New exceedance of guideline value       |



| Field ID<br>Matrix Type<br>Lab Report Number<br>Date      |      |      | 0960_SW298_220517 | 0960_QC108_220517 | RPD | 0960_SW298_220517 | 0960_QC208_220517 | RPD | 0960_SW208_220517 | 0960_QC109_220517 | RPD |
|-----------------------------------------------------------|------|------|-------------------|-------------------|-----|-------------------|-------------------|-----|-------------------|-------------------|-----|
|                                                           |      |      | Water             | Water             |     | Water             | Water             |     | Water             | Water             |     |
|                                                           |      |      | EP2205925         | EP2205925         |     | EP2205925         | 890781            |     | EP2205925         | EP2205925         |     |
|                                                           |      |      | 17/05/2022        | 17/05/2022        |     | 17/05/2022        | 17/05/2022        |     | 17/05/2022        | 17/05/2022        |     |
|                                                           | Unit | LOR  |                   |                   |     |                   |                   |     |                   |                   |     |
| PFAS - Perfluoroalkyl Sulfonic Acids                      |      |      |                   |                   |     |                   |                   |     |                   |                   |     |
| Perfluorobutane sulfonic acid (PFBS)                      | µg/L | 0.02 | <0.02             | <0.02             | 0   | <0.02             | <0.1              | 0   | <0.02             | <0.02             | 0   |
| Perfluoropentane sulfonic acid (PFPeS)                    | µg/L | 0.02 | <0.02             | <0.02             | 0   | <0.02             | <0.1              | 0   | <0.02             | <0.02             | 0   |
| Perfluorohexane sulfonic acid (PFHxS)                     | µg/L | 0.01 | <0.01             | <0.01             | 0   | <0.01             | <0.1              | 0   | <0.01             | <0.01             | 0   |
| Perfluoroheptane sulfonic acid (PFHpS)                    | µg/L | 0.02 | <0.02             | <0.02             | 0   | <0.02             | <0.2              | 0   | <0.02             | <0.02             | 0   |
| Perfluorooctane sulfonic acid (PFOS)                      | µg/L | 0.01 | <0.01             | <0.01             | 0   | <0.01             | <0.2              | 0   | <0.01             | <0.01             | 0   |
| Perfluorodecane sulfonic acid (PFDS)                      | µg/L | 0.02 | <0.02             | <0.02             | 0   | <0.02             | <0.2              | 0   | <0.02             | <0.02             | 0   |
| PFAS - Perfluoroalkyl Carboxylic Acids                    |      |      |                   |                   |     |                   |                   |     |                   |                   |     |
| Perfluorobutanoic acid (PFBA)                             | µg/L | 0.1  | <0.1              | <0.1              | 0   | <0.1              | <0.1              | 0   | <0.1              | <0.1              | 0   |
| Perfluoropentanoic acid (PFPeA)                           | µg/L | 0.02 | <0.02             | <0.02             | 0   | <0.02             | <0.05             | 0   | <0.02             | <0.02             | 0   |
| Perfluorohexanoic acid (PFHxA)                            | µg/L | 0.02 | <0.02             | <0.02             | 0   | <0.02             | <0.05             | 0   | <0.02             | <0.02             | 0   |
| Perfluoroheptanoic acid (PFHpA)                           | µg/L | 0.02 | <0.02             | <0.02             | 0   | <0.02             | <0.1              | 0   | <0.02             | <0.02             | 0   |
| Perfluorooctanoic acid (PFOA)                             | µg/L | 0.01 | <0.01             | <0.01             | 0   | <0.01             | <0.05             | 0   | <0.01             | <0.01             | 0   |
| Perfluorononanoic acid (PFNA)                             | µg/L | 0.02 | <0.02             | <0.02             | 0   | <0.02             | <0.05             | 0   | <0.02             | <0.02             | 0   |
| Perfluorodecanoic acid (PFDA)                             | µg/L | 0.02 | <0.02             | <0.02             | 0   | <0.02             | <0.05             | 0   | <0.02             | <0.02             | 0   |
| Perfluoroundecanoic acid (PFUnDA)                         | µg/L | 0.02 | <0.02             | <0.02             | 0   | <0.02             | <0.05             | 0   | <0.02             | <0.02             | 0   |
| Perfluorododecanoic acid (PFDoDA)                         | µg/L | 0.02 | <0.02             | <0.02             | 0   | <0.02             | <0.05             | 0   | <0.02             | <0.02             | 0   |
| Perfluorotridecanoic acid (PFTrDA)                        | µg/L | 0.02 | <0.02             | <0.02             | 0   | <0.02             | <0.05             | 0   | <0.02             | <0.02             | 0   |
| Perfluorotetradecanoic acid (PFTeDA)                      | µg/L | 0.05 | <0.05             | <0.05             | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.05             | 0   |
| PFAS - (n:2) Fluorotelomer Sulfonic Acids                 |      |      |                   |                   |     |                   |                   |     |                   |                   |     |
| 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | µg/L | 0.05 | <0.05             | <0.05             | 0   | <0.05             | <0.2              | 0   | <0.05             | <0.05             | 0   |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | µg/L | 0.05 | <0.05             | <0.05             | 0   | <0.05             | <0.2              | 0   | <0.05             | <0.05             | 0   |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | µg/L | 0.05 | <0.05             | <0.05             | 0   | <0.05             | <0.2              | 0   | <0.05             | <0.05             | 0   |
| 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | µg/L | 0.05 | <0.05             | <0.05             | 0   | <0.05             | <0.2              | 0   | <0.05             | <0.05             | 0   |
| PFAS - Perfluoroalkyl Sulfonamides                        |      |      |                   |                   |     |                   |                   |     |                   |                   |     |
| Perfluorooctane sulfonamide (FOSA)                        | µg/L | 0.02 | <0.02             | <0.02             | 0   | <0.02             | <0.2              | 0   | <0.02             | <0.02             | 0   |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)             | µg/L | 0.05 | <0.05             | <0.05             | 0   | <0.05             | <0.2              | 0   | <0.05             | <0.05             | 0   |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | µg/L | 0.02 | <0.02             | <0.02             | 0   | <0.02             | <0.2              | 0   | <0.02             | <0.02             | 0   |
| N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | µg/L | 0.05 | <0.05             | <0.05             | 0   | <0.05             | <0.2              | 0   | <0.05             | <0.05             | 0   |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | µg/L | 0.05 | <0.05             | <0.05             | 0   | <0.05             | <0.2              | 0   | <0.05             | <0.05             | 0   |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | µg/L | 0.02 | <0.02             | <0.02             | 0   | <0.02             | <0.2              | 0   | <0.02             | <0.02             | 0   |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | µg/L | 0.05 | <0.05             | <0.05             | 0   | <0.05             | <0.2              | 0   | <0.05             | <0.05             | 0   |
| Perfluorooctane sulfonamidoacetic acid (FOSAA)            | µg/L | 0.2  |                   |                   |     |                   | <0.2              |     |                   |                   |     |
| PFAS                                                      |      |      |                   |                   |     |                   |                   |     |                   |                   |     |
| Sum of PFHxS and PFOS                                     | µg/L | 0.01 | <0.01             | <0.01             | 0   | <0.01             | <0.1              | 0   | <0.01             | <0.01             | 0   |
| Sum of PFAS                                               | µg/L | 0.01 | <0.01             | <0.01             | 0   | <0.01             | <0.05             | 0   | <0.01             | <0.01             | 0   |
| Metals                                                    |      |      |                   |                   |     |                   |                   |     |                   |                   |     |
| Calcium (filtered)                                        | mg/L | 1    | 509               | 509               | 0   | 509               |                   |     | 438               | 406               | 8   |
| Magnesium (filtered)                                      | mg/L | 1    | 1,570             | 1,570             | 0   | 1,570             |                   |     | 1,420             | 1,330             | 7   |
| Potassium (filtered)                                      | mg/L | 1    | 599               | 601               | 0   | 599               |                   |     | 555               | 518               | 7   |
| Sodium (filtered)                                         | mg/L | 1    | 11,500            | 11,500            | 0   | 11,500            |                   |     | 10,600            | 9,770             | 8   |

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



|                                                           |      | 0960_SW208_220517 | 0960_QC209_220517 | RPD | 0960_SW193_220518 | 0960_QC110_220518 | RPD | 0960_SW193_220518 | 0960_QC210_220518 | RPD |
|-----------------------------------------------------------|------|-------------------|-------------------|-----|-------------------|-------------------|-----|-------------------|-------------------|-----|
|                                                           |      | Water             | Water             |     | Water             | Water             |     |                   |                   |     |
|                                                           |      | EP2205925         | 890781            |     | EP2205970         | EP2205970         |     |                   |                   |     |
|                                                           |      | 17/05/2022        | 17/05/2022        |     | 18/05/2022        | 18/05/2022        |     |                   |                   |     |
|                                                           | Unit |                   |                   |     |                   |                   |     |                   |                   |     |
| PFAS - Perfluoroalkyl Sulfonic Acids                      |      |                   |                   |     |                   |                   |     |                   |                   |     |
| Perfluorobutane sulfonic acid (PFBS)                      | µg/L | <0.02             | <0.1              | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.1              | 0   |
| Perfluoropentane sulfonic acid (PFPeS)                    | µg/L | <0.02             | <0.1              | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.1              | 0   |
| Perfluorohexane sulfonic acid (PFHxS)                     | µg/L | <0.01             | <0.1              | 0   | <0.01             | <0.01             | 0   | <0.01             | <0.1              | 0   |
| Perfluoroheptane sulfonic acid (PFHpS)                    | µg/L | <0.02             | <0.2              | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.2              | 0   |
| Perfluorooctane sulfonic acid (PFOS)                      | µg/L | <0.01             | <0.2              | 0   | 0.08              | 0.09              | 12  | 0.08              | <0.2              | 0   |
| Perfluorodecane sulfonic acid (PFDS)                      | µg/L | <0.02             | <0.2              | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.2              | 0   |
| PFAS - Perfluoroalkyl Carboxylic Acids                    |      |                   |                   |     |                   |                   |     |                   |                   |     |
| Perfluorobutanoic acid (PFBA)                             | µg/L | <0.1              | <0.1              | 0   | <0.1              | <0.1              | 0   | <0.1              | <0.1              | 0   |
| Perfluoropentanoic acid (PFPeA)                           | µg/L | <0.02             | <0.05             | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.05             | 0   |
| Perfluorohexanoic acid (PFHxA)                            | µg/L | <0.02             | <0.05             | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.05             | 0   |
| Perfluoroheptanoic acid (PFHpA)                           | µg/L | <0.02             | <0.1              | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.1              | 0   |
| Perfluorooctanoic acid (PFOA)                             | µg/L | <0.01             | <0.05             | 0   | <0.01             | <0.01             | 0   | <0.01             | <0.05             | 0   |
| Perfluorononanoic acid (PFNA)                             | µg/L | <0.02             | <0.05             | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.05             | 0   |
| Perfluorodecanoic acid (PFDA)                             | µg/L | <0.02             | <0.05             | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.05             | 0   |
| Perfluoroundecanoic acid (PFUnDA)                         | µg/L | <0.02             | <0.05             | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.05             | 0   |
| Perfluorododecanoic acid (PFDoDA)                         | µg/L | <0.02             | <0.05             | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.05             | 0   |
| Perfluorotridecanoic acid (PFTrDA)                        | µg/L | <0.02             | <0.05             | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.05             | 0   |
| Perfluorotetradecanoic acid (PFTeDA)                      | µg/L | <0.05             | <0.05             | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.05             | 0   |
| PFAS - (n:2) Fluorotelomer Sulfonic Acids                 |      |                   |                   |     |                   |                   |     |                   |                   |     |
| 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | µg/L | <0.05             | <0.2              | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.2              | 0   |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | µg/L | <0.05             | <0.2              | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.2              | 0   |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | µg/L | <0.05             | <0.2              | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.2              | 0   |
| 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | µg/L | <0.05             | <0.2              | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.2              | 0   |
| PFAS - Perfluoroalkyl Sulfonamides                        |      |                   |                   |     |                   |                   |     |                   |                   |     |
| Perfluorooctane sulfonamide (FOSA)                        | µg/L | <0.02             | <0.2              | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.2              | 0   |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)             | µg/L | <0.05             | <0.2              | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.2              | 0   |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | µg/L | <0.02             | <0.2              | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.2              | 0   |
| N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | µg/L | <0.05             | <0.2              | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.2              | 0   |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | µg/L | <0.05             | <0.2              | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.2              | 0   |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | µg/L | <0.02             | <0.2              | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.2              | 0   |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | µg/L | <0.05             | <0.2              | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.2              | 0   |
| Perfluorooctane sulfonamidoacetic acid (FOSAA)            | µg/L |                   | <0.2              |     |                   |                   |     |                   | <0.2              |     |
| PFAS                                                      |      |                   |                   |     |                   |                   |     |                   |                   |     |
| Sum of PFHxS and PFOS                                     | µg/L | <0.01             | <0.1              | 0   | 0.08              | 0.09              | 12  | 0.08              | <0.1              | 0   |
| Sum of PFAS                                               | µg/L | <0.01             | <0.05             | 0   | 0.08              | 0.09              | 12  | 0.08              | <0.05             | 46  |
| Metals                                                    |      |                   |                   |     |                   |                   |     |                   |                   |     |
| Calcium (filtered)                                        | mg/L | 438               |                   |     | 330               | 334               | 1   | 330               |                   |     |
| Magnesium (filtered)                                      | mg/L | 1,420             |                   |     | 1,060             | 1,060             | 0   | 1,060             |                   |     |
| Potassium (filtered)                                      | mg/L | 555               |                   |     | 404               | 402               | 0   | 404               |                   |     |
| Sodium (filtered)                                         | mg/L | 10,600            |                   |     | 7,630             | 7,610             | 0   | 7,630             |                   |     |

\*RPDs have only been considered where a concentration  
 \*\*Elevated RPDs are highlighted as per QAQC Profile sett  
 \*\*\*Interlab Duplicates are matched on a per compound l

| Field ID<br>Matrix Type<br>Lab Report Number<br>Date      |       |        | 0960_SS122_220517 |         | 0960_QC105_220517 |         | RPD     | 0960_SS122_220517 |         | 0960_QC205_220517 |    | RPD     | 0960_SS265_220517 |    | 0960_QC106_220517 |  | RPD |
|-----------------------------------------------------------|-------|--------|-------------------|---------|-------------------|---------|---------|-------------------|---------|-------------------|----|---------|-------------------|----|-------------------|--|-----|
|                                                           |       |        | Sediment          |         | Sediment          |         |         | Sediment          |         | Sediment          |    |         | Sediment          |    | Sediment          |  |     |
|                                                           |       |        | EP2205953         |         | EP2205953         |         |         | EP2205953         |         | 890781            |    |         | EP2205953         |    | EP2205953         |  |     |
|                                                           |       |        | 17/05/2022        |         | 17/05/2022        |         |         | 17/05/2022        |         | 17/05/2022        |    |         | 17/05/2022        |    | 17/05/2022        |  |     |
|                                                           | Unit  | LOR    |                   |         |                   |         |         |                   |         |                   |    |         |                   |    |                   |  |     |
| PFAS - Perfluoroalkyl Sulfonic Acids                      |       |        |                   |         |                   |         |         |                   |         |                   |    |         |                   |    |                   |  |     |
| Perfluorobutane sulfonic acid (PFBS)                      | mg/kg | 0.0002 | <0.0002           | <0.0002 | 0                 | <0.0002 | <0.0004 | 0                 | <0.0002 | <0.0002           | 0  | <0.0002 | <0.0002           | 0  |                   |  |     |
| Perfluoropentane sulfonic acid (PFPeS)                    | mg/kg | 0.0002 | <0.0002           | <0.0002 | 0                 | <0.0002 | <0.0004 | 0                 | <0.0002 | <0.0002           | 0  | <0.0002 | <0.0002           | 0  |                   |  |     |
| Perfluorohexane sulfonic acid (PFHxS)                     | mg/kg | 0.0002 | 0.0009            | 0.0008  | 12                | 0.0009  | 0.0006  | 40                | 0.0004  | 0.0004            | 0  | 0.0004  | 0.0004            | 0  |                   |  |     |
| Perfluoroheptane sulfonic acid (PFHpS)                    | mg/kg | 0.0002 | <0.0002           | <0.0002 | 0                 | <0.0002 | <0.0004 | 0                 | <0.0002 | <0.0002           | 0  | <0.0002 | <0.0002           | 0  |                   |  |     |
| Perfluorooctane sulfonic acid (PFOS)                      | mg/kg | 0.0002 | 0.0036            | 0.0042  | 15                | 0.0036  | 0.0026  | 32                | 0.0003  | 0.0008            | 91 | 0.0003  | 0.0008            | 91 |                   |  |     |
| Perfluorodecane sulfonic acid (PFDS)                      | mg/kg | 0.0002 | <0.0002           | <0.0002 | 0                 | <0.0002 | <0.0004 | 0                 | <0.0002 | <0.0002           | 0  | <0.0002 | <0.0002           | 0  |                   |  |     |
| PFAS - Perfluoroalkyl Carboxylic Acids                    |       |        |                   |         |                   |         |         |                   |         |                   |    |         |                   |    |                   |  |     |
| Perfluorobutanoic acid (PFBA)                             | mg/kg | 0.0008 | <0.001            | <0.001  | 0                 | <0.001  | <0.0008 | 0                 | <0.001  | <0.001            | 0  | <0.001  | <0.001            | 0  |                   |  |     |
| Perfluoropentanoic acid (PFPeA)                           | mg/kg | 0.0002 | <0.0002           | <0.0002 | 0                 | <0.0002 | <0.0002 | 0                 | <0.0002 | <0.0002           | 0  | <0.0002 | <0.0002           | 0  |                   |  |     |
| Perfluorohexanoic acid (PFHxA)                            | mg/kg | 0.0002 | 0.0003            | 0.0004  | 29                | 0.0003  | <0.0004 | 0                 | <0.0002 | <0.0002           | 0  | <0.0002 | <0.0002           | 0  |                   |  |     |
| Perfluoroheptanoic acid (PFHpA)                           | mg/kg | 0.0002 | <0.0002           | <0.0002 | 0                 | <0.0002 | <0.0008 | 0                 | <0.0002 | <0.0002           | 0  | <0.0002 | <0.0002           | 0  |                   |  |     |
| Perfluorooctanoic acid (PFOA)                             | mg/kg | 0.0002 | <0.0002           | <0.0002 | 0                 | <0.0002 | <0.0002 | 0                 | <0.0002 | <0.0002           | 0  | <0.0002 | <0.0002           | 0  |                   |  |     |
| Perfluorononanoic acid (PFNA)                             | mg/kg | 0.0002 | <0.0002           | <0.0002 | 0                 | <0.0002 | <0.0002 | 0                 | <0.0002 | <0.0002           | 0  | <0.0002 | <0.0002           | 0  |                   |  |     |
| Perfluorodecanoic acid (PFDA)                             | mg/kg | 0.0002 | <0.0002           | <0.0002 | 0                 | <0.0002 | <0.0002 | 0                 | <0.0002 | <0.0002           | 0  | <0.0002 | <0.0002           | 0  |                   |  |     |
| Perfluoroundecanoic acid (PFUnDA)                         | mg/kg | 0.0002 | <0.0002           | <0.0002 | 0                 | <0.0002 | <0.0002 | 0                 | <0.0002 | <0.0002           | 0  | <0.0002 | <0.0002           | 0  |                   |  |     |
| Perfluorododecanoic acid (PFDoDA)                         | mg/kg | 0.0002 | <0.0002           | <0.0002 | 0                 | <0.0002 | <0.0002 | 0                 | <0.0002 | <0.0002           | 0  | <0.0002 | <0.0002           | 0  |                   |  |     |
| Perfluorotridecanoic acid (PFTTrDA)                       | mg/kg | 0.0002 | <0.0002           | <0.0002 | 0                 | <0.0002 | <0.0002 | 0                 | <0.0002 | <0.0002           | 0  | <0.0002 | <0.0002           | 0  |                   |  |     |
| Perfluorotetradecanoic acid (PFTeDA)                      | mg/kg | 0.0002 | <0.0005           | <0.0005 | 0                 | <0.0005 | <0.0002 | 0                 | <0.0005 | <0.0005           | 0  | <0.0005 | <0.0005           | 0  |                   |  |     |
| PFAS - (n:2) Fluorotelomer Sulfonic Acids                 |       |        |                   |         |                   |         |         |                   |         |                   |    |         |                   |    |                   |  |     |
| 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | mg/kg | 0.0005 | <0.0005           | <0.0005 | 0                 | <0.0005 | <0.0005 | 0                 | <0.0005 | <0.0005           | 0  | <0.0005 | <0.0005           | 0  |                   |  |     |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | mg/kg | 0.0005 | <0.0005           | <0.0005 | 0                 | <0.0005 | 0.0007  | 33                | <0.0005 | <0.0005           | 0  | <0.0005 | <0.0005           | 0  |                   |  |     |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | mg/kg | 0.0005 | <0.0005           | <0.0005 | 0                 | <0.0005 | <0.0005 | 0                 | <0.0005 | <0.0005           | 0  | <0.0005 | <0.0005           | 0  |                   |  |     |
| 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | mg/kg | 0.0005 | <0.0005           | <0.0005 | 0                 | <0.0005 | <0.0005 | 0                 | <0.0005 | <0.0005           | 0  | <0.0005 | <0.0005           | 0  |                   |  |     |
| PFAS - Perfluoroalkyl Sulfonamides                        |       |        |                   |         |                   |         |         |                   |         |                   |    |         |                   |    |                   |  |     |
| Perfluorooctane sulfonamide (FOSA)                        | mg/kg | 0.0002 | <0.0002           | <0.0002 | 0                 | <0.0002 | <0.0004 | 0                 | <0.0002 | <0.0002           | 0  | <0.0002 | <0.0002           | 0  |                   |  |     |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)             | mg/kg | 0.0004 | <0.0005           | <0.0005 | 0                 | <0.0005 | <0.0004 | 0                 | <0.0005 | <0.0005           | 0  | <0.0005 | <0.0005           | 0  |                   |  |     |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | mg/kg | 0.0002 | <0.0002           | <0.0002 | 0                 | <0.0002 | <0.0004 | 0                 | <0.0002 | <0.0002           | 0  | <0.0002 | <0.0002           | 0  |                   |  |     |
| N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | mg/kg | 0.0005 | <0.0005           | <0.0005 | 0                 | <0.0005 | <0.0008 | 0                 | <0.0005 | <0.0005           | 0  | <0.0005 | <0.0005           | 0  |                   |  |     |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | mg/kg | 0.0004 | <0.0005           | <0.0005 | 0                 | <0.0005 | <0.0004 | 0                 | <0.0005 | <0.0005           | 0  | <0.0005 | <0.0005           | 0  |                   |  |     |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | mg/kg | 0.0002 | <0.0002           | <0.0002 | 0                 | <0.0002 | <0.0004 | 0                 | <0.0002 | <0.0002           | 0  | <0.0002 | <0.0002           | 0  |                   |  |     |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | mg/kg | 0.0005 | <0.0005           | <0.0005 | 0                 | <0.0005 | <0.0008 | 0                 | <0.0005 | <0.0005           | 0  | <0.0005 | <0.0005           | 0  |                   |  |     |
| Perfluorooctane sulfonamidoacetic acid (FOSAA)            | mg/kg | 0.0004 |                   |         |                   |         | <0.0004 |                   |         |                   |    |         |                   |    |                   |  |     |
| PFAS                                                      |       |        |                   |         |                   |         |         |                   |         |                   |    |         |                   |    |                   |  |     |
| Sum of PFHxS and PFOS                                     | mg/kg | 0.0002 | 0.0045            | 0.0050  | 11                | 0.0045  | 0.0033  | 31                | 0.0007  | 0.0012            | 53 | 0.0007  | 0.0012            | 53 |                   |  |     |
| Sum of PFAS                                               | mg/kg | 0.0002 | 0.0048            | 0.0054  | 12                | 0.0048  | 0.0040  | 18                | 0.0007  | 0.0012            | 53 | 0.0007  | 0.0012            | 53 |                   |  |     |

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

\*\*Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each LOR multiplier range are: No Limit (1 - 10 x LOR); 50 (10 - 20 x LOR); 20 (> 20 x LOR) )

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

| Field ID<br>Matrix Type<br>Lab Report Number<br>Date        |       |        | 0960_SS265_220517 | 0960_QC206_220517 | RPD | 0960_SD200_220517 | 0960_QC107_220517 | RPD | 0960_SD200_220517 | 0960_QC207_220517 | RPD |
|-------------------------------------------------------------|-------|--------|-------------------|-------------------|-----|-------------------|-------------------|-----|-------------------|-------------------|-----|
|                                                             |       |        | Sediment          | Sediment          |     | Sediment          | Sediment          |     |                   |                   |     |
|                                                             |       |        | EP2205953         | 890781            |     | EP2205953         | 890781            |     |                   |                   |     |
|                                                             |       |        | 17/05/2022        | 17/05/2022        |     | 17/05/2022        | 17/05/2022        |     |                   |                   |     |
|                                                             | Unit  | LOR    |                   |                   |     |                   |                   |     |                   |                   |     |
| PFAS - Perfluoroalkyl Sulfonic Acids                        |       |        |                   |                   |     |                   |                   |     |                   |                   |     |
| Perfluorobutane sulfonic acid (PFBS)                        | mg/kg | 0.0002 | <0.0002           | <0.0004           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   |
| Perfluoropentane sulfonic acid (PFPeS)                      | mg/kg | 0.0002 | <0.0002           | <0.0004           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   |
| Perfluorohexane sulfonic acid (PFHxS)                       | mg/kg | 0.0002 | 0.0004            | <0.0004           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   |
| Perfluoroheptane sulfonic acid (PFHpS)                      | mg/kg | 0.0002 | <0.0002           | <0.0004           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   |
| Perfluorooctane sulfonic acid (PFOS)                        | mg/kg | 0.0002 | 0.0003            | <0.0004           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   |
| Perfluorodecane sulfonic acid (PFDS)                        | mg/kg | 0.0002 | <0.0002           | <0.0004           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   |
| PFAS - Perfluoroalkyl Carboxylic Acids                      |       |        |                   |                   |     |                   |                   |     |                   |                   |     |
| Perfluorobutanoic acid (PFBA)                               | mg/kg | 0.0008 | <0.001            | <0.0008           | 0   | <0.001            | <0.001            | 0   | <0.001            | <0.0008           | 0   |
| Perfluoropentanoic acid (PFPeA)                             | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   |
| Perfluorohexanoic acid (PFHxA)                              | mg/kg | 0.0002 | <0.0002           | <0.0004           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   |
| Perfluoroheptanoic acid (PFHpA)                             | mg/kg | 0.0002 | <0.0002           | <0.0008           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0008           | 0   |
| Perfluorooctanoic acid (PFOA)                               | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   |
| Perfluorononanoic acid (PFNA)                               | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   |
| Perfluorodecanoic acid (PFDA)                               | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   |
| Perfluoroundecanoic acid (PFUnDA)                           | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   |
| Perfluorododecanoic acid (PFDoDA)                           | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   |
| Perfluorotridecanoic acid (PFTrDA)                          | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   |
| Perfluorotetradecanoic acid (PFTeDA)                        | mg/kg | 0.0002 | <0.0005           | <0.0002           | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0002           | 0   |
| PFAS - (n:2) Fluorotelomer Sulfonic Acids                   |       |        |                   |                   |     |                   |                   |     |                   |                   |     |
| 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                   | mg/kg | 0.0005 | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0005           | 0   |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                   | mg/kg | 0.0005 | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0005           | 0   |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                   | mg/kg | 0.0005 | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0005           | 0   |
| 10:2 Fluorotelomer sulfonic acid (10:2 FTS)                 | mg/kg | 0.0005 | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0005           | 0   |
| PFAS - Perfluoroalkyl Sulfonylamides                        |       |        |                   |                   |     |                   |                   |     |                   |                   |     |
| Perfluorooctane sulfonylamide (FOSA)                        | mg/kg | 0.0002 | <0.0002           | <0.0004           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   |
| N-Methyl perfluorooctane sulfonylamide (MeFOSA)             | mg/kg | 0.0004 | <0.0005           | <0.0004           | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0004           | 0   |
| N-Methyl perfluorooctane sulfonylamidoacetic acid (MeFOSAA) | mg/kg | 0.0002 | <0.0002           | <0.0004           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   |
| N-methyl perfluorooctane sulfonylamidoethanol (MeFOSE)      | mg/kg | 0.0005 | <0.0005           | <0.0008           | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0008           | 0   |
| N-Ethyl perfluorooctane sulfonylamide (EtFOSA)              | mg/kg | 0.0004 | <0.0005           | <0.0004           | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0004           | 0   |
| N-Ethyl perfluorooctane sulfonylamidoacetic acid (EtFOSAA)  | mg/kg | 0.0002 | <0.0002           | <0.0004           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   |
| N-Ethyl perfluorooctane sulfonylamidoethanol (EtFOSE)       | mg/kg | 0.0005 | <0.0005           | <0.0008           | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0008           | 0   |
| Perfluorooctane sulfonylamidoacetic acid (FOSAA)            | mg/kg | 0.0004 |                   | <0.0004           |     |                   |                   |     |                   | <0.0004           |     |
| PFAS                                                        |       |        |                   |                   |     |                   |                   |     |                   |                   |     |
| Sum of PFHxS and PFOS                                       | mg/kg | 0.0002 | 0.0007            | <0.0004           | 55  | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   |
| Sum of PFAS                                                 | mg/kg | 0.0002 | 0.0007            | <0.0002           | 111 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   |

| Field ID<br>Matrix Type<br>Lab Report Number<br>Date        |       |        | 0960_SS193_220518 |         | 0960_QC111_220518 |         | RPD     | 0960_SS193_220518 |         | 0960_QC211_220518 |   | RPD     | 0960_SS198_220518 |   | 0960_QC112_220518 |         | RPD |
|-------------------------------------------------------------|-------|--------|-------------------|---------|-------------------|---------|---------|-------------------|---------|-------------------|---|---------|-------------------|---|-------------------|---------|-----|
|                                                             |       |        | Sediment          |         | Sediment          |         |         | Sediment          |         | Sediment          |   |         | Sediment          |   | Sediment          |         |     |
|                                                             |       |        | EP2205969         |         | EP2205969         |         |         | EP2205969         |         | 890781            |   |         | EP2205969         |   | EP2205969         |         |     |
|                                                             |       |        | 18/05/2022        |         | 18/05/2022        |         |         | 18/05/2022        |         | 18/05/2022        |   |         | 18/05/2022        |   | 18/05/2022        |         |     |
|                                                             | Unit  | LOR    |                   |         |                   |         |         |                   |         |                   |   |         |                   |   |                   |         |     |
| PFAS - Perfluoroalkyl Sulfonic Acids                        |       |        |                   |         |                   |         |         |                   |         |                   |   |         |                   |   |                   |         |     |
| Perfluorobutane sulfonic acid (PFBS)                        | mg/kg | 0.0002 | <0.0002           | <0.0002 | 0                 | <0.0002 | <0.0004 | 0                 | <0.0002 | <0.0002           | 0 | <0.0002 | <0.0002           | 0 | <0.0002           | <0.0002 |     |
| Perfluoropentane sulfonic acid (PFPeS)                      | mg/kg | 0.0002 | <0.0002           | <0.0002 | 0                 | <0.0002 | <0.0004 | 0                 | <0.0002 | <0.0002           | 0 | <0.0002 | <0.0002           | 0 | <0.0002           | <0.0002 |     |
| Perfluorohexane sulfonic acid (PFHxS)                       | mg/kg | 0.0002 | <0.0002           | <0.0002 | 0                 | <0.0002 | <0.0004 | 0                 | <0.0002 | <0.0002           | 0 | <0.0002 | <0.0002           | 0 | <0.0002           | <0.0002 |     |
| Perfluoroheptane sulfonic acid (PFHpS)                      | mg/kg | 0.0002 | <0.0002           | <0.0002 | 0                 | <0.0002 | <0.0004 | 0                 | <0.0002 | <0.0002           | 0 | <0.0002 | <0.0002           | 0 | <0.0002           | <0.0002 |     |
| Perfluorooctane sulfonic acid (PFOS)                        | mg/kg | 0.0002 | 0.0002            | 0.0004  | 67                | 0.0002  | <0.0004 | 0                 | 0.0031  | 0.0030            | 3 | 0.0031  | 0.0030            | 3 | 0.0031            | 0.0030  |     |
| Perfluorodecane sulfonic acid (PFDS)                        | mg/kg | 0.0002 | <0.0002           | <0.0002 | 0                 | <0.0002 | <0.0004 | 0                 | <0.0002 | <0.0002           | 0 | <0.0002 | <0.0002           | 0 | <0.0002           | <0.0002 |     |
| PFAS - Perfluoroalkyl Carboxylic Acids                      |       |        |                   |         |                   |         |         |                   |         |                   |   |         |                   |   |                   |         |     |
| Perfluorobutanoic acid (PFBA)                               | mg/kg | 0.0008 | <0.001            | <0.001  | 0                 | <0.001  | <0.0008 | 0                 | <0.001  | <0.001            | 0 | <0.001  | <0.001            | 0 | <0.001            | <0.001  |     |
| Perfluoropentanoic acid (PFPeA)                             | mg/kg | 0.0002 | <0.0002           | <0.0002 | 0                 | <0.0002 | <0.0002 | 0                 | <0.0002 | <0.0002           | 0 | <0.0002 | <0.0002           | 0 | <0.0002           | <0.0002 |     |
| Perfluorohexanoic acid (PFHxA)                              | mg/kg | 0.0002 | <0.0002           | <0.0002 | 0                 | <0.0002 | <0.0004 | 0                 | <0.0002 | <0.0002           | 0 | <0.0002 | <0.0002           | 0 | <0.0002           | <0.0002 |     |
| Perfluoroheptanoic acid (PFHpA)                             | mg/kg | 0.0002 | <0.0002           | <0.0002 | 0                 | <0.0002 | <0.0008 | 0                 | <0.0002 | <0.0002           | 0 | <0.0002 | <0.0002           | 0 | <0.0002           | <0.0002 |     |
| Perfluorooctanoic acid (PFOA)                               | mg/kg | 0.0002 | <0.0002           | <0.0002 | 0                 | <0.0002 | <0.0002 | 0                 | <0.0002 | <0.0002           | 0 | <0.0002 | <0.0002           | 0 | <0.0002           | <0.0002 |     |
| Perfluorononanoic acid (PFNA)                               | mg/kg | 0.0002 | <0.0002           | <0.0002 | 0                 | <0.0002 | <0.0002 | 0                 | <0.0002 | <0.0002           | 0 | <0.0002 | <0.0002           | 0 | <0.0002           | <0.0002 |     |
| Perfluorodecanoic acid (PFDA)                               | mg/kg | 0.0002 | <0.0002           | <0.0002 | 0                 | <0.0002 | <0.0002 | 0                 | <0.0002 | <0.0002           | 0 | <0.0002 | <0.0002           | 0 | <0.0002           | <0.0002 |     |
| Perfluoroundecanoic acid (PFUnDA)                           | mg/kg | 0.0002 | <0.0002           | <0.0002 | 0                 | <0.0002 | <0.0002 | 0                 | <0.0002 | <0.0002           | 0 | <0.0002 | <0.0002           | 0 | <0.0002           | <0.0002 |     |
| Perfluorododecanoic acid (PFDoDA)                           | mg/kg | 0.0002 | <0.0002           | <0.0002 | 0                 | <0.0002 | <0.0002 | 0                 | <0.0002 | <0.0002           | 0 | <0.0002 | <0.0002           | 0 | <0.0002           | <0.0002 |     |
| Perfluorotridecanoic acid (PFTrDA)                          | mg/kg | 0.0002 | <0.0002           | <0.0002 | 0                 | <0.0002 | <0.0002 | 0                 | <0.0002 | <0.0002           | 0 | <0.0002 | <0.0002           | 0 | <0.0002           | <0.0002 |     |
| Perfluorotetradecanoic acid (PFTeDA)                        | mg/kg | 0.0002 | <0.0005           | <0.0005 | 0                 | <0.0005 | <0.0002 | 0                 | <0.0005 | <0.0005           | 0 | <0.0005 | <0.0005           | 0 | <0.0005           | <0.0005 |     |
| PFAS - (n:2) Fluorotelomer Sulfonic Acids                   |       |        |                   |         |                   |         |         |                   |         |                   |   |         |                   |   |                   |         |     |
| 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                   | mg/kg | 0.0005 | <0.0005           | <0.0005 | 0                 | <0.0005 | <0.0005 | 0                 | <0.0005 | <0.0005           | 0 | <0.0005 | <0.0005           | 0 | <0.0005           | <0.0005 |     |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                   | mg/kg | 0.0005 | <0.0005           | <0.0005 | 0                 | <0.0005 | <0.0005 | 0                 | <0.0005 | <0.0005           | 0 | <0.0005 | <0.0005           | 0 | <0.0005           | <0.0005 |     |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                   | mg/kg | 0.0005 | <0.0005           | <0.0005 | 0                 | <0.0005 | <0.0005 | 0                 | <0.0005 | <0.0005           | 0 | <0.0005 | <0.0005           | 0 | <0.0005           | <0.0005 |     |
| 10:2 Fluorotelomer sulfonic acid (10:2 FTS)                 | mg/kg | 0.0005 | <0.0005           | <0.0005 | 0                 | <0.0005 | <0.0005 | 0                 | <0.0005 | <0.0005           | 0 | <0.0005 | <0.0005           | 0 | <0.0005           | <0.0005 |     |
| PFAS - Perfluoroalkyl Sulfonylamides                        |       |        |                   |         |                   |         |         |                   |         |                   |   |         |                   |   |                   |         |     |
| Perfluorooctane sulfonylamide (FOSA)                        | mg/kg | 0.0002 | <0.0002           | <0.0002 | 0                 | <0.0002 | <0.0004 | 0                 | <0.0002 | <0.0002           | 0 | <0.0002 | <0.0002           | 0 | <0.0002           | <0.0002 |     |
| N-Methyl perfluorooctane sulfonylamide (MeFOSA)             | mg/kg | 0.0004 | <0.0005           | <0.0005 | 0                 | <0.0005 | <0.0004 | 0                 | <0.0005 | <0.0005           | 0 | <0.0005 | <0.0005           | 0 | <0.0005           | <0.0005 |     |
| N-Methyl perfluorooctane sulfonylamidoacetic acid (MeFOSAA) | mg/kg | 0.0002 | <0.0002           | <0.0002 | 0                 | <0.0002 | <0.0004 | 0                 | <0.0002 | <0.0002           | 0 | <0.0002 | <0.0002           | 0 | <0.0002           | <0.0002 |     |
| N-methyl perfluorooctane sulfonylamidoethanol (MeFOSE)      | mg/kg | 0.0005 | <0.0005           | <0.0005 | 0                 | <0.0005 | <0.0008 | 0                 | <0.0005 | <0.0005           | 0 | <0.0005 | <0.0005           | 0 | <0.0005           | <0.0005 |     |
| N-Ethyl perfluorooctane sulfonylamide (EtFOSA)              | mg/kg | 0.0004 | <0.0005           | <0.0005 | 0                 | <0.0005 | <0.0004 | 0                 | <0.0005 | <0.0005           | 0 | <0.0005 | <0.0005           | 0 | <0.0005           | <0.0005 |     |
| N-Ethyl perfluorooctane sulfonylamidoacetic acid (EtFOSAA)  | mg/kg | 0.0002 | <0.0002           | <0.0002 | 0                 | <0.0002 | <0.0004 | 0                 | <0.0002 | <0.0002           | 0 | <0.0002 | <0.0002           | 0 | <0.0002           | <0.0002 |     |
| N-Ethyl perfluorooctane sulfonylamidoethanol (EtFOSE)       | mg/kg | 0.0005 | <0.0005           | <0.0005 | 0                 | <0.0005 | <0.0008 | 0                 | <0.0005 | <0.0005           | 0 | <0.0005 | <0.0005           | 0 | <0.0005           | <0.0005 |     |
| Perfluorooctane sulfonylamidoacetic acid (FOSAA)            | mg/kg | 0.0004 |                   |         |                   |         | <0.0004 |                   |         |                   |   |         |                   |   |                   |         |     |
| PFAS                                                        |       |        |                   |         |                   |         |         |                   |         |                   |   |         |                   |   |                   |         |     |
| Sum of PFHxS and PFOS                                       | mg/kg | 0.0002 | 0.0002            | 0.0004  | 67                | 0.0002  | <0.0004 | 0                 | 0.0031  | 0.0030            | 3 | 0.0031  | 0.0030            | 3 | 0.0031            | 0.0030  |     |
| Sum of PFAS                                                 | mg/kg | 0.0002 | 0.0002            | 0.0004  | 67                | 0.0002  | <0.0002 | 0                 | 0.0031  | 0.0030            | 3 | 0.0031  | 0.0030            | 3 | 0.0031            | 0.0030  |     |

| Field ID<br>Matrix Type<br>Lab Report Number<br>Date        |       |        | 0960_SS198_220518 | 0960_QC212_220518 | RPD |
|-------------------------------------------------------------|-------|--------|-------------------|-------------------|-----|
|                                                             |       |        | Sediment          | Sediment          |     |
|                                                             |       |        | EP2205969         | 890781            |     |
|                                                             |       |        | 18/05/2022        | 18/05/2022        |     |
|                                                             | Unit  | LOR    |                   |                   |     |
| PFAS - Perfluoroalkyl Sulfonic Acids                        |       |        |                   |                   |     |
| Perfluorobutane sulfonic acid (PFBS)                        | mg/kg | 0.0002 | <0.0002           | <0.0004           | 0   |
| Perfluoropentane sulfonic acid (PFPeS)                      | mg/kg | 0.0002 | <0.0002           | <0.0004           | 0   |
| Perfluorohexane sulfonic acid (PFHxS)                       | mg/kg | 0.0002 | <0.0002           | <0.0004           | 0   |
| Perfluoroheptane sulfonic acid (PFHpS)                      | mg/kg | 0.0002 | <0.0002           | <0.0004           | 0   |
| Perfluorooctane sulfonic acid (PFOS)                        | mg/kg | 0.0002 | 0.0031            | <0.0004           | 154 |
| Perfluorodecane sulfonic acid (PFDS)                        | mg/kg | 0.0002 | <0.0002           | <0.0004           | 0   |
| PFAS - Perfluoroalkyl Carboxylic Acids                      |       |        |                   |                   |     |
| Perfluorobutanoic acid (PFBA)                               | mg/kg | 0.0008 | <0.001            | <0.0008           | 0   |
| Perfluoropentanoic acid (PFPeA)                             | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   |
| Perfluorohexanoic acid (PFHxA)                              | mg/kg | 0.0002 | <0.0002           | <0.0004           | 0   |
| Perfluoroheptanoic acid (PFHpA)                             | mg/kg | 0.0002 | <0.0002           | <0.0008           | 0   |
| Perfluorooctanoic acid (PFOA)                               | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   |
| Perfluorononanoic acid (PFNA)                               | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   |
| Perfluorodecanoic acid (PFDA)                               | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   |
| Perfluoroundecanoic acid (PFUnDA)                           | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   |
| Perfluorododecanoic acid (PFDoDA)                           | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   |
| Perfluorotridecanoic acid (PFTrDA)                          | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   |
| Perfluorotetradecanoic acid (PFTeDA)                        | mg/kg | 0.0002 | <0.0005           | <0.0002           | 0   |
| PFAS - (n:2) Fluorotelomer Sulfonic Acids                   |       |        |                   |                   |     |
| 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                   | mg/kg | 0.0005 | <0.0005           | <0.0005           | 0   |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                   | mg/kg | 0.0005 | <0.0005           | <0.0005           | 0   |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                   | mg/kg | 0.0005 | <0.0005           | <0.0005           | 0   |
| 10:2 Fluorotelomer sulfonic acid (10:2 FTS)                 | mg/kg | 0.0005 | <0.0005           | <0.0005           | 0   |
| PFAS - Perfluoroalkyl Sulfonylamides                        |       |        |                   |                   |     |
| Perfluorooctane sulfonylamide (FOSA)                        | mg/kg | 0.0002 | <0.0002           | <0.0004           | 0   |
| N-Methyl perfluorooctane sulfonylamide (MeFOSA)             | mg/kg | 0.0004 | <0.0005           | <0.0004           | 0   |
| N-Methyl perfluorooctane sulfonylamidoacetic acid (MeFOSAA) | mg/kg | 0.0002 | <0.0002           | <0.0004           | 0   |
| N-methyl perfluorooctane sulfonylamidoethanol (MeFOSE)      | mg/kg | 0.0005 | <0.0005           | <0.0008           | 0   |
| N-Ethyl perfluorooctane sulfonylamide (EtFOSA)              | mg/kg | 0.0004 | <0.0005           | <0.0004           | 0   |
| N-Ethyl perfluorooctane sulfonylamidoacetic acid (EtFOSAA)  | mg/kg | 0.0002 | <0.0002           | <0.0004           | 0   |
| N-Ethyl perfluorooctane sulfonylamidoethanol (EtFOSE)       | mg/kg | 0.0005 | <0.0005           | <0.0008           | 0   |
| Perfluorooctane sulfonylamidoacetic acid (FOSAA)            | mg/kg | 0.0004 |                   | <0.0004           |     |
| PFAS                                                        |       |        |                   |                   |     |
| Sum of PFHxS and PFOS                                       | mg/kg | 0.0002 | 0.0031            | <0.0004           | 154 |
| Sum of PFAS                                                 | mg/kg | 0.0002 | 0.0031            | <0.0002           | 176 |

APPENDIX

C

LABORATORY CERTIFICATES





# CHAIN OF CUSTODY

COC#: 37683

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: DEF19009/Learmonth SW - MBMG

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:  
/ ES2019CARBSD0002

## SAMPLE DETAILS

## ANALYSIS REQUIRED

| SAMPLE | NAME       | DESCRIPTION | DATE / TIME         | MATRIX | TOTAL BOTTLES        | ON HOLD | Rinse WATER | Surface Waters Primary WATER | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION        |
|--------|------------|-------------|---------------------|--------|----------------------|---------|-------------|------------------------------|----------------------|-------------------------------|
| 001    | 0960_SW265 |             | 17/05/2022 09:36 AM | Water  | ALS: 5<br>Non ALS: 0 | No      |             | Partial 4/8                  |                      | extra PFAS bottles for lab QC |
| 002    | 0960_SW170 |             | 17/05/2022 09:50 AM | Water  | ALS: 3<br>Non ALS: 0 | No      |             | Partial 4/8                  |                      |                               |
| 003    | 0960_SW189 |             | 17/05/2022 11:01 AM | Water  | ALS: 3<br>Non ALS: 0 | No      |             | Partial 4/8                  |                      |                               |
| 004    | 0960_SW190 |             | 17/05/2022 11:11 AM | Water  | ALS: 3<br>Non ALS: 0 | No      |             | Partial 4/8                  |                      |                               |
| 005    | 0960_SW157 |             | 17/05/2022 12:21 PM | Water  | ALS: 3<br>Non ALS: 0 | No      |             | Partial 4/8                  |                      |                               |
| 006    | 0960_SW219 |             | 17/05/2022 01:26 PM | Water  | ALS: 3<br>Non ALS: 0 | No      |             | Partial 4/8                  |                      |                               |
| 007    | 0960_SW298 |             | 17/05/2022 02:08 PM | Water  | ALS: 3<br>Non ALS: 0 | No      |             | Partial 4/8                  |                      |                               |
| 008    | 0960_QC108 |             | 17/05/2022 02:10 PM | Water  | ALS: 3<br>Non ALS: 0 | No      |             | Partial 4/8                  |                      |                               |
| 009    | 0960_SW301 |             | 17/05/2022 02:28 PM | Water  | ALS: 3<br>Non ALS: 0 | No      |             | Partial 4/8                  |                      |                               |



# CHAIN OF CUSTODY

COC#: 37683

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: DEF19009/Learmonth SW - MBMG

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:  
/ ES2019CARBSD0002

## SAMPLE DETAILS

## ANALYSIS REQUIRED

| SAMPLE | NAME       | DESCRIPTION | DATE / TIME         | MATRIX | TOTAL BOTTLES        | ON HOLD | Rinsate WATER | Surface Waters Primary WATER | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|------------|-------------|---------------------|--------|----------------------|---------|---------------|------------------------------|----------------------|------------------------|
| 010    | 0960_SW205 |             | 17/05/2022 02:46 PM | Water  | ALS: 3<br>Non ALS: 0 | No      |               | Partial 4/8                  |                      |                        |
| 011    | 0960_SW208 |             | 17/05/2022 02:58 PM | Water  | ALS: 3<br>Non ALS: 0 | No      |               | Partial 4/8                  |                      |                        |
| 012    | 0960_QC109 |             | 17/05/2022 02:59 PM | Water  | ALS: 3<br>Non ALS: 0 | No      |               | Partial 4/8                  |                      |                        |
| 013    | 0960_QC301 |             | 17/05/2022 04:25 PM | Water  | ALS: 2<br>Non ALS: 0 | No      | X             |                              |                      |                        |
| 014    | 0960_QC401 |             | 17/05/2022 04:25 PM | Water  | ALS: 2<br>Non ALS: 0 | No      | X             |                              |                      |                        |

**CHAIN OF CUSTODY**

COC#: 37683

ALS Laboratory: EP Perth

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: DEF19009/Learmonth SW - MBMG

ORDER NO: DEF19009/0960

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

**LABORATORY USE ONLY (Circle)**

Custody Seal intact? 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:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

SAMPLER MOBILE:

/ ES2019CARBSD0002

| SAMPLE | SAMPLE NAME | PARTIAL ANALYSIS GROUP NAME  | MATRIX | SELECTED ANALYSIS NAME                                                                                                                                                                                      |
|--------|-------------|------------------------------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 001    | 0960_SW265  | Surface Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 002    | 0960_SW170  | Surface Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 003    | 0960_SW189  | Surface Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 004    | 0960_SW190  | Surface Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 005    | 0960_SW157  | Surface Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 006    | 0960_SW219  | Surface Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 007    | 0960_SW298  | Surface Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 008    | 0960_QC108  | Surface Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 009    | 0960_SW301  | Surface Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |



# CHAIN OF CUSTODY

COC#: 37683

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: DEF19009/Learmonth SW - MBMG

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:  
/ ES2019CARBSD0002

|     |            |                              |       |                                                                                                                                                                                                             |
|-----|------------|------------------------------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 010 | 0960_SW205 | Surface Waters Primary WATER | Water | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 011 | 0960_SW208 | Surface Waters Primary WATER | Water | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 012 | 0960_QC109 | Surface Waters Primary WATER | Water | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |



# CHAIN OF CUSTODY

COC#: 37683

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: DEF19009/Learmonth SW - MBMG

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:  
/ ES2019CARBSD0002

| SAMPLE | SAMPLE NAME | BOTTLE NAME                    | VOLUME | BARCODE        | TYPE  | FILTERED | REASON |
|--------|-------------|--------------------------------|--------|----------------|-------|----------|--------|
| 001    | 0960_SW265  | Clear Plastic Bottle - Natural | 250 mL | 00070621191152 | Green | No       |        |
| 001    | 0960_SW265  | HDPE (no PTFE)                 | 20 mL  | 00352101071401 | Grey  | No       |        |
| 001    | 0960_SW265  | HDPE (no PTFE)                 | 20 mL  | 00352101058067 | Grey  | No       |        |
| 001    | 0960_SW265  | HDPE (no PTFE)                 | 20 mL  | 00352101071948 | Grey  | No       |        |
| 001    | 0960_SW265  | HDPE (no PTFE)                 | 20 mL  | 00352101058203 | Grey  | No       |        |
| 002    | 0960_SW170  | HDPE (no PTFE)                 | 20 mL  | 00352101070877 | Grey  | No       |        |
| 002    | 0960_SW170  | HDPE (no PTFE)                 | 20 mL  | 00352101071815 | Grey  | No       |        |
| 002    | 0960_SW170  | Clear Plastic Bottle - Natural | 250 mL | 00070621191163 | Green | No       |        |
| 003    | 0960_SW189  | Clear Plastic Bottle - Natural | 250 mL | 00070621172070 | Green | No       |        |
| 003    | 0960_SW189  | HDPE (no PTFE)                 | 20 mL  | 00352101057781 | Grey  | No       |        |
| 003    | 0960_SW189  | HDPE (no PTFE)                 | 20 mL  | 00350621041386 | Grey  | No       |        |
| 004    | 0960_SW190  | Clear Plastic Bottle - Natural | 250 mL | 00070621172065 | Green | No       |        |
| 004    | 0960_SW190  | HDPE (no PTFE)                 | 20 mL  | 00352101057796 | Grey  | No       |        |
| 004    | 0960_SW190  | HDPE (no PTFE)                 | 20 mL  | 00352101057808 | Grey  | No       |        |
| 005    | 0960_SW157  | HDPE (no PTFE)                 | 20 mL  | 00352101058170 | Grey  | No       |        |
| 005    | 0960_SW157  | HDPE (no PTFE)                 | 20 mL  | 00350621041373 | Grey  | No       |        |
| 005    | 0960_SW157  | Clear Plastic Bottle - Natural | 250 mL | 00070621172442 | Green | No       |        |
| 006    | 0960_SW219  | HDPE (no PTFE)                 | 20 mL  | 00352101057824 | Grey  | No       |        |
| 006    | 0960_SW219  | HDPE (no PTFE)                 | 20 mL  | 00352101058255 | Grey  | No       |        |
| 006    | 0960_SW219  | Clear Plastic Bottle - Natural | 250 mL | 00070621172032 | Green | No       |        |
| 007    | 0960_SW298  | HDPE (no PTFE)                 | 20 mL  | 00352101057797 | Grey  | No       |        |
| 007    | 0960_SW298  | HDPE (no PTFE)                 | 20 mL  | 00350621041356 | Grey  | No       |        |
| 007    | 0960_SW298  | Clear Plastic Bottle - Natural | 250 mL | 00070621172051 | Green | No       |        |
| 008    | 0960_QC108  | Clear Plastic Bottle - Natural | 250 mL | 00070621172395 | Green | No       |        |
| 008    | 0960_QC108  | HDPE (no PTFE)                 | 20 mL  | 00350621046781 | Grey  | No       |        |
| 008    | 0960_QC108  | HDPE (no PTFE)                 | 20 mL  | 00352101057787 | Grey  | No       |        |

**CHAIN OF CUSTODY**

COC#: 37683

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: DEF19009/Learmonth SW - MBMG

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:  
/ ES2019CARBSD0002

|     |            |                                |        |                |       |    |  |
|-----|------------|--------------------------------|--------|----------------|-------|----|--|
| 009 | 0960_SW301 | Clear Plastic Bottle - Natural | 250 mL | 00070621172076 | Green | No |  |
| 009 | 0960_SW301 | HDPE (no PTFE)                 | 20 mL  | 00350621041446 | Grey  | No |  |
| 009 | 0960_SW301 | HDPE (no PTFE)                 | 20 mL  | 00352101058009 | Grey  | No |  |
| 010 | 0960_SW205 | Clear Plastic Bottle - Natural | 250 mL | 00070621172057 | Green | No |  |
| 010 | 0960_SW205 | HDPE (no PTFE)                 | 20 mL  | 00352101058262 | Grey  | No |  |
| 010 | 0960_SW205 | HDPE (no PTFE)                 | 20 mL  | 00352101057964 | Grey  | No |  |
| 011 | 0960_SW208 | Clear Plastic Bottle - Natural | 250 mL | 00070621172078 | Green | No |  |
| 011 | 0960_SW208 | HDPE (no PTFE)                 | 20 mL  | 00350621041471 | Grey  | No |  |
| 011 | 0960_SW208 | HDPE (no PTFE)                 | 20 mL  | 00350621041454 | Grey  | No |  |
| 012 | 0960_QC109 | Clear Plastic Bottle - Natural | 250 mL | 00070621172419 | Green | No |  |
| 012 | 0960_QC109 | HDPE (no PTFE)                 | 20 mL  | 00350621041440 | Grey  | No |  |
| 012 | 0960_QC109 | HDPE (no PTFE)                 | 20 mL  | 00352101058175 | Grey  | No |  |
| 013 | 0960_QC301 | HDPE (no PTFE)                 | 20 mL  | 00350019035156 | Grey  | No |  |
| 013 | 0960_QC301 | HDPE (no PTFE)                 | 20 mL  | 00350019026913 | Grey  | No |  |
| 014 | 0960_QC401 | HDPE (no PTFE)                 | 20 mL  | 00350019177546 | Grey  | No |  |
| 014 | 0960_QC401 | HDPE (no PTFE)                 | 20 mL  | 00350019177545 | Grey  | No |  |

**Total Bottle Count: ALS: 42, Non ALS: 0**



## SAMPLE RECEIPT NOTIFICATION (SRN)

**Work Order : EP2205925**

|                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Client : <b>Please use account - MWHAUS</b></p> <p>Contact : [REDACTED]</p> <p>Address : 11 HARVEST TERRACE PO BOX 155<br/>WEST PERTH WA, AUSTRALIA 6006</p> <p>E-mail : [REDACTED]@cardno.com.au</p> <p>Telephone : ----</p> <p>Facsimile : ----</p> <p>Project : WA_0960_PFASOMP</p> <p>Order number : DEF19009/0960</p> <p>C-O-C number : 37683</p> <p>Site : DEF19009/Learmonth</p> <p>Sampler : [REDACTED]</p> | <p>Laboratory : Environmental Division Perth</p> <p>Contact : REBECCA OWEN</p> <p>Address : 26 Rigali Way Wangara WA Australia<br/>6065</p> <p>E-mail : rebecca.owen@alsglobal.com</p> <p>Telephone : +61-8-9406 1301</p> <p>Facsimile : +61-8-9406 1399</p> <p>Page : 1 of 2</p> <p>Quote number : ES2019CARBSD0002 (SY/139/19 B)</p> <p>QC Level : NEPM 2013 B3 &amp; ALS QC Standard</p> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Dates

|                                           |                                               |
|-------------------------------------------|-----------------------------------------------|
| Date Samples Received : 20-May-2022 11:30 | Issue Date : 23-May-2022                      |
| Client Requested Due : 01-Jun-2022        | Scheduled Reporting Date : <b>01-Jun-2022</b> |
| Date                                      |                                               |

### Delivery Details

|                            |                                              |
|----------------------------|----------------------------------------------|
| Mode of Delivery : Carrier | Security Seal : Not Available                |
| No. of coolers/boxes : 2   | Temperature : 21.5 - Ice present             |
| Receipt Detail :           | No. of samples received / analysed : 14 / 14 |

### General Comments

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



## Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exists.

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

| Laboratory sample ID | Sampling date / time | Sample ID         | WATER - EN055 - PG<br>Ionic Balance by ED037P, ED041G, ED045G &<br>WATER - EP231X<br>PFAS - Full Suite (28 analytes) | WATER - NT-01<br>Major Cations (Ca, Mg, Na, K) | WATER - NT-02<br>Major Anions (Chloride, Sulphate, Alkalinity) |
|----------------------|----------------------|-------------------|----------------------------------------------------------------------------------------------------------------------|------------------------------------------------|----------------------------------------------------------------|
| EP2205925-001        | 17-May-2022 09:36    | 0960_SW265_220517 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2205925-002        | 17-May-2022 09:50    | 0960_SW170_220517 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2205925-003        | 17-May-2022 11:01    | 0960_SW189_220517 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2205925-004        | 17-May-2022 11:11    | 0960_SW190_220517 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2205925-005        | 17-May-2022 12:21    | 0960_SW157_220517 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2205925-006        | 17-May-2022 13:26    | 0960_SW219_220517 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2205925-007        | 17-May-2022 14:08    | 0960_SW298_220517 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2205925-008        | 17-May-2022 14:10    | 0960_QC108_220517 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2205925-009        | 17-May-2022 14:28    | 0960_SW301_220517 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2205925-010        | 17-May-2022 14:46    | 0960_SW205_220517 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2205925-011        | 17-May-2022 14:58    | 0960_SW208_220517 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2205925-012        | 17-May-2022 14:59    | 0960_QC109_220517 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2205925-013        | 17-May-2022 16:25    | 0960_QC301_220517 |                                                                                                                      | ✓                                              |                                                                |
| EP2205925-014        | 17-May-2022 16:25    | 0960_QC401_220517 |                                                                                                                      | ✓                                              |                                                                |

## Proactive Holding Time Report

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

## Requested Deliverables

|                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <div> <div></div> <div></div> </div> <ul style="list-style-type: none"> <li>- A4 - AU Tax Invoice (INV)</li> </ul>                                                                                                                                                                                                                                                                                                                                            | Email | <div> <div></div> <div>cardno.com.au</div> </div>                                                                                                                                                                                                                                                                                                             |
| <b>DERP LAB REPORTS</b> <ul style="list-style-type: none"> <li>- EDI Format - ESDAT (ESDAT)</li> </ul>                                                                                                                                                                                                                                                                                                                                                        | Email | <div> <div></div> <div>derp.labreports@esdat.com.au</div> </div>                                                                                                                                                                                                                                                                                              |
| <div> <div></div> <div></div> </div> <ul style="list-style-type: none"> <li>- *AU Certificate of Analysis - NATA (COA)</li> <li>- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)</li> <li>- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)</li> <li>- A4 - AU Sample Receipt Notification - Environmental HT (SRN)</li> <li>- Chain of Custody (CoC) (COC)</li> <li>- EDI Format - ESDAT (ESDAT)</li> <li>- EDI Format - XTab (XTAB)</li> </ul> | Email | <div> <div></div> <div>cardno.com.au</div> </div> <div> <div></div> <div>cardno.com.au</div> </div> <div> <div></div> <div>cardno.com.au</div> </div> <div> <div></div> <div>cardno.com.au</div> </div> <div> <div></div> <div>cardno.com.au</div> </div> <div> <div></div> <div>cardno.com.au</div> </div> <div> <div></div> <div>cardno.com.au</div> </div> |
| <b>Perth</b> <ul style="list-style-type: none"> <li>- A4 - AU Tax Invoice (INV)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                    | Email | <div> <div></div> <div>perth@cardno.com.au</div> </div>                                                                                                                                                                                                                                                                                                       |
| <b>RICCARDO DIVITA</b> <ul style="list-style-type: none"> <li>- A4 - AU Tax Invoice (INV)</li> </ul>                                                                                                                                                                                                                                                                                                                                                          | Email | <div> <div></div> <div>riccardo.divita@cardno.com.au</div> </div>                                                                                                                                                                                                                                                                                             |

## CERTIFICATE OF ANALYSIS

**Work Order** : EP2205925  
**Client** : STANTEC AUSTRALIA PTY LTD  
**Contact** : [REDACTED]  
**Address** : GROUND FLOOR 226 ADELAIDE TERRACE  
 PERTH 6000  
**Telephone** : ----  
**Project** : WA\_0960\_PFASOMP  
**Order number** : DEF19009/0960  
**C-O-C number** : 37683  
**Sampler** : [REDACTED]  
**Site** : DEF19009/Learmonth  
**Quote number** : SY/139/19 B  
**No. of samples received** : 14  
**No. of samples analysed** : 14

**Page** : 1 of 14  
**Laboratory** : Environmental Division Perth  
**Contact** : Customer Services EP  
**Address** : 26 Rigali Way Wangara Western Australia Australia 6065  
**Telephone** : +61-8-9406 1301  
**Date Samples Received** : 20-May-2022 11:30  
**Date Analysis Commenced** : 24-May-2022  
**Issue Date** : 30-May-2022 13:54



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>                |
|------------------------------------------------------------------------|----------------------------|----------------------------------------------|
| <span style="background-color: black; color: black;">[REDACTED]</span> | Laboratory Manager (Perth) | Perth Inorganics, Wangara, Western Australia |
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator           | Sydney Organics, Smithfield, NSW             |



## 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.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- 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.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, 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: RINSATE  
 (Matrix: WATER)

Sample ID

| Sub-Matrix: RINSATE<br>(Matrix: WATER)        |            |      |      | Sample ID     | 0960_QC301_220517 | 0960_QC401_220517 | ----  | ----  | ---- |
|-----------------------------------------------|------------|------|------|---------------|-------------------|-------------------|-------|-------|------|
| Sampling date / time                          |            |      |      |               | 17-May-2022 16:25 | 17-May-2022 16:25 | ----  | ----  | ---- |
| Compound                                      | CAS Number | LOR  | Unit | EP2205925-013 | EP2205925-014     | -----             | ----- | ----- |      |
|                                               |            |      |      | 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: RINSATE<br>(Matrix: WATER)                    |                    |      |      | Sample ID | 0960_QC301_220517 | 0960_QC401_220517 | ----  | ----  | ----  |
| Sampling date / time                                      |                    |      |      |           | 17-May-2022 16:25 | 17-May-2022 16:25 | ----  | ----  | ----  |
| Compound                                                  | CAS Number         | LOR  | Unit |           | EP2205925-013     | EP2205925-014     | ----- | ----- | ----- |
|                                                           |                    |      |      | 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 | %    |           | 102               | 97.1              | ----  | ----  | ----  |
| 13C8-PFOA                                                 | ----               | 0.02 | %    |           | 94.9              | 91.2              | ----  | ----  | ----  |





## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                        |             |      |       | 0960_SW265_220517 | 0960_SW170_220517 | 0960_SW189_220517 | 0960_SW190_220517 | 0960_SW157_220517 |
|--------------------------------------------------------|-------------|------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                   |             |      |       | 17-May-2022 09:36 | 17-May-2022 09:50 | 17-May-2022 11:01 | 17-May-2022 11:11 | 17-May-2022 12:21 |
| Compound                                               | CAS Number  | LOR  | Unit  | EP2205925-001     | EP2205925-002     | EP2205925-003     | EP2205925-004     | EP2205925-005     |
|                                                        |             |      |       | Result            | Result            | Result            | Result            | Result            |
| <b>ED037P: Alkalinity by PC Titrator</b>               |             |      |       |                   |                   |                   |                   |                   |
| Hydroxide Alkalinity as CaCO3                          | DMO-210-001 | 1    | mg/L  | <1                | <1                | <1                | <1                | <1                |
| Carbonate Alkalinity as CaCO3                          | 3812-32-6   | 1    | mg/L  | <1                | <1                | <1                | <1                | <1                |
| Bicarbonate Alkalinity as CaCO3                        | 71-52-3     | 1    | mg/L  | 64                | 92                | 65                | 70                | 68                |
| Total Alkalinity as CaCO3                              | ----        | 1    | mg/L  | 64                | 92                | 65                | 70                | 68                |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b> |             |      |       |                   |                   |                   |                   |                   |
| Sulfate as SO4 - Turbidimetric                         | 14808-79-8  | 1    | mg/L  | 222               | 15                | 155               | 226               | 284               |
| <b>ED045G: Chloride by Discrete Analyser</b>           |             |      |       |                   |                   |                   |                   |                   |
| Chloride                                               | 16887-00-6  | 1    | mg/L  | 1770              | 42                | 1260              | 1620              | 2280              |
| <b>ED093F: Dissolved Major Cations</b>                 |             |      |       |                   |                   |                   |                   |                   |
| Calcium                                                | 7440-70-2   | 1    | mg/L  | 64                | 20                | 47                | 52                | 76                |
| Magnesium                                              | 7439-95-4   | 1    | mg/L  | 105               | 4                 | 68                | 99                | 116               |
| Sodium                                                 | 7440-23-5   | 1    | mg/L  | 982               | 32                | 614               | 835               | 1140              |
| Potassium                                              | 7440-09-7   | 1    | mg/L  | 61                | 6                 | 40                | 53                | 64                |
| <b>EN055: Ionic Balance</b>                            |             |      |       |                   |                   |                   |                   |                   |
| ∅ Total Anions                                         | ----        | 0.01 | meq/L | 55.8              | 3.34              | 40.1              | 51.8              | 71.6              |
| ∅ Total Cations                                        | ----        | 0.01 | meq/L | 56.1              | 2.87              | 35.7              | 48.4              | 64.6              |
| ∅ Ionic Balance                                        | ----        | 0.01 | %     | 0.25              | 7.45              | 5.80              | 3.38              | 5.16              |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>           |             |      |       |                   |                   |                   |                   |                   |
| Perfluorobutane sulfonic acid (PFBS)                   | 375-73-5    | 0.02 | µg/L  | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| Perfluoropentane sulfonic acid (PFPeS)                 | 2706-91-4   | 0.02 | µg/L  | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| Perfluorohexane sulfonic acid (PFHxS)                  | 355-46-4    | 0.01 | µg/L  | 0.02              | <0.01             | 0.01              | 0.01              | 0.02              |
| 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  | 1.11              | 0.16              | 0.44              | 0.26              | 0.07              |
| Perfluorodecane sulfonic acid (PFDS)                   | 335-77-3    | 0.02 | µg/L  | 0.04              | <0.02             | <0.02             | <0.02             | <0.02             |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>         |             |      |       |                   |                   |                   |                   |                   |
| 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             |



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_SW265_220517 | 0960_SW170_220517 | 0960_SW189_220517 | 0960_SW190_220517 | 0960_SW157_220517 |
|------------------------------------------------------------|-------------|------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                       |             |      |      | 17-May-2022 09:36 | 17-May-2022 09:50 | 17-May-2022 11:01 | 17-May-2022 11:11 | 17-May-2022 12:21 |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2205925-001     | EP2205925-002     | EP2205925-003     | EP2205925-004     | EP2205925-005     |
|                                                            |             |      |      | Result            | Result            | Result            | Result            | Result            |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                   |                   |                   |                   |                   |
| 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             |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                   |                   |                   |                   |                   |
| Perfluorooctane sulfonamide (FOSA)                         | 754-91-6    | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)              | 31506-32-8  | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)               | 4151-50-2   | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)       | 24448-09-7  | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)        | 1691-99-2   | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)  | 2355-31-9   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)   | 2991-50-6   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                   |                   |                   |                   |                   |
| 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             |



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_SW265_220517 | 0960_SW170_220517 | 0960_SW189_220517 | 0960_SW190_220517 | 0960_SW157_220517 |
|---------------------------------------------------------------|--------------------|------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                          |                    |      |      | 17-May-2022 09:36 | 17-May-2022 09:50 | 17-May-2022 11:01 | 17-May-2022 11:11 | 17-May-2022 12:21 |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2205925-001     | EP2205925-002     | EP2205925-003     | EP2205925-004     | EP2205925-005     |
|                                                               |                    |      |      | Result            | Result            | Result            | Result            | Result            |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                   |                   |                   |                   |                   |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                   |                   |                   |                   |                   |
| Sum of PFAS                                                   | ----               | 0.01 | µg/L | 1.17              | 0.16              | 0.45              | 0.27              | 0.09              |
| Sum of PFHxS and PFOS                                         | 355-46-4/1763-23-1 | 0.01 | µg/L | 1.13              | 0.16              | 0.45              | 0.27              | 0.09              |
| Sum of PFAS (WA DER List)                                     | ----               | 0.01 | µg/L | 1.13              | 0.16              | 0.45              | 0.27              | 0.09              |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 99.9              | 93.5              | 103               | 94.4              | 100               |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 101               | 96.2              | 102               | 95.6              | 107               |



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                        |             |      |       | 0960_SW219_220517 | 0960_SW298_220517 | 0960_QC108_220517 | 0960_SW301_220517 | 0960_SW205_220517 |
|--------------------------------------------------------|-------------|------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                   |             |      |       | 17-May-2022 13:26 | 17-May-2022 14:08 | 17-May-2022 14:10 | 17-May-2022 14:28 | 17-May-2022 14:46 |
| Compound                                               | CAS Number  | LOR  | Unit  | EP2205925-006     | EP2205925-007     | EP2205925-008     | EP2205925-009     | EP2205925-010     |
|                                                        |             |      |       | Result            | Result            | Result            | Result            | Result            |
| <b>ED037P: Alkalinity by PC Titrator</b>               |             |      |       |                   |                   |                   |                   |                   |
| Hydroxide Alkalinity as CaCO3                          | DMO-210-001 | 1    | mg/L  | <1                | <1                | <1                | <1                | <1                |
| Carbonate Alkalinity as CaCO3                          | 3812-32-6   | 1    | mg/L  | <1                | <1                | <1                | <1                | <1                |
| Bicarbonate Alkalinity as CaCO3                        | 71-52-3     | 1    | mg/L  | 98                | 191               | 193               | 182               | 162               |
| Total Alkalinity as CaCO3                              | ----        | 1    | mg/L  | 98                | 191               | 193               | 182               | 162               |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b> |             |      |       |                   |                   |                   |                   |                   |
| Sulfate as SO4 - Turbidimetric                         | 14808-79-8  | 1    | mg/L  | 2                 | 3120              | 3120              | 2950              | 2850              |
| <b>ED045G: Chloride by Discrete Analyser</b>           |             |      |       |                   |                   |                   |                   |                   |
| Chloride                                               | 16887-00-6  | 1    | mg/L  | 6                 | 22200             | 22100             | 21500             | 20600             |
| <b>ED093F: Dissolved Major Cations</b>                 |             |      |       |                   |                   |                   |                   |                   |
| Calcium                                                | 7440-70-2   | 1    | mg/L  | 14                | 509               | 509               | 474               | 473               |
| Magnesium                                              | 7439-95-4   | 1    | mg/L  | 3                 | 1570              | 1570              | 1460              | 1490              |
| Sodium                                                 | 7440-23-5   | 1    | mg/L  | 18                | 11500             | 11500             | 10900             | 11100             |
| Potassium                                              | 7440-09-7   | 1    | mg/L  | 10                | 599               | 601               | 572               | 585               |
| <b>EN055: Ionic Balance</b>                            |             |      |       |                   |                   |                   |                   |                   |
| ∅ Total Anions                                         | ----        | 0.01 | meq/L | 2.17              | 695               | 692               | 672               | 644               |
| ∅ Total Cations                                        | ----        | 0.01 | meq/L | 1.98              | 670               | 670               | 632               | 644               |
| ∅ Ionic Balance                                        | ----        | 0.01 | %     | 4.45              | 1.82              | 1.62              | 2.99              | 0.03              |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>           |             |      |       |                   |                   |                   |                   |                   |
| 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  | 0.13              | <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             |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>         |             |      |       |                   |                   |                   |                   |                   |
| 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             |



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_SW219_220517 | 0960_SW298_220517 | 0960_QC108_220517 | 0960_SW301_220517 | 0960_SW205_220517 |
|------------------------------------------------------------|-------------|------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                       |             |      |      | 17-May-2022 13:26 | 17-May-2022 14:08 | 17-May-2022 14:10 | 17-May-2022 14:28 | 17-May-2022 14:46 |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2205925-006     | EP2205925-007     | EP2205925-008     | EP2205925-009     | EP2205925-010     |
|                                                            |             |      |      | Result            | Result            | Result            | Result            | Result            |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                   |                   |                   |                   |                   |
| 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             |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                   |                   |                   |                   |                   |
| Perfluorooctane sulfonamide (FOSA)                         | 754-91-6    | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)              | 31506-32-8  | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)               | 4151-50-2   | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)       | 24448-09-7  | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)        | 1691-99-2   | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)  | 2355-31-9   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)   | 2991-50-6   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                   |                   |                   |                   |                   |
| 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             |



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_SW219_220517 | 0960_SW298_220517 | 0960_QC108_220517 | 0960_SW301_220517 | 0960_SW205_220517 |
|---------------------------------------------------------------|--------------------|------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                          |                    |      |      | 17-May-2022 13:26 | 17-May-2022 14:08 | 17-May-2022 14:10 | 17-May-2022 14:28 | 17-May-2022 14:46 |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2205925-006     | EP2205925-007     | EP2205925-008     | EP2205925-009     | EP2205925-010     |
|                                                               |                    |      |      | Result            | Result            | Result            | Result            | Result            |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                   |                   |                   |                   |                   |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                   |                   |                   |                   |                   |
| Sum of PFAS                                                   | ----               | 0.01 | µg/L | 0.13              | <0.01             | <0.01             | <0.01             | <0.01             |
| Sum of PFHxS and PFOS                                         | 355-46-4/1763-23-1 | 0.01 | µg/L | 0.13              | <0.01             | <0.01             | <0.01             | <0.01             |
| Sum of PFAS (WA DER List)                                     | ----               | 0.01 | µg/L | 0.13              | <0.01             | <0.01             | <0.01             | <0.01             |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 99.1              | 98.2              | 102               | 102               | 98.1              |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 98.8              | 97.8              | 99.5              | 97.0              | 92.2              |





## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                        |             |      |       | 0960_SW208_220517 | 0960_QC109_220517 | ----  | ----  | ----  |
|--------------------------------------------------------|-------------|------|-------|-------------------|-------------------|-------|-------|-------|
| Sampling date / time                                   |             |      |       | 17-May-2022 14:58 | 17-May-2022 14:59 | ----  | ----  | ----  |
| Compound                                               | CAS Number  | LOR  | Unit  | EP2205925-011     | EP2205925-012     | ----- | ----- | ----- |
| Result                                                 |             |      |       | Result            | Result            | ----  | ----  | ----  |
| <b>ED037P: Alkalinity by PC Titrator</b>               |             |      |       |                   |                   |       |       |       |
| Hydroxide Alkalinity as CaCO3                          | DMO-210-001 | 1    | mg/L  | <1                | <1                | ----  | ----  | ----  |
| Carbonate Alkalinity as CaCO3                          | 3812-32-6   | 1    | mg/L  | <1                | <1                | ----  | ----  | ----  |
| Bicarbonate Alkalinity as CaCO3                        | 71-52-3     | 1    | mg/L  | 126               | 127               | ----  | ----  | ----  |
| Total Alkalinity as CaCO3                              | ----        | 1    | mg/L  | 126               | 127               | ----  | ----  | ----  |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b> |             |      |       |                   |                   |       |       |       |
| Sulfate as SO4 - Turbidimetric                         | 14808-79-8  | 1    | mg/L  | 2790              | 2800              | ----  | ----  | ----  |
| <b>ED045G: Chloride by Discrete Analyser</b>           |             |      |       |                   |                   |       |       |       |
| Chloride                                               | 16887-00-6  | 1    | mg/L  | 19700             | 19900             | ----  | ----  | ----  |
| <b>ED093F: Dissolved Major Cations</b>                 |             |      |       |                   |                   |       |       |       |
| Calcium                                                | 7440-70-2   | 1    | mg/L  | 438               | 406               | ----  | ----  | ----  |
| Magnesium                                              | 7439-95-4   | 1    | mg/L  | 1420              | 1330              | ----  | ----  | ----  |
| Sodium                                                 | 7440-23-5   | 1    | mg/L  | 10600             | 9770              | ----  | ----  | ----  |
| Potassium                                              | 7440-09-7   | 1    | mg/L  | 555               | 518               | ----  | ----  | ----  |
| <b>EN055: Ionic Balance</b>                            |             |      |       |                   |                   |       |       |       |
| ∅ Total Anions                                         | ----        | 0.01 | meq/L | 616               | 622               | ----  | ----  | ----  |
| ∅ Total Cations                                        | ----        | 0.01 | meq/L | 614               | 568               | ----  | ----  | ----  |
| ∅ Ionic Balance                                        | ----        | 0.01 | %     | 0.19              | 4.56              | ----  | ----  | ----  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>           |             |      |       |                   |                   |       |       |       |
| 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             | ----  | ----  | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>         |             |      |       |                   |                   |       |       |       |
| 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             | ----  | ----  | ----  |



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_SW208_220517 | 0960_QC109_220517 | ----  | ----  | ----  |
|------------------------------------------------------------|-------------|------|------|-------------------|-------------------|-------|-------|-------|
| Sampling date / time                                       |             |      |      | 17-May-2022 14:58 | 17-May-2022 14:59 | ----  | ----  | ----  |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2205925-011     | EP2205925-012     | ----- | ----- | ----- |
|                                                            |             |      |      | Result            | Result            | ----  | ----  | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                   |                   |       |       |       |
| 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             | ----  | ----  | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                   |                   |       |       |       |
| 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             | ----  | ----  | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                   |                   |       |       |       |
| 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             | ----  | ----  | ----  |



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_SW208_220517 | 0960_QC109_220517 | ----  | ----  | ----  |
|---------------------------------------------------------------|--------------------|------|------|-------------------|-------------------|-------|-------|-------|
| Sampling date / time                                          |                    |      |      | 17-May-2022 14:58 | 17-May-2022 14:59 | ----  | ----  | ----  |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2205925-011     | EP2205925-012     | ----- | ----- | ----- |
| Result                                                        |                    |      |      | Result            | Result            | ----  | ----  | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                   |                   |       |       |       |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05             | <0.05             | ----  | ----  | ----  |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                   |                   |       |       |       |
| 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             | ----  | ----  | ----  |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                   |                   |       |       |       |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 97.6              | 100               | ----  | ----  | ----  |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 92.0              | 95.1              | ----  | ----  | ----  |



## Surrogate Control Limits

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

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

## Inter-Laboratory Testing

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

|                                |                                                           |                                |                                                                 |
|--------------------------------|-----------------------------------------------------------|--------------------------------|-----------------------------------------------------------------|
| <b>Work Order</b>              | <b>: EP2205925</b>                                        | <b>Page</b>                    | <b>: 1 of 9</b>                                                 |
| <b>Client</b>                  | <b>: STANTEC AUSTRALIA PTY LTD</b>                        | <b>Laboratory</b>              | <b>: Environmental Division Perth</b>                           |
| <b>Contact</b>                 | <b>: [REDACTED]</b>                                       | <b>Contact</b>                 | <b>: Customer Services EP</b>                                   |
| <b>Address</b>                 | <b>: GROUND FLOOR 226 ADELAIDE TERRACE<br/>PERTH 6000</b> | <b>Address</b>                 | <b>: 26 Rigali Way Wangara Western Australia Australia 6065</b> |
| <b>Telephone</b>               | <b>: ----</b>                                             | <b>Telephone</b>               | <b>: +61-8-9406 1301</b>                                        |
| <b>Project</b>                 | <b>: WA_0960_PFASOMP</b>                                  | <b>Date Samples Received</b>   | <b>: 20-May-2022</b>                                            |
| <b>Order number</b>            | <b>: DEF19009/0960</b>                                    | <b>Date Analysis Commenced</b> | <b>: 24-May-2022</b>                                            |
| <b>C-O-C number</b>            | <b>: 37683</b>                                            | <b>Issue Date</b>              | <b>: 30-May-2022</b>                                            |
| <b>Sampler</b>                 | <b>: [REDACTED]</b>                                       |                                |                                                                 |
| <b>Site</b>                    | <b>: DEF19009/Learmonth</b>                               |                                |                                                                 |
| <b>Quote number</b>            | <b>: SY/139/19 B</b>                                      |                                |                                                                 |
| <b>No. of samples received</b> | <b>: 14</b>                                               |                                |                                                                 |
| <b>No. of samples analysed</b> | <b>: 14</b>                                               |                                |                                                                 |



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

This Quality Control Report contains the following information:

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

### Signatories

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

| Signatories | Position                   | Accreditation Category                       |
|-------------|----------------------------|----------------------------------------------|
| [REDACTED]  | Laboratory Manager (Perth) | Perth Inorganics, Wangara, Western Australia |
| [REDACTED]  | LCMS Coordinator           | Sydney Organics, Smithfield, NSW             |



## 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**

| Sub-Matrix: WATER                                                 |                   |                                          |             | Laboratory Duplicate (DUP) Report |      |                 |                  |         |                    |
|-------------------------------------------------------------------|-------------------|------------------------------------------|-------------|-----------------------------------|------|-----------------|------------------|---------|--------------------|
| Laboratory sample ID                                              | Sample ID         | Method: Compound                         | CAS Number  | LOR                               | Unit | Original Result | Duplicate Result | RPD (%) | Acceptable RPD (%) |
| ED037P: Alkalinity by PC Titrator (QC Lot: 4362316)               |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2205862-002                                                     | Anonymous         | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 54              | 56               | 3.7     | 0% - 20%           |
|                                                                   |                   | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 54              | 56               | 3.7     | 0% - 20%           |
| EP2205864-006                                                     | Anonymous         | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 59              | 60               | 0.0     | 0% - 20%           |
|                                                                   |                   | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 59              | 60               | 0.0     | 0% - 20%           |
| ED037P: Alkalinity by PC Titrator (QC Lot: 4362317)               |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2206134-003                                                     | Anonymous         | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 44              | 43               | 2.3     | 0% - 20%           |
|                                                                   |                   | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 44              | 43               | 2.3     | 0% - 20%           |
| EP2206004-003                                                     | Anonymous         | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 143             | 144              | 0.0     | 0% - 20%           |
|                                                                   |                   | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 143             | 144              | 0.0     | 0% - 20%           |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4355327) |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2205925-001                                                     | 0960_SW265_220517 | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 222             | 223              | 0.7     | 0% - 20%           |
| EP2205925-011                                                     | 0960_SW208_220517 | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 2790            | 2800             | 0.5     | 0% - 20%           |
| ED045G: Chloride by Discrete Analyser (QC Lot: 4355326)           |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2205925-001                                                     | 0960_SW265_220517 | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 1770            | 1780             | 0.6     | 0% - 20%           |
| EP2205925-011                                                     | 0960_SW208_220517 | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 19700           | 19600            | 0.5     | 0% - 20%           |





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 (%) |
| ED093F: Dissolved Major Cations (QC Lot: 4355480)         |                   |                                                |            |                                   |      |                 |                  |         |                    |
| EP2205925-001                                             | 0960_SW265_220517 | ED093F: Calcium                                | 7440-70-2  | 1                                 | mg/L | 64              | 60               | 7.1     | 0% - 20%           |
|                                                           |                   | ED093F: Magnesium                              | 7439-95-4  | 1                                 | mg/L | 105             | 97               | 7.6     | 0% - 20%           |
|                                                           |                   | ED093F: Sodium                                 | 7440-23-5  | 1                                 | mg/L | 982             | 904              | 8.3     | 0% - 20%           |
|                                                           |                   | ED093F: Potassium                              | 7440-09-7  | 1                                 | mg/L | 61              | 56               | 9.6     | 0% - 20%           |
| EP2205925-011                                             | 0960_SW208_220517 | ED093F: Calcium                                | 7440-70-2  | 1                                 | mg/L | 438             | 431              | 1.6     | 0% - 20%           |
|                                                           |                   | ED093F: Magnesium                              | 7439-95-4  | 1                                 | mg/L | 1420            | 1410             | 0.7     | 0% - 20%           |
|                                                           |                   | ED093F: Sodium                                 | 7440-23-5  | 1                                 | mg/L | 10600           | 10500            | 0.5     | 0% - 20%           |
|                                                           |                   | ED093F: Potassium                              | 7440-09-7  | 1                                 | mg/L | 555             | 559              | 0.8     | 0% - 20%           |
| EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4361412)   |                   |                                                |            |                                   |      |                 |                  |         |                    |
| EP2205862-003                                             | Anonymous         | EP231X: Perfluorohexane sulfonic acid (PFHxS)  | 355-46-4   | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
|                                                           |                   | EP231X: Perfluorooctane sulfonic acid (PFOS)   | 1763-23-1  | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
|                                                           |                   | EP231X: Perfluorobutane sulfonic acid (PFBS)   | 375-73-5   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |                   | EP231X: Perfluoropentane sulfonic acid (PFPeS) | 2706-91-4  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |                   | EP231X: Perfluoroheptane sulfonic acid (PFHpS) | 375-92-8   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |                   | EP231X: Perfluorodecane sulfonic acid (PFDS)   | 335-77-3   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
| EP2205925-001                                             | 0960_SW265_220517 | EP231X: Perfluorohexane sulfonic acid (PFHxS)  | 355-46-4   | 0.01                              | µg/L | 0.02            | 0.02             | 0.0     | No Limit           |
|                                                           |                   | EP231X: Perfluorooctane sulfonic acid (PFOS)   | 1763-23-1  | 0.01                              | µg/L | 1.11            | 0.93             | 17.8    | 0% - 20%           |
|                                                           |                   | EP231X: Perfluorobutane sulfonic acid (PFBS)   | 375-73-5   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |                   | EP231X: Perfluoropentane sulfonic acid (PFPeS) | 2706-91-4  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |                   | EP231X: Perfluoroheptane sulfonic acid (PFHpS) | 375-92-8   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
| EP231X: Perfluorodecane sulfonic acid (PFDS)              | 335-77-3          | 0.02                                           | µg/L       | 0.04                              | 0.03 | 0.0             | No Limit         |         |                    |
| EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4361412) |                   |                                                |            |                                   |      |                 |                  |         |                    |
| EP2205862-003                                             | 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 (PFTeDA)     | 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           |
| EP2205925-001                                             | 0960_SW265_220517 | 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**

| Sub-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: 4361412) - continued |                   |                                                                   |             |                                   |      |                 |                  |         |                    |
| EP2205925-001                                                         | 0960_SW265_220517 | 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: 4361412)                 |                   |                                                                   |             |                                   |      |                 |                  |         |                    |
| EP2205862-003                                                         | 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           |
| EP2205925-001                                                         | 0960_SW265_220517 | 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: 4361412)          |                   |                                                                   |             |                                   |      |                 |                  |         |                    |
| EP2205862-003                                                         | 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           |

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 Work Order : EP2205925  
 Client : STANTEC AUSTRALIA PTY LTD  
 Project : WA\_0960\_PFASOMP



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 (%) |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4361412) - continued |                   |                                                     |             |                                   |      |                 |                  |         |                    |
| EP2205925-001                                                            | 0960_SW265_220517 | 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: 4361412)                                      |                   |                                                     |             |                                   |      |                 |                  |         |                    |
| EP2205862-003                                                            | Anonymous         | EP231X: Sum of PFAS                                 | ----        | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
| EP2205925-001                                                            | 0960_SW265_220517 | EP231X: Sum of PFAS                                 | ----        | 0.01                              | µg/L | 1.17            | 0.98             | 17.7    | 0% - 20%           |



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

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

Sub-Matrix: **WATER**

| Sub-Matrix: WATER                                                |                 |      |      | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                    |                       |      |
|------------------------------------------------------------------|-----------------|------|------|-----------------------------|---------------------------------------|--------------------|-----------------------|------|
|                                                                  |                 |      |      |                             | Spike<br>Concentration                | Spike Recovery (%) | Acceptable Limits (%) |      |
| Method: Compound                                                 | CAS Number      | LOR  | Unit |                             |                                       | LCS                | Low                   | High |
| ED037P: Alkalinity by PC Titrator (QCLot: 4362316)               |                 |      |      |                             |                                       |                    |                       |      |
| ED037-P: Hydroxide Alkalinity as CaCO3                           | DMO-210-00<br>1 | 1    | mg/L | <1                          | ----                                  | ----               | ----                  | ---- |
| ED037-P: Carbonate Alkalinity as CaCO3                           | 3812-32-6       | 1    | mg/L | <1                          | ----                                  | ----               | ----                  | ---- |
| ED037-P: Bicarbonate Alkalinity as CaCO3                         | 71-52-3         | 1    | mg/L | <1                          | ----                                  | ----               | ----                  | ---- |
| ED037-P: Total Alkalinity as CaCO3                               | ----            | 1    | mg/L | <1                          | 20 mg/L                               | 107                | 81.2                  | 126  |
|                                                                  |                 |      |      | <1                          | 200 mg/L                              | 96.9               | 90.0                  | 110  |
| ED037P: Alkalinity by PC Titrator (QCLot: 4362317)               |                 |      |      |                             |                                       |                    |                       |      |
| ED037-P: Hydroxide Alkalinity as CaCO3                           | DMO-210-00<br>1 | 1    | mg/L | <1                          | ----                                  | ----               | ----                  | ---- |
| ED037-P: Carbonate Alkalinity as CaCO3                           | 3812-32-6       | 1    | mg/L | <1                          | ----                                  | ----               | ----                  | ---- |
| ED037-P: Bicarbonate Alkalinity as CaCO3                         | 71-52-3         | 1    | mg/L | <1                          | ----                                  | ----               | ----                  | ---- |
| ED037-P: Total Alkalinity as CaCO3                               | ----            | 1    | mg/L | <1                          | 20 mg/L                               | 111                | 81.2                  | 126  |
|                                                                  |                 |      |      | <1                          | 200 mg/L                              | 99.8               | 90.0                  | 110  |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4355327) |                 |      |      |                             |                                       |                    |                       |      |
| ED041G: Sulfate as SO4 - Turbidimetric                           | 14808-79-8      | 1    | mg/L | <1                          | 25 mg/L                               | 105                | 87.7                  | 113  |
|                                                                  |                 |      |      | <1                          | 500 mg/L                              | 102                | 87.7                  | 113  |
| ED045G: Chloride by Discrete Analyser (QCLot: 4355326)           |                 |      |      |                             |                                       |                    |                       |      |
| ED045G: Chloride                                                 | 16887-00-6      | 1    | mg/L | <1                          | 10 mg/L                               | 109                | 87.9                  | 114  |
|                                                                  |                 |      |      | <1                          | 1000 mg/L                             | 109                | 87.9                  | 114  |
| ED093F: Dissolved Major Cations (QCLot: 4355480)                 |                 |      |      |                             |                                       |                    |                       |      |
| ED093F: Calcium                                                  | 7440-70-2       | 1    | mg/L | <1                          | 50 mg/L                               | 99.3               | 85.9                  | 113  |
| ED093F: Magnesium                                                | 7439-95-4       | 1    | mg/L | <1                          | 50 mg/L                               | 102                | 88.0                  | 110  |
| ED093F: Sodium                                                   | 7440-23-5       | 1    | mg/L | <1                          | 50 mg/L                               | 106                | 87.3                  | 118  |
| ED093F: Potassium                                                | 7440-09-7       | 1    | mg/L | <1                          | 50 mg/L                               | 95.7               | 89.7                  | 108  |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4361412)           |                 |      |      |                             |                                       |                    |                       |      |
| EP231X: Perfluorobutane sulfonic acid (PFBS)                     | 375-73-5        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 105                | 72.0                  | 130  |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)                   | 2706-91-4       | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 114                | 71.0                  | 127  |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)                    | 355-46-4        | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 113                | 68.0                  | 131  |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)                   | 375-92-8        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 118                | 69.0                  | 134  |
| EP231X: Perfluorooctane sulfonic acid (PFOS)                     | 1763-23-1       | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 108                | 65.0                  | 140  |
| EP231X: Perfluorodecane sulfonic acid (PFDS)                     | 335-77-3        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 108                | 53.0                  | 142  |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4361556)           |                 |      |      |                             |                                       |                    |                       |      |
| EP231X: Perfluorobutane sulfonic acid (PFBS)                     | 375-73-5        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 108                | 72.0                  | 130  |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)                   | 2706-91-4       | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 118                | 71.0                  | 127  |



Sub-Matrix: **WATER**

|                                                                           |            |      |      | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                       |      |
|---------------------------------------------------------------------------|------------|------|------|-----------------------------|---------------------------------------|---------------------------|-----------------------|------|
|                                                                           |            |      |      |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%) |      |
| Method: Compound                                                          | CAS Number | LOR  | Unit | Result                      |                                       |                           | Low                   | High |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4361556) - continued</b> |            |      |      |                             |                                       |                           |                       |      |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)                             | 355-46-4   | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 119                       | 68.0                  | 131  |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)                            | 375-92-8   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 110                       | 69.0                  | 134  |
| EP231X: Perfluorooctane sulfonic acid (PFOS)                              | 1763-23-1  | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 107                       | 65.0                  | 140  |
| EP231X: Perfluorodecane sulfonic acid (PFDS)                              | 335-77-3   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 117                       | 53.0                  | 142  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4361412)</b>           |            |      |      |                             |                                       |                           |                       |      |
| EP231X: Perfluorobutanoic acid (PFBA)                                     | 375-22-4   | 0.1  | µg/L | <0.1                        | 1.25 µg/L                             | 98.5                      | 73.0                  | 129  |
| EP231X: Perfluoropentanoic acid (PFPeA)                                   | 2706-90-3  | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 114                       | 72.0                  | 129  |
| EP231X: Perfluorohexanoic acid (PFHxA)                                    | 307-24-4   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 119                       | 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                             | 116                       | 71.0                  | 133  |
| EP231X: Perfluorononanoic acid (PFNA)                                     | 375-95-1   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 115                       | 69.0                  | 130  |
| EP231X: Perfluorodecanoic acid (PFDA)                                     | 335-76-2   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 111                       | 71.0                  | 129  |
| EP231X: Perfluoroundecanoic acid (PFUnDA)                                 | 2058-94-8  | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 118                       | 69.0                  | 133  |
| EP231X: Perfluorododecanoic acid (PFDoDA)                                 | 307-55-1   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 115                       | 72.0                  | 134  |
| EP231X: Perfluorotridecanoic acid (PFTriDA)                               | 72629-94-8 | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 121                       | 65.0                  | 144  |
| EP231X: Perfluorotetradecanoic acid (PFTeDA)                              | 376-06-7   | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 103                       | 71.0                  | 132  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4361556)</b>           |            |      |      |                             |                                       |                           |                       |      |
| 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                             | 115                       | 72.0                  | 129  |
| EP231X: Perfluorohexanoic acid (PFHxA)                                    | 307-24-4   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 119                       | 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                             | 115                       | 71.0                  | 133  |
| EP231X: Perfluorononanoic acid (PFNA)                                     | 375-95-1   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 118                       | 69.0                  | 130  |
| EP231X: Perfluorodecanoic acid (PFDA)                                     | 335-76-2   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 111                       | 71.0                  | 129  |
| EP231X: Perfluoroundecanoic acid (PFUnDA)                                 | 2058-94-8  | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 122                       | 69.0                  | 133  |
| EP231X: Perfluorododecanoic acid (PFDoDA)                                 | 307-55-1   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 125                       | 72.0                  | 134  |
| EP231X: Perfluorotridecanoic acid (PFTriDA)                               | 72629-94-8 | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 130                       | 65.0                  | 144  |
| EP231X: Perfluorotetradecanoic acid (PFTeDA)                              | 376-06-7   | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 111                       | 71.0                  | 132  |
| <b>EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4361412)</b>               |            |      |      |                             |                                       |                           |                       |      |
| EP231X: Perfluorooctane sulfonamide (FOSA)                                | 754-91-6   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 117                       | 67.0                  | 137  |
| EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)                     | 31506-32-8 | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 104                       | 68.0                  | 141  |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)                      | 4151-50-2  | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 86.1                      | 62.6                  | 147  |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)              | 24448-09-7 | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 114                       | 66.0                  | 145  |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)               | 1691-99-2  | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 95.0                      | 57.6                  | 145  |
| EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)         | 2355-31-9  | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 106                       | 65.0                  | 136  |



Sub-Matrix: **WATER**

| Sub-Matrix: WATER                                                 |             |      |      | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |     |
|-------------------------------------------------------------------|-------------|------|------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|-----|
|                                                                   |             |      |      |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |     |
| Method: Compound                                                  | CAS Number  | LOR  | Unit | Result                      |                                       |                           |                                   |     |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4361412) - continued  |             |      |      |                             |                                       |                           |                                   |     |
| EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 99.2                      | 61.0                              | 135 |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4361556)              |             |      |      |                             |                                       |                           |                                   |     |
| EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 115                       | 67.0                              | 137 |
| EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 92.2                      | 68.0                              | 141 |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 84.0                      | 62.6                              | 147 |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 113                       | 66.0                              | 145 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 97.4                      | 57.6                              | 145 |
| EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 119                       | 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 |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4361412)       |             |      |      |                             |                                       |                           |                                   |     |
| EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.05 | µg/L | <0.05                       | 0.25 µg/L                             | 108                       | 63.0                              | 143 |
| EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 27619-97-2  | 0.05 | µg/L | <0.05                       | 0.25 µg/L                             | 108                       | 64.0                              | 140 |
| EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | 39108-34-4  | 0.05 | µg/L | <0.05                       | 0.25 µg/L                             | 116                       | 67.0                              | 138 |
| EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | 120226-60-0 | 0.05 | µg/L | <0.05                       | 0.25 µg/L                             | 106                       | 71.4                              | 144 |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4361556)       |             |      |      |                             |                                       |                           |                                   |     |
| EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.05 | µg/L | <0.05                       | 0.25 µg/L                             | 104                       | 63.0                              | 143 |
| EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 27619-97-2  | 0.05 | µg/L | <0.05                       | 0.25 µg/L                             | 99.0                      | 64.0                              | 140 |
| EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | 39108-34-4  | 0.05 | µg/L | <0.05                       | 0.25 µg/L                             | 109                       | 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                             | 137                       | 71.4                              | 144 |

## Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

|                                                                         |                   |                                              |            | Matrix Spike (MS) Report |                        |                       |      |
|-------------------------------------------------------------------------|-------------------|----------------------------------------------|------------|--------------------------|------------------------|-----------------------|------|
|                                                                         |                   |                                              |            | Spike<br>Concentration   | SpikeRecovery(%)<br>MS | Acceptable Limits (%) |      |
| Laboratory sample ID                                                    | Sample ID         | Method: Compound                             | CAS Number |                          |                        | Low                   | High |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4355327)</b> |                   |                                              |            |                          |                        |                       |      |
| EP2205925-001                                                           | 0960_SW265_220517 | ED041G: Sulfate as SO4 - Turbidimetric       | 14808-79-8 | 100 mg/L                 | 104                    | 70.0                  | 130  |
| <b>ED045G: Chloride by Discrete Analyser (QCLot: 4355326)</b>           |                   |                                              |            |                          |                        |                       |      |
| EP2205925-001                                                           | 0960_SW265_220517 | ED045G: Chloride                             | 16887-00-6 | 1000 mg/L                | 109                    | 70.0                  | 130  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4361412)</b>           |                   |                                              |            |                          |                        |                       |      |
| EP2205864-001                                                           | Anonymous         | EP231X: Perfluorobutane sulfonic acid (PFBS) | 375-73-5   | 0.25 µg/L                | 95.6                   | 72.0                  | 130  |





Sub-Matrix: **WATER**

| 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: 4361412) - continued |           |                                                                   |             |                          |                  |                       |      |
| EP2205864-001                                                      | Anonymous | EP231X: Perfluoropentane sulfonic acid (PFPeS)                    | 2706-91-4   | 0.25 µg/L                | 108              | 71.0                  | 127  |
|                                                                    |           | EP231X: Perfluorohexane sulfonic acid (PFHxS)                     | 355-46-4    | 0.25 µg/L                | 109              | 68.0                  | 131  |
|                                                                    |           | EP231X: Perfluoroheptane sulfonic acid (PFHpS)                    | 375-92-8    | 0.25 µg/L                | 112              | 69.0                  | 134  |
|                                                                    |           | EP231X: Perfluorooctane sulfonic acid (PFOS)                      | 1763-23-1   | 0.25 µg/L                | 105              | 65.0                  | 140  |
|                                                                    |           | EP231X: Perfluorodecane sulfonic acid (PFDS)                      | 335-77-3    | 0.25 µg/L                | 91.8             | 53.0                  | 142  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4361412)           |           |                                                                   |             |                          |                  |                       |      |
| EP2205864-001                                                      | Anonymous | EP231X: Perfluorobutanoic acid (PFBA)                             | 375-22-4    | 1.25 µg/L                | 93.1             | 73.0                  | 129  |
|                                                                    |           | EP231X: Perfluoropentanoic acid (PFPeA)                           | 2706-90-3   | 0.25 µg/L                | 93.8             | 72.0                  | 129  |
|                                                                    |           | EP231X: Perfluorohexanoic acid (PFHxA)                            | 307-24-4    | 0.25 µg/L                | 104              | 72.0                  | 129  |
|                                                                    |           | EP231X: Perfluoroheptanoic acid (PFHpA)                           | 375-85-9    | 0.25 µg/L                | 101              | 72.0                  | 130  |
|                                                                    |           | EP231X: Perfluorooctanoic acid (PFOA)                             | 335-67-1    | 0.25 µg/L                | 104              | 71.0                  | 133  |
|                                                                    |           | EP231X: Perfluorononanoic acid (PFNA)                             | 375-95-1    | 0.25 µg/L                | 109              | 69.0                  | 130  |
|                                                                    |           | EP231X: Perfluorodecanoic acid (PFDA)                             | 335-76-2    | 0.25 µg/L                | 107              | 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                | 111              | 72.0                  | 134  |
|                                                                    |           | EP231X: Perfluorotridecanoic acid (PFTrDA)                        | 72629-94-8  | 0.25 µg/L                | 123              | 65.0                  | 144  |
|                                                                    |           | EP231X: Perfluorotetradecanoic acid (PFTeDA)                      | 376-06-7    | 0.625 µg/L               | 108              | 71.0                  | 132  |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4361412)               |           |                                                                   |             |                          |                  |                       |      |
| EP2205864-001                                                      | Anonymous | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.25 µg/L                | 115              | 67.0                  | 137  |
|                                                                    |           | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.625 µg/L               | 108              | 68.0                  | 141  |
|                                                                    |           | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.625 µg/L               | 89.8             | 62.6                  | 147  |
|                                                                    |           | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.625 µg/L               | 107              | 66.0                  | 145  |
|                                                                    |           | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.625 µg/L               | 97.4             | 57.6                  | 145  |
|                                                                    |           | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9   | 0.25 µg/L                | 109              | 65.0                  | 136  |
|                                                                    |           | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.25 µg/L                | 119              | 61.0                  | 135  |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4361412)        |           |                                                                   |             |                          |                  |                       |      |
| EP2205864-001                                                      | Anonymous | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.25 µg/L                | 122              | 63.0                  | 143  |
|                                                                    |           | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 27619-97-2  | 0.25 µg/L                | 82.4             | 64.0                  | 140  |
|                                                                    |           | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | 39108-34-4  | 0.25 µg/L                | 113              | 67.0                  | 138  |
|                                                                    |           | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | 120226-60-0 | 0.25 µg/L                | 84.2             | 71.4                  | 144  |

## QA/QC Compliance Assessment to assist with Quality Review

|              |                             |                         |                                |
|--------------|-----------------------------|-------------------------|--------------------------------|
| Work Order   | : EP2205925                 | Page                    | : 1 of 6                       |
| Client       | : STANTEC AUSTRALIA PTY LTD | Laboratory              | : Environmental Division Perth |
| Contact      | : [REDACTED]                | Telephone               | : +61-8-9406 1301              |
| Project      | : WA_0960_PFASOMP           | Date Samples Received   | : 20-May-2022                  |
| Site         | : DEF19009/Learmonth        | Issue Date              | : 30-May-2022                  |
| Sampler      | : [REDACTED]                | No. of samples received | : 14                           |
| Order number | : DEF19009/0960             | No. of samples analysed | : 14                           |

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

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

### Summary of Outliers

#### Outliers : Quality Control Samples

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

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- **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<br>Method                | Count |         | Rate (%) |          | Quality Control Specification  |
|------------------------------------------------------|-------|---------|----------|----------|--------------------------------|
|                                                      | QC    | Regular | Actual   | Expected |                                |
| Laboratory Duplicates (DUP)                          |       |         |          |          |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | 2     | 39      | 5.13     | 10.00    | NEPM 2013 B3 & ALS QC Standard |
| Matrix Spikes (MS)                                   |       |         |          |          |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | 1     | 39      | 2.56     | 5.00     | NEPM 2013 B3 & ALS QC Standard |

### Analysis Holding Time Compliance

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

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

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

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

Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                                                                                                           | Sample Date                                                                                                                     | Extraction / Preparation |                    |            | Analysis      |                  |             |   |
|----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------|------------|---------------|------------------|-------------|---|
| Container / Client Sample ID(s)                                                                                                  |                                                                                                                                 | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation  |   |
| ED037P: Alkalinity by PC Titrator                                                                                                |                                                                                                                                 |                          |                    |            |               |                  |             |   |
| Clear Plastic Bottle - Natural (ED037-P)                                                                                         |                                                                                                                                 |                          |                    |            |               |                  |             |   |
| 0960_SW265_220517,<br>0960_SW189_220517,<br>0960_SW157_220517,<br>0960_SW298_220517,<br>0960_SW301_220517,<br>0960_SW208_220517, | 0960_SW170_220517,<br>0960_SW190_220517,<br>0960_SW219_220517,<br>0960_QC108_220517,<br>0960_SW205_220517,<br>0960_QC109_220517 | 17-May-2022              | ----               | ----       | ----          | 26-May-2022      | 31-May-2022 | ✓ |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA                                                                                  |                                                                                                                                 |                          |                    |            |               |                  |             |   |
| Clear Plastic Bottle - Natural (ED041G)                                                                                          |                                                                                                                                 |                          |                    |            |               |                  |             |   |
| 0960_SW265_220517,<br>0960_SW189_220517,<br>0960_SW157_220517,<br>0960_SW298_220517,<br>0960_SW301_220517,<br>0960_SW208_220517, | 0960_SW170_220517,<br>0960_SW190_220517,<br>0960_SW219_220517,<br>0960_QC108_220517,<br>0960_SW205_220517,<br>0960_QC109_220517 | 17-May-2022              | ----               | ----       | ----          | 24-May-2022      | 14-Jun-2022 | ✓ |
| ED045G: Chloride by Discrete Analyser                                                                                            |                                                                                                                                 |                          |                    |            |               |                  |             |   |
| Clear Plastic Bottle - Natural (ED045G)                                                                                          |                                                                                                                                 |                          |                    |            |               |                  |             |   |
| 0960_SW265_220517,<br>0960_SW189_220517,<br>0960_SW157_220517,<br>0960_SW298_220517,<br>0960_SW301_220517,<br>0960_SW208_220517, | 0960_SW170_220517,<br>0960_SW190_220517,<br>0960_SW219_220517,<br>0960_QC108_220517,<br>0960_SW205_220517,<br>0960_QC109_220517 | 17-May-2022              | ----               | ----       | ----          | 24-May-2022      | 14-Jun-2022 | ✓ |



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                  |                    | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |
|-----------------------------------------|--------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|
| Container / Client Sample ID(s)         |                    |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| ED093F: Dissolved Major Cations         |                    |             |                          |                    |            |               |                  |            |
| Clear Plastic Bottle - Natural (ED093F) |                    | 17-May-2022 | ----                     | ----               | ----       | 24-May-2022   | 24-May-2022      | ✓          |
| 0960_SW265_220517,                      | 0960_SW170_220517, |             |                          |                    |            |               |                  |            |
| 0960_SW189_220517,                      | 0960_SW190_220517, |             |                          |                    |            |               |                  |            |
| 0960_SW157_220517,                      | 0960_SW219_220517, |             |                          |                    |            |               |                  |            |
| 0960_SW298_220517,                      | 0960_QC108_220517, |             |                          |                    |            |               |                  |            |
| 0960_SW301_220517,                      | 0960_SW205_220517, |             |                          |                    |            |               |                  |            |
| 0960_SW208_220517,                      | 0960_QC109_220517  |             |                          |                    |            |               |                  |            |
| EP231A: Perfluoroalkyl Sulfonic Acids   |                    |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                 |                    | 17-May-2022 | 27-May-2022              | 13-Nov-2022        | ✓          | 27-May-2022   | 13-Nov-2022      | ✓          |
| 0960_SW265_220517,                      | 0960_SW170_220517, |             |                          |                    |            |               |                  |            |
| 0960_SW189_220517,                      | 0960_SW190_220517, |             |                          |                    |            |               |                  |            |
| 0960_SW157_220517,                      | 0960_SW219_220517, |             |                          |                    |            |               |                  |            |
| 0960_SW298_220517,                      | 0960_QC108_220517, |             |                          |                    |            |               |                  |            |
| 0960_SW301_220517,                      | 0960_SW205_220517, |             |                          |                    |            |               |                  |            |
| 0960_SW208_220517,                      | 0960_QC109_220517, |             |                          |                    |            |               |                  |            |
| 0960_QC301_220517,                      | 0960_QC401_220517  |             |                          |                    |            |               |                  |            |
| EP231B: Perfluoroalkyl Carboxylic Acids |                    |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                 |                    | 17-May-2022 | 27-May-2022              | 13-Nov-2022        | ✓          | 27-May-2022   | 13-Nov-2022      | ✓          |
| 0960_SW265_220517,                      | 0960_SW170_220517, |             |                          |                    |            |               |                  |            |
| 0960_SW189_220517,                      | 0960_SW190_220517, |             |                          |                    |            |               |                  |            |
| 0960_SW157_220517,                      | 0960_SW219_220517, |             |                          |                    |            |               |                  |            |
| 0960_SW298_220517,                      | 0960_QC108_220517, |             |                          |                    |            |               |                  |            |
| 0960_SW301_220517,                      | 0960_SW205_220517, |             |                          |                    |            |               |                  |            |
| 0960_SW208_220517,                      | 0960_QC109_220517, |             |                          |                    |            |               |                  |            |
| 0960_QC301_220517,                      | 0960_QC401_220517  |             |                          |                    |            |               |                  |            |
| EP231C: Perfluoroalkyl Sulfonamides     |                    |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                 |                    | 17-May-2022 | 27-May-2022              | 13-Nov-2022        | ✓          | 27-May-2022   | 13-Nov-2022      | ✓          |
| 0960_SW265_220517,                      | 0960_SW170_220517, |             |                          |                    |            |               |                  |            |
| 0960_SW189_220517,                      | 0960_SW190_220517, |             |                          |                    |            |               |                  |            |
| 0960_SW157_220517,                      | 0960_SW219_220517, |             |                          |                    |            |               |                  |            |
| 0960_SW298_220517,                      | 0960_QC108_220517, |             |                          |                    |            |               |                  |            |
| 0960_SW301_220517,                      | 0960_SW205_220517, |             |                          |                    |            |               |                  |            |
| 0960_SW208_220517,                      | 0960_QC109_220517, |             |                          |                    |            |               |                  |            |
| 0960_QC301_220517,                      | 0960_QC401_220517  |             |                          |                    |            |               |                  |            |

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                     |                    | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |
|--------------------------------------------|--------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|
| Container / Client Sample ID(s)            |                    |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids |                    |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                    |                    | 17-May-2022 | 27-May-2022              | 13-Nov-2022        | ✓          | 27-May-2022   | 13-Nov-2022      | ✓          |
| 0960_SW265_220517,                         | 0960_SW170_220517, |             |                          |                    |            |               |                  |            |
| 0960_SW189_220517,                         | 0960_SW190_220517, |             |                          |                    |            |               |                  |            |
| 0960_SW157_220517,                         | 0960_SW219_220517, |             |                          |                    |            |               |                  |            |
| 0960_SW298_220517,                         | 0960_QC108_220517, |             |                          |                    |            |               |                  |            |
| 0960_SW301_220517,                         | 0960_SW205_220517, |             |                          |                    |            |               |                  |            |
| 0960_SW208_220517,                         | 0960_QC109_220517, |             |                          |                    |            |               |                  |            |
| 0960_QC301_220517,                         | 0960_QC401_220517  |             |                          |                    |            |               |                  |            |
| EP231P: PFAS Sums                          |                    |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                    |                    | 17-May-2022 | 27-May-2022              | 13-Nov-2022        | ✓          | 27-May-2022   | 13-Nov-2022      | ✓          |
| 0960_SW265_220517,                         | 0960_SW170_220517, |             |                          |                    |            |               |                  |            |
| 0960_SW189_220517,                         | 0960_SW190_220517, |             |                          |                    |            |               |                  |            |
| 0960_SW157_220517,                         | 0960_SW219_220517, |             |                          |                    |            |               |                  |            |
| 0960_SW298_220517,                         | 0960_QC108_220517, |             |                          |                    |            |               |                  |            |
| 0960_SW301_220517,                         | 0960_SW205_220517, |             |                          |                    |            |               |                  |            |
| 0960_SW208_220517,                         | 0960_QC109_220517, |             |                          |                    |            |               |                  |            |
| 0960_QC301_220517,                         | 0960_QC401_220517  |             |                          |                    |            |               |                  |            |



## Quality Control Parameter Frequency Compliance

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

Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

| Quality Control Sample Type                            |         | Count |         | Rate (%) |          |            | Quality Control Specification  |
|--------------------------------------------------------|---------|-------|---------|----------|----------|------------|--------------------------------|
| Analytical Methods                                     | Method  | QC    | Regular | Actual   | Expected | Evaluation |                                |
|                                                        |         |       |         |          |          |            |                                |
| Laboratory Duplicates (DUP)                            |         |       |         |          |          |            |                                |
| Alkalinity by Auto Titrator                            | ED037-P | 4     | 40      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 2     | 39      | 5.13     | 10.00    | ✗          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Laboratory Control Samples (LCS)                       |         |       |         |          |          |            |                                |
| Alkalinity by Auto Titrator                            | ED037-P | 4     | 40      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 2     | 39      | 5.13     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Method Blanks (MB)                                     |         |       |         |          |          |            |                                |
| Alkalinity by Auto Titrator                            | ED037-P | 2     | 40      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 2     | 39      | 5.13     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Matrix Spikes (MS)                                     |         |       |         |          |          |            |                                |
| Chloride by Discrete Analyser                          | ED045G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 39      | 2.56     | 5.00     | ✗          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |





## Brief Method Summaries

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

| Analytical Methods                                                 | Method       | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------------------|--------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alkalinity by Auto Titrator                                        | ED037-P      | WATER  | In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                                                                                                                                                                                                                |
| Sulfate (Turbidimetric) as SO <sub>4</sub> 2- by Discrete Analyser | ED041G       | WATER  | In house: Referenced to APHA 4500-SO <sub>4</sub> . Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO <sub>4</sub> suspension is measured by a photometer and the SO <sub>4</sub> -2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                         |
| Chloride by Discrete Analyser                                      | ED045G       | WATER  | In house: Referenced to APHA 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm.                                                                                                                                                                                                                                                                                                                                                                |
| Major Cations - Dissolved                                          | ED093F       | WATER  | In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                           |
| Ionic Balance by PCT DA and Turbi SO <sub>4</sub> DA               | * EN055 - PG | WATER  | In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS               | EP231X       | WATER  | In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements. |
| Preparation Methods                                                | Method       | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Solid Phase Extraction (SPE) for PFAS in water                     | ORG72        | WATER  | In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.                                                                                                                                                                                                |

**CHAIN OF CUSTODY**

COC#: 37676

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: DEF19009/Learmonth SED - MGMB

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:  
/ ES2019CARBSD0002**SAMPLE DETAILS****ANALYSIS REQUIRED**

| SAMPLE | NAME       | DESCRIPTION | DATE / TIME            | MATRIX | TOTAL BOTTLES        | ON HOLD | Analysis NOT REQUIRED | Sediments SEDIMENT | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|------------|-------------|------------------------|--------|----------------------|---------|-----------------------|--------------------|----------------------|------------------------|
| 001    | 0960_SS125 |             | 17/05/2022<br>08:32 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      |                       | Partial<br>1/4     |                      |                        |
| 002    | 0960_SS276 |             | 17/05/2022<br>08:33 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      |                       | Partial<br>1/4     |                      |                        |
| 003    | 0960_SS122 |             | 17/05/2022<br>08:41 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      |                       | Partial<br>1/4     |                      |                        |
| 004    | 0960_QC105 |             | 17/05/2022<br>08:43 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      |                       | Partial<br>1/4     |                      |                        |
| 005    | 0960_SS121 |             | 17/05/2022<br>08:48 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      |                       | Partial<br>1/4     |                      |                        |
| 006    | 0960_SS124 |             | 17/05/2022<br>08:49 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      |                       | Partial<br>1/4     |                      |                        |
| 007    | 0960_SS277 |             | 17/05/2022<br>08:50 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      |                       | Partial<br>1/4     |                      |                        |
| 008    | 0960_SS123 |             | 17/05/2022<br>08:55 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      |                       | Partial<br>1/4     |                      |                        |
| 009    | 0960_SS114 |             | 17/05/2022<br>09:09 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      |                       | Partial<br>1/4     |                      |                        |



# CHAIN OF CUSTODY

ALS COC#: 37676

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: DEF19009/Learmonth SED - MGMB

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:  
/ ES2019CARBSD0002

## LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes 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 | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|------------|-------------|------------------------|--------|----------------------|---------|-----------------------|--------------------|----------------------|------------------------|
| 010    | 0960_SS113 |             | 17/05/2022<br>09:09 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      |                       | Partial<br>1/4     |                      |                        |
| 011    | 0960_SS235 |             | 17/05/2022<br>09:18 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      |                       | Partial<br>1/4     |                      |                        |
| 012    | 0960_SS234 |             | 17/05/2022<br>09:19 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      |                       | Partial<br>1/4     |                      |                        |
| 013    | 0960_SS231 |             | 17/05/2022<br>09:25 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      |                       | Partial<br>1/4     |                      |                        |
| 014    | 0960_SS265 |             | 17/05/2022<br>09:34 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      |                       | Partial<br>1/4     |                      |                        |
| 015    | 0960_QC106 |             | 17/05/2022<br>09:35 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      |                       | Partial<br>1/4     |                      |                        |
| 016    | 0960_SS170 |             | 17/05/2022<br>09:48 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      |                       | Partial<br>1/4     |                      |                        |
| 017    | 0960_SS108 |             | 17/05/2022<br>09:50 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      |                       | Partial<br>1/4     |                      |                        |
| 018    | 0960_SS200 |             | 17/05/2022<br>10:41 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      |                       | Partial<br>1/4     |                      |                        |



# CHAIN OF CUSTODY

COC#: 37676

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: DEF19009/Learmonth SED - MGMB

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:  
/ ES2019CARBSD0002

## SAMPLE DETAILS

## ANALYSIS REQUIRED

| SAMPLE | NAME       | DESCRIPTION | DATE / TIME            | MATRIX | TOTAL BOTTLES        | ON HOLD | Analysis NOT REQUIRED | Sediments SEDIMENT | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|------------|-------------|------------------------|--------|----------------------|---------|-----------------------|--------------------|----------------------|------------------------|
| 019    | 0960_QC107 |             | 17/05/2022<br>10:42 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      |                       | Partial<br>1/4     |                      |                        |
| 020    | 0960_SD199 |             | 17/05/2022<br>10:47 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      |                       | Partial<br>1/4     |                      |                        |
| 021    | 0960_SS227 |             | 17/05/2022<br>10:48 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      |                       | Partial<br>1/4     |                      |                        |
| 022    | 0960_SS189 |             | 17/05/2022<br>10:59 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      |                       | Partial<br>1/4     |                      |                        |
| 023    | 0960_SS190 |             | 17/05/2022<br>11:07 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      |                       | Partial<br>1/4     |                      |                        |
| 024    | 0960_SS291 |             | 17/05/2022<br>11:23 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      |                       | Partial<br>1/4     |                      |                        |
| 025    | 0960_SS174 |             | 17/05/2022<br>12:00 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      |                       | Partial<br>1/4     |                      |                        |
| 026    | 0960_SS243 |             | 17/05/2022<br>12:04 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      |                       | Partial<br>1/4     |                      |                        |
| 027    | 0960_SD219 |             | 17/05/2022<br>12:06 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      |                       | Partial<br>1/4     |                      |                        |



# CHAIN OF CUSTODY

ALS COC#: 37676

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: DEF19009/Learmonth SED - MGMB

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:  
/ ES2019CARBSD0002

## SAMPLE DETAILS

## ANALYSIS REQUIRED

| SAMPLE | NAME       | DESCRIPTION | DATE / TIME            | MATRIX | TOTAL BOTTLES        | ON HOLD | Analysis NOT REQUIRED | Sediments SEDIMENT | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|------------|-------------|------------------------|--------|----------------------|---------|-----------------------|--------------------|----------------------|------------------------|
| 028    | 0960_SS157 |             | 17/05/2022<br>12:07 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      |                       | Partial<br>1/4     |                      |                        |
| 029    | 0960_SD205 |             | 17/05/2022<br>04:16 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      |                       | Partial<br>1/4     |                      |                        |
| 030    | 0960_SS301 |             | 17/05/2022<br>04:18 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      |                       | Partial<br>1/4     |                      |                        |
| 031    | 0960_SS279 |             | 17/05/2022<br>04:19 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      |                       | Partial<br>1/4     |                      |                        |
| 032    | 0960_SD208 |             | 17/05/2022<br>04:20 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      |                       | Partial<br>1/4     |                      |                        |
| 033    | 0960_SS168 |             | 17/05/2022<br>04:21 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      |                       | Partial<br>1/4     |                      |                        |
| 034    | 0960_SS298 |             | 17/05/2022<br>04:22 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      |                       | Partial<br>1/4     |                      |                        |
| 035    | 0960_SS176 |             | 17/05/2022<br>04:23 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      |                       |                    |                      |                        |
| 036    | 0960_SS166 |             | 17/05/2022<br>04:23 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      |                       | Partial<br>1/4     |                      |                        |



# CHAIN OF CUSTODY

COC#: 37676

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: DEF19009/Learmonth SED - MGMB

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:  
/ ES2019CARBSD0002

| SAMPLE | SAMPLE NAME | PARTIAL ANALYSIS GROUP NAME | MATRIX | SELECTED ANALYSIS NAME                            |
|--------|-------------|-----------------------------|--------|---------------------------------------------------|
| 001    | 0960_SS125  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 002    | 0960_SS276  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 003    | 0960_SS122  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 004    | 0960_QC105  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 005    | 0960_SS121  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 006    | 0960_SS124  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 007    | 0960_SS277  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 008    | 0960_SS123  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 009    | 0960_SS114  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 010    | 0960_SS113  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 011    | 0960_SS235  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 012    | 0960_SS234  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 013    | 0960_SS231  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 014    | 0960_SS265  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 015    | 0960_QC106  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |





# CHAIN OF CUSTODY

COC#: 37676

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: DEF19009/Learmonth SED - MGMB

ORDER NO: DEF19009/0960

PROJECT MANAGER:

PRIMARY SAMPLER:

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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:

SAMPLER MOBILE:  
/ ES2019CARBSD0002

## LABORATORY USE ONLY (Circle)

Custody Seal intact? 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 | 0960_SS170 | Sediments SEDIMENT | Soil | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 017 | 0960_SS108 | Sediments SEDIMENT | Soil | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 018 | 0960_SS200 | Sediments SEDIMENT | Soil | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 019 | 0960_QC107 | Sediments SEDIMENT | Soil | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 020 | 0960_SD199 | Sediments SEDIMENT | Soil | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 021 | 0960_SS227 | Sediments SEDIMENT | Soil | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 022 | 0960_SS189 | Sediments SEDIMENT | Soil | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 023 | 0960_SS190 | Sediments SEDIMENT | Soil | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 024 | 0960_SS291 | Sediments SEDIMENT | Soil | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 025 | 0960_SS174 | Sediments SEDIMENT | Soil | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 026 | 0960_SS243 | Sediments SEDIMENT | Soil | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 027 | 0960_SD219 | Sediments SEDIMENT | Soil | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 028 | 0960_SS157 | Sediments SEDIMENT | Soil | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 029 | 0960_SD205 | Sediments SEDIMENT | Soil | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 030 | 0960_SS301 | Sediments SEDIMENT | Soil | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 031 | 0960_SS279 | Sediments SEDIMENT | Soil | - EP231X (solids) PFAS - Full Suite (28 analytes) |

**CHAIN OF CUSTODY**

COC#: 37676

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: DEF19009/Learmonth SED - MGMB

ORDER NO: DEF19009/0960

PROJECT MANAGER:

PRIMARY SAMPLER:

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DATE TIME:

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DATE TIME:

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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:

SAMPLER MOBILE:  
/ ES2019CARBSD0002

| SAMPLE | SAMPLE NAME | BOTTLE NAME   | VOLUME | BARCODE        | TYPE | FILTERED | REASON |
|--------|-------------|---------------|--------|----------------|------|----------|--------|
| 001    | 0960_SS125  | HDPE Soil Jar | 200 mL | 00621019098508 | Grey | No       |        |
| 002    | 0960_SS276  | HDPE Soil Jar | 200 mL | 00621019098413 | Grey | No       |        |
| 003    | 0960_SS122  | HDPE Soil Jar | 200 mL | 00621019098443 | Grey | No       |        |
| 004    | 0960_QC105  | HDPE Soil Jar | 200 mL | 00621019074653 | Grey | No       |        |
| 005    | 0960_SS121  | HDPE Soil Jar | 200 mL | 00621019098423 | Grey | No       |        |
| 006    | 0960_SS124  | HDPE Soil Jar | 200 mL | 00621019098501 | Grey | No       |        |
| 007    | 0960_SS277  | HDPE Soil Jar | 200 mL | 00621019098460 | Grey | No       |        |
| 008    | 0960_SS123  | HDPE Soil Jar | 200 mL | 00621019074618 | Grey | No       |        |
| 009    | 0960_SS114  | HDPE Soil Jar | 200 mL | 00621019098454 | Grey | No       |        |
| 010    | 0960_SS113  | HDPE Soil Jar | 200 mL | 00621019098514 | Grey | No       |        |
| 011    | 0960_SS235  | HDPE Soil Jar | 200 mL | 00621019074671 | Grey | No       |        |
| 012    | 0960_SS234  | HDPE Soil Jar | 200 mL | 00621019098516 | Grey | No       |        |
| 013    | 0960_SS231  | HDPE Soil Jar | 200 mL | 00620719085999 | Grey | No       |        |
| 014    | 0960_SS265  | HDPE Soil Jar | 200 mL | 00621019074688 | Grey | No       |        |
| 015    | 0960_QC106  | HDPE Soil Jar | 200 mL | 00621019098439 | Grey | No       |        |
| 016    | 0960_SS170  | HDPE Soil Jar | 200 mL | 00621019098456 | Grey | No       |        |
| 017    | 0960_SS108  | HDPE Soil Jar | 200 mL | 00621019098472 | Grey | No       |        |
| 018    | 0960_SS200  | HDPE Soil Jar | 200 mL | 00621019098382 | Grey | No       |        |
| 019    | 0960_QC107  | HDPE Soil Jar | 200 mL | 00621019098512 | Grey | No       |        |
| 020    | 0960_SD199  | HDPE Soil Jar | 200 mL | 00621019098389 | Grey | No       |        |
| 021    | 0960_SS227  | HDPE Soil Jar | 200 mL | 00621019099158 | Grey | No       |        |
| 022    | 0960_SS189  | HDPE Soil Jar | 200 mL | 00620719085903 | Grey | No       |        |
| 023    | 0960_SS190  | HDPE Soil Jar | 200 mL | 00621019074684 | Grey | No       |        |
| 024    | 0960_SS291  | HDPE Soil Jar | 200 mL | 00621019098489 | Grey | No       |        |
| 025    | 0960_SS174  | HDPE Soil Jar | 200 mL | 00621019074711 | Grey | No       |        |
| 026    | 0960_SS243  | HDPE Soil Jar | 200 mL | 00621019098449 | Grey | No       |        |



# CHAIN OF CUSTODY

COC#: 37676

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: DEF19009/Learmonth SED - MGMB

ORDER NO: DEF19009/0960

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

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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:

SAMPLER MOBILE:  
/ ES2019CARBSD0002

|     |            |               |        |                |      |    |  |
|-----|------------|---------------|--------|----------------|------|----|--|
| 027 | 0960_SD219 | HDPE Soil Jar | 200 mL | 00621019098500 | Grey | No |  |
| 028 | 0960_SS157 | HDPE Soil Jar | 200 mL | 00621019098400 | Grey | No |  |
| 029 | 0960_SD205 | HDPE Soil Jar | 200 mL | 00621019097713 | Grey | No |  |
| 030 | 0960_SS301 | HDPE Soil Jar | 200 mL | 00620719063110 | Grey | No |  |
| 031 | 0960_SS279 | HDPE Soil Jar | 200 mL | 00621019097721 | Grey | No |  |
| 032 | 0960_SD208 | HDPE Soil Jar | 200 mL | 00621019097757 | Grey | No |  |
| 033 | 0960_SS168 | HDPE Soil Jar | 200 mL | 00620719063185 | Grey | No |  |
| 034 | 0960_SS298 | HDPE Soil Jar | 200 mL | 00620719063138 | Grey | No |  |
| 035 | 0960_SS176 | HDPE Soil Jar | 200 mL | 00621019097751 | Grey | No |  |
| 036 | 0960_SS166 | HDPE Soil Jar | 200 mL | 00621019074623 | Grey | No |  |

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

## SAMPLE RECEIPT NOTIFICATION (SRN)

**Work Order : EP2205953**

|                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Client : <b>STANTEC AUSTRALIA PTY LTD</b></p> <p>Contact : [REDACTED]</p> <p>Address : GROUND FLOOR 226 ADELAIDE TERRACE<br/>PERTH 6000</p> <p>E-mail : [REDACTED]@cardno.com.au</p> <p>Telephone : ----</p> <p>Facsimile : ----</p> <p>Project : WA_0960_PFASOMP</p> <p>Order number : DEF19009/0960</p> <p>C-O-C number : 37676</p> <p>Site : DEF19009/Learmonth</p> <p>Sampler : [REDACTED]</p> | <p>Laboratory : Environmental Division Perth</p> <p>Contact : Customer Services EP</p> <p>Address : 26 Rigali Way Wangara WA Australia 6065</p> <p>E-mail : ALSEnviro.Perth@alsglobal.com</p> <p>Telephone : +61-8-9406 1301</p> <p>Facsimile : +61-8-9406 1399</p> <p>Page : 1 of 3</p> <p>Quote number : ES2022MWHAUS0002 (SY/139/19 B)</p> <p>QC Level : NEPM 2013 B3 &amp; ALS QC Standard</p> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Dates

|                                                                                                        |                                                                                      |
|--------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <p>Date Samples Received : 20-May-2022 11:30</p> <p>Client Requested Due : 01-Jun-2022</p> <p>Date</p> | <p>Issue Date : 23-May-2022</p> <p>Scheduled Reporting Date : <b>01-Jun-2022</b></p> |
|--------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|

### Delivery Details

|                                                                                           |                                                                                                                                  |
|-------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| <p>Mode of Delivery : Carrier</p> <p>No. of coolers/boxes : 2</p> <p>Receipt Detail :</p> | <p>Security Seal : Not Available</p> <p>Temperature : 21.5 - Ice present</p> <p>No. of samples received / analysed : 36 / 35</p> |
|-------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|

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



## Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exists.

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: SOIL

| Laboratory sample ID | Sampling date / time | Sample ID         | (On Hold) SOIL<br>No analysis requested | SOIL - EA055-103<br>Moisture Content | SOIL - EP231X (solids)<br>PFAS - Full Suite (28 analytes) |
|----------------------|----------------------|-------------------|-----------------------------------------|--------------------------------------|-----------------------------------------------------------|
| EP2205953-001        | 17-May-2022 08:32    | 0960_SS125_220517 |                                         | ✓                                    | ✓                                                         |
| EP2205953-002        | 17-May-2022 08:33    | 0960_SS276_220517 |                                         | ✓                                    | ✓                                                         |
| EP2205953-003        | 17-May-2022 08:41    | 0960_SS122_220517 |                                         | ✓                                    | ✓                                                         |
| EP2205953-004        | 17-May-2022 08:43    | 0960_QC105_220517 |                                         | ✓                                    | ✓                                                         |
| EP2205953-005        | 17-May-2022 08:48    | 0960_SS121_220517 |                                         | ✓                                    | ✓                                                         |
| EP2205953-006        | 17-May-2022 08:49    | 0960_SS124_220517 |                                         | ✓                                    | ✓                                                         |
| EP2205953-007        | 17-May-2022 08:50    | 0960_SS277_220517 |                                         | ✓                                    | ✓                                                         |
| EP2205953-008        | 17-May-2022 08:55    | 0960_SS123_220517 |                                         | ✓                                    | ✓                                                         |
| EP2205953-009        | 17-May-2022 09:09    | 0960_SS114_220517 |                                         | ✓                                    | ✓                                                         |
| EP2205953-010        | 17-May-2022 09:09    | 0960_SS113_220517 |                                         | ✓                                    | ✓                                                         |
| EP2205953-011        | 17-May-2022 09:18    | 0960_SS235_220517 |                                         | ✓                                    | ✓                                                         |
| EP2205953-012        | 17-May-2022 09:19    | 0960_SS234_220517 |                                         | ✓                                    | ✓                                                         |
| EP2205953-013        | 17-May-2022 09:25    | 0960_SS231_220517 |                                         | ✓                                    | ✓                                                         |
| EP2205953-014        | 17-May-2022 09:34    | 0960_SS265_220517 |                                         | ✓                                    | ✓                                                         |
| EP2205953-015        | 17-May-2022 09:35    | 0960_QC106_220517 |                                         | ✓                                    | ✓                                                         |
| EP2205953-016        | 17-May-2022 09:48    | 0960_SS170_220517 |                                         | ✓                                    | ✓                                                         |
| EP2205953-017        | 17-May-2022 09:50    | 0960_SS108_220517 |                                         | ✓                                    | ✓                                                         |
| EP2205953-018        | 17-May-2022 10:41    | 0960_SS200_220517 |                                         | ✓                                    | ✓                                                         |
| EP2205953-019        | 17-May-2022 10:42    | 0960_QC107_220517 |                                         | ✓                                    | ✓                                                         |
| EP2205953-020        | 17-May-2022 10:47    | 0960_SD199_220517 |                                         | ✓                                    | ✓                                                         |
| EP2205953-021        | 17-May-2022 10:48    | 0960_SS227_220517 |                                         | ✓                                    | ✓                                                         |
| EP2205953-022        | 17-May-2022 10:59    | 0960_SS189_220517 |                                         | ✓                                    | ✓                                                         |
| EP2205953-023        | 17-May-2022 11:07    | 0960_SS190_220517 |                                         | ✓                                    | ✓                                                         |
| EP2205953-024        | 17-May-2022 11:23    | 0960_SS291_220517 |                                         | ✓                                    | ✓                                                         |
| EP2205953-025        | 17-May-2022 12:00    | 0960_SS174_220517 |                                         | ✓                                    | ✓                                                         |
| EP2205953-026        | 17-May-2022 12:04    | 0960_SS243_220517 |                                         | ✓                                    | ✓                                                         |
| EP2205953-027        | 17-May-2022 12:06    | 0960_SD219_220517 |                                         | ✓                                    | ✓                                                         |
| EP2205953-028        | 17-May-2022 12:07    | 0960_SS157_220517 |                                         | ✓                                    | ✓                                                         |
| EP2205953-029        | 17-May-2022 16:16    | 0960_SD205_220517 |                                         | ✓                                    | ✓                                                         |
| EP2205953-030        | 17-May-2022 16:18    | 0960_SS301_220517 |                                         | ✓                                    | ✓                                                         |
| EP2205953-031        | 17-May-2022 16:19    | 0960_SS279_220517 |                                         | ✓                                    | ✓                                                         |
| EP2205953-032        | 17-May-2022 16:20    | 0960_SD208_220517 |                                         | ✓                                    | ✓                                                         |
| EP2205953-033        | 17-May-2022 16:21    | 0960_SS168_220517 |                                         | ✓                                    | ✓                                                         |
| EP2205953-034        | 17-May-2022 16:22    | 0960_SS298_220517 |                                         | ✓                                    | ✓                                                         |
| EP2205953-035        | 17-May-2022 16:23    | 0960_SS176_220517 | ✓                                       |                                      |                                                           |



|               |                   |                   | (On Hold) SOIL<br>No analysis requested | SOIL - EA055-103<br>Moisture Content | SOIL - EP231X (solids)<br>PFAS - Full Suite (28 analytes) |
|---------------|-------------------|-------------------|-----------------------------------------|--------------------------------------|-----------------------------------------------------------|
| EP2205953-036 | 17-May-2022 16:23 | 0960_SS166_220517 |                                         | ✓                                    | ✓                                                         |

## Proactive Holding Time Report

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

## Requested Deliverables

|                                                                                                                                                                                                                                                                                                                                                    |       |                               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------------------------------|
| <b>DERP LAB REPORTS</b><br>- A4 - AU Tax Invoice (INV)<br>- EDI Format - ESDAT (ESDAT)                                                                                                                                                                                                                                                             | Email | cardno.com.au                 |
|                                                                                                                                                                                                                                                                                                                                                    | Email | derp.labreports@esdat.com.au  |
| <b>PERTH</b><br>- *AU Certificate of Analysis - NATA (COA)<br>- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)<br>- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)<br>- A4 - AU Sample Receipt Notification - Environmental HT (SRN)<br>- Chain of Custody (CoC) (COC)<br>- EDI Format - ESDAT (ESDAT)<br>- EDI Format - XTab (XTAB) | Email | cardno.com.au                 |
|                                                                                                                                                                                                                                                                                                                                                    | Email | cardno.com.au                 |
|                                                                                                                                                                                                                                                                                                                                                    | Email | cardno.com.au                 |
|                                                                                                                                                                                                                                                                                                                                                    | Email | cardno.com.au                 |
|                                                                                                                                                                                                                                                                                                                                                    | Email | cardno.com.au                 |
|                                                                                                                                                                                                                                                                                                                                                    | Email | cardno.com.au                 |
| <b>RICCARDO DIVITA</b><br>- A4 - AU Tax Invoice (INV)                                                                                                                                                                                                                                                                                              | Email | perth@cardno.com.au           |
|                                                                                                                                                                                                                                                                                                                                                    | Email | Riccardo.divita@cardno.com.au |



## CERTIFICATE OF ANALYSIS

**Work Order** : **EP2205953**  
**Client** : **STANTEC AUSTRALIA PTY LTD**  
**Contact** : [REDACTED]  
**Address** : GROUND FLOOR 226 ADELAIDE TERRACE  
 PERTH 6000  
**Telephone** : ----  
**Project** : WA\_0960\_PFASOMP  
**Order number** : DEF19009/0960  
**C-O-C number** : 37676  
**Sampler** : [REDACTED]  
**Site** : DEF19009/Learmonth  
**Quote number** : SY/139/19 B  
**No. of samples received** : 36  
**No. of samples analysed** : 35

**Page** : 1 of 17  
**Laboratory** : Environmental Division Perth  
**Contact** : Customer Services EP  
**Address** : 26 Rigali Way Wangara Western Australia Australia 6065  
**Telephone** : +61-8-9406 1301  
**Date Samples Received** : 20-May-2022 11:30  
**Date Analysis Commenced** : 29-May-2022  
**Issue Date** : 01-Jun-2022 10:16



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>      |
|------------------------------------------------------------------------|------------------|------------------------------------|
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator | Sydney Inorganics, Smithfield, NSW |
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator | Sydney Organics, Smithfield, NSW   |



## 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.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- 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

| Sub-Matrix: SEDIMENT<br>(Matrix: SOIL)        |            |        |       | Sample ID         | 0960_SS125_220517 | 0960_SS276_220517 | 0960_SS122_220517 | 0960_SS121_220517 | 0960_SS124_220517 |
|-----------------------------------------------|------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                          |            |        |       | 17-May-2022 08:32 | 17-May-2022 08:33 | 17-May-2022 08:41 | 17-May-2022 08:48 | 17-May-2022 08:49 |                   |
| Compound                                      | CAS Number | LOR    | Unit  | EP2205953-001     | EP2205953-002     | EP2205953-003     | EP2205953-005     | EP2205953-006     |                   |
|                                               |            |        |       | Result            | Result            | Result            | Result            | Result            |                   |
| EA055: Moisture Content (Dried @ 105-110°C)   |            |        |       |                   |                   |                   |                   |                   |                   |
| Moisture Content                              | ----       | 0.1    | %     | 5.3               | 9.5               | 5.1               | 16.6              | 6.0               |                   |
| EP231A: Perfluoroalkyl Sulfonic Acids         |            |        |       |                   |                   |                   |                   |                   |                   |
| Perfluorobutane sulfonic acid (PFBS)          | 375-73-5   | 0.0002 | mg/kg | <0.0002           | <0.0002           | <0.0002           | <0.0002           | <0.0002           |                   |
| Perfluoropentane sulfonic acid (PFPeS)        | 2706-91-4  | 0.0002 | mg/kg | <0.0002           | <0.0002           | <0.0002           | <0.0002           | <0.0002           |                   |
| Perfluorohexane sulfonic acid (PFHxS)         | 355-46-4   | 0.0002 | mg/kg | <0.0002           | <0.0002           | 0.0009            | 0.0005            | <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 | 0.0005            | 0.0007            | 0.0036            | 0.0891            | 0.0022            |                   |
| Perfluorodecane sulfonic acid (PFDS)          | 335-77-3   | 0.0002 | mg/kg | <0.0002           | <0.0002           | <0.0002           | 0.0121            | <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           | 0.0003            | <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           | 0.0014            | <0.0002           |                   |
| Perfluoroundecanoic acid (PFUnDA)             | 2058-94-8  | 0.0002 | mg/kg | <0.0002           | <0.0002           | <0.0002           | 0.0011            | <0.0002           |                   |
| Perfluorododecanoic acid (PFDoDA)             | 307-55-1   | 0.0002 | mg/kg | <0.0002           | <0.0002           | <0.0002           | 0.0006            | <0.0002           |                   |
| Perfluorotridecanoic acid (PFTTrDA)           | 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<br>(Matrix: SOIL)                    |                    |        |       | Sample ID | 0960_SS125_220517 | 0960_SS276_220517 | 0960_SS122_220517 | 0960_SS121_220517 | 0960_SS124_220517 |
|-----------------------------------------------------------|--------------------|--------|-------|-----------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                      |                    |        |       |           | 17-May-2022 08:32 | 17-May-2022 08:33 | 17-May-2022 08:41 | 17-May-2022 08:48 | 17-May-2022 08:49 |
| Compound                                                  | CAS Number         | LOR    | Unit  |           | EP2205953-001     | EP2205953-002     | EP2205953-003     | EP2205953-005     | EP2205953-006     |
|                                                           |                    |        |       | Result    | Result            | Result            | Result            | Result            | Result            |
| <b>EP231C: Perfluoroalkyl Sulfonamides - Continued</b>    |                    |        |       |           |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>         |                    |        |       |           |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231P: PFAS Sums</b>                                  |                    |        |       |           |                   |                   |                   |                   |                   |
| Sum of PFAS                                               | ----               | 0.0002 | mg/kg | 0.0005    | 0.0007            | 0.0048            | 0.105             | 0.0022            |                   |
| Sum of PFHxS and PFOS                                     | 355-46-4/1763-23-1 | 0.0002 | mg/kg | 0.0005    | 0.0007            | 0.0045            | 0.0896            | 0.0022            |                   |
| Sum of PFAS (WA DER List)                                 | ----               | 0.0002 | mg/kg | 0.0005    | 0.0007            | 0.0048            | 0.0896            | 0.0022            |                   |
| <b>EP231S: PFAS Surrogate</b>                             |                    |        |       |           |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                 | ----               | 0.0002 | %     | 104       | 93.0              | 104               | 112               | 102               |                   |
| 13C8-PFOA                                                 | ----               | 0.0002 | %     | 95.0      | 90.0              | 102               | 97.5              | 98.0              |                   |



## Analytical Results

Sub-Matrix: SEDIMENT  
 (Matrix: SOIL)

Sample ID

|                                                    |            |        |       | 0960_SS277_220517 | 0960_SS123_220517 | 0960_SS114_220517 | 0960_SS265_220517 | 0960_SS189_220517 |
|----------------------------------------------------|------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                               |            |        |       | 17-May-2022 08:50 | 17-May-2022 08:55 | 17-May-2022 09:09 | 17-May-2022 09:34 | 17-May-2022 10:59 |
| Compound                                           | CAS Number | LOR    | Unit  | EP2205953-007     | EP2205953-008     | EP2205953-009     | EP2205953-014     | EP2205953-022     |
|                                                    |            |        |       | Result            | Result            | Result            | Result            | Result            |
| <b>EA055: Moisture Content (Dried @ 105-110°C)</b> |            |        |       |                   |                   |                   |                   |                   |
| Moisture Content                                   | ----       | 0.1    | %     | 13.0              | 11.7              | 11.5              | 15.9              | 32.9              |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>       |            |        |       |                   |                   |                   |                   |                   |
| 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           | 0.0004            | <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 | 0.0076            | 0.0294            | 0.0062            | 0.0003            | 0.0021            |
| Perfluorodecane sulfonic acid (PFDS)               | 335-77-3   | 0.0002 | mg/kg | 0.0004            | 0.0059            | 0.0023            | <0.0002           | <0.0002           |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>     |            |        |       |                   |                   |                   |                   |                   |
| 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           | 0.0003            | <0.0002           | <0.0002           | <0.0002           |
| Perfluorotridecanoic acid (PFTTrDA)                | 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           |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>         |            |        |       |                   |                   |                   |                   |                   |
| 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<br>(Matrix: SOIL)                    |                    |        |       | Sample ID | 0960_SS277_220517 | 0960_SS123_220517 | 0960_SS114_220517 | 0960_SS265_220517 | 0960_SS189_220517 |
|-----------------------------------------------------------|--------------------|--------|-------|-----------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                      |                    |        |       |           | 17-May-2022 08:50 | 17-May-2022 08:55 | 17-May-2022 09:09 | 17-May-2022 09:34 | 17-May-2022 10:59 |
| Compound                                                  | CAS Number         | LOR    | Unit  |           | EP2205953-007     | EP2205953-008     | EP2205953-009     | EP2205953-014     | EP2205953-022     |
|                                                           |                    |        |       | Result    | Result            | Result            | Result            | Result            | Result            |
| <b>EP231C: Perfluoroalkyl Sulfonamides - Continued</b>    |                    |        |       |           |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>         |                    |        |       |           |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231P: PFAS Sums</b>                                  |                    |        |       |           |                   |                   |                   |                   |                   |
| Sum of PFAS                                               | ----               | 0.0002 | mg/kg | 0.0080    | 0.0363            | 0.0085            | 0.0007            | 0.0021            |                   |
| Sum of PFHxS and PFOS                                     | 355-46-4/1763-23-1 | 0.0002 | mg/kg | 0.0076    | 0.0299            | 0.0062            | 0.0007            | 0.0021            |                   |
| Sum of PFAS (WA DER List)                                 | ----               | 0.0002 | mg/kg | 0.0076    | 0.0299            | 0.0062            | 0.0007            | 0.0021            |                   |
| <b>EP231S: PFAS Surrogate</b>                             |                    |        |       |           |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                 | ----               | 0.0002 | %     | 97.5      | 98.0              | 87.5              | 106               | 91.0              |                   |
| 13C8-PFOA                                                 | ----               | 0.0002 | %     | 96.5      | 89.5              | 92.5              | 97.5              | 93.0              |                   |





## Analytical Results

Sub-Matrix: SEDIMENT  
 (Matrix: SOIL)

Sample ID

|                                                    |            |        |       | 0960_SS190_220517 | 0960_SS291_220517 | 0960_SS157_220517 | 0960_SD205_220517 | 0960_SD208_220517 |
|----------------------------------------------------|------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                               |            |        |       | 17-May-2022 11:07 | 17-May-2022 11:23 | 17-May-2022 12:07 | 17-May-2022 16:16 | 17-May-2022 16:20 |
| Compound                                           | CAS Number | LOR    | Unit  | EP2205953-023     | EP2205953-024     | EP2205953-028     | EP2205953-029     | EP2205953-032     |
|                                                    |            |        |       | Result            | Result            | Result            | Result            | Result            |
| <b>EA055: Moisture Content (Dried @ 105-110°C)</b> |            |        |       |                   |                   |                   |                   |                   |
| Moisture Content                                   | ----       | 0.1    | %     | 37.6              | 18.3              | 23.9              | 22.8              | 17.4              |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>       |            |        |       |                   |                   |                   |                   |                   |
| 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 | 0.0026            | 0.0022            | 0.0022            | <0.0002           | <0.0002           |
| Perfluorodecane sulfonic acid (PFDS)               | 335-77-3   | 0.0002 | mg/kg | 0.0007            | <0.0002           | <0.0002           | <0.0002           | <0.0002           |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>     |            |        |       |                   |                   |                   |                   |                   |
| 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 (PFTTrDA)                | 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           |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>         |            |        |       |                   |                   |                   |                   |                   |
| 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

|                                                           |                    |        |       | 0960_SS190_220517 | 0960_SS291_220517 | 0960_SS157_220517 | 0960_SD205_220517 | 0960_SD208_220517 |
|-----------------------------------------------------------|--------------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                      |                    |        |       | 17-May-2022 11:07 | 17-May-2022 11:23 | 17-May-2022 12:07 | 17-May-2022 16:16 | 17-May-2022 16:20 |
| Compound                                                  | CAS Number         | LOR    | Unit  | EP2205953-023     | EP2205953-024     | EP2205953-028     | EP2205953-029     | EP2205953-032     |
|                                                           |                    |        |       | Result            | Result            | Result            | Result            | Result            |
| <b>EP231C: Perfluoroalkyl Sulfonamides - Continued</b>    |                    |        |       |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>         |                    |        |       |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231P: PFAS Sums</b>                                  |                    |        |       |                   |                   |                   |                   |                   |
| Sum of PFAS                                               | ----               | 0.0002 | mg/kg | 0.0033            | 0.0022            | 0.0022            | <0.0002           | <0.0002           |
| Sum of PFHxS and PFOS                                     | 355-46-4/1763-23-1 | 0.0002 | mg/kg | 0.0026            | 0.0022            | 0.0022            | <0.0002           | <0.0002           |
| Sum of PFAS (WA DER List)                                 | ----               | 0.0002 | mg/kg | 0.0026            | 0.0022            | 0.0022            | <0.0002           | <0.0002           |
| <b>EP231S: PFAS Surrogate</b>                             |                    |        |       |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                 | ----               | 0.0002 | %     | 107               | 91.0              | 104               | 99.5              | 93.0              |
| 13C8-PFOA                                                 | ----               | 0.0002 | %     | 97.5              | 92.0              | 103               | 96.5              | 95.0              |



## Analytical Results

Sub-Matrix: SOIL  
 (Matrix: SOIL)

Sample ID

|                                                    |            |        |       | 0960_QC105_220517 | 0960_SS113_220517 | 0960_SS235_220517 | 0960_SS234_220517 | 0960_SS231_220517 |
|----------------------------------------------------|------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                               |            |        |       | 17-May-2022 08:43 | 17-May-2022 09:09 | 17-May-2022 09:18 | 17-May-2022 09:19 | 17-May-2022 09:25 |
| Compound                                           | CAS Number | LOR    | Unit  | EP2205953-004     | EP2205953-010     | EP2205953-011     | EP2205953-012     | EP2205953-013     |
|                                                    |            |        |       | Result            | Result            | Result            | Result            | Result            |
| <b>EA055: Moisture Content (Dried @ 105-110°C)</b> |            |        |       |                   |                   |                   |                   |                   |
| Moisture Content                                   | ----       | 0.1    | %     | 4.9               | 6.9               | 6.7               | 15.9              | 10.1              |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>       |            |        |       |                   |                   |                   |                   |                   |
| 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           | <0.0002           | <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 | 0.0042            | 0.100             | 0.0042            | 0.0436            | 0.0135            |
| Perfluorodecane sulfonic acid (PFDS)               | 335-77-3   | 0.0002 | mg/kg | <0.0002           | 0.0003            | <0.0002           | 0.0029            | <0.0002           |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>     |            |        |       |                   |                   |                   |                   |                   |
| 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 | 0.0004            | <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           | 0.0003            | <0.0002           |
| Perfluorononanoic acid (PFNA)                      | 375-95-1   | 0.0002 | mg/kg | <0.0002           | <0.0002           | <0.0002           | 0.0010            | <0.0002           |
| Perfluorodecanoic acid (PFDA)                      | 335-76-2   | 0.0002 | mg/kg | <0.0002           | <0.0002           | <0.0002           | 0.0019            | <0.0002           |
| Perfluoroundecanoic acid (PFUnDA)                  | 2058-94-8  | 0.0002 | mg/kg | <0.0002           | <0.0002           | <0.0002           | 0.0006            | <0.0002           |
| Perfluorododecanoic acid (PFDoDA)                  | 307-55-1   | 0.0002 | mg/kg | <0.0002           | <0.0002           | <0.0002           | 0.0006            | <0.0002           |
| Perfluorotridecanoic acid (PFTriDA)                | 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           |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>         |            |        |       |                   |                   |                   |                   |                   |
| 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

|                                                           |                    |        |       | 0960_QC105_220517 | 0960_SS113_220517 | 0960_SS235_220517 | 0960_SS234_220517 | 0960_SS231_220517 |
|-----------------------------------------------------------|--------------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                      |                    |        |       | 17-May-2022 08:43 | 17-May-2022 09:09 | 17-May-2022 09:18 | 17-May-2022 09:19 | 17-May-2022 09:25 |
| Compound                                                  | CAS Number         | LOR    | Unit  | EP2205953-004     | EP2205953-010     | EP2205953-011     | EP2205953-012     | EP2205953-013     |
|                                                           |                    |        |       | Result            | Result            | Result            | Result            | Result            |
| <b>EP231C: Perfluoroalkyl Sulfonamides - Continued</b>    |                    |        |       |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>         |                    |        |       |                   |                   |                   |                   |                   |
| 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           | 0.0009            | <0.0005           |
| 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | 120226-60-0        | 0.0005 | mg/kg | <0.0005           | <0.0005           | <0.0005           | 0.0009            | <0.0005           |
| <b>EP231P: PFAS Sums</b>                                  |                    |        |       |                   |                   |                   |                   |                   |
| Sum of PFAS                                               | ----               | 0.0002 | mg/kg | 0.0054            | 0.100             | 0.0042            | 0.0527            | 0.0135            |
| Sum of PFHxS and PFOS                                     | 355-46-4/1763-23-1 | 0.0002 | mg/kg | 0.0050            | 0.100             | 0.0042            | 0.0436            | 0.0135            |
| Sum of PFAS (WA DER List)                                 | ----               | 0.0002 | mg/kg | 0.0054            | 0.100             | 0.0042            | 0.0448            | 0.0135            |
| <b>EP231S: PFAS Surrogate</b>                             |                    |        |       |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                 | ----               | 0.0002 | %     | 99.0              | 94.5              | 94.5              | 99.0              | 91.0              |
| 13C8-PFOA                                                 | ----               | 0.0002 | %     | 96.0              | 97.0              | 95.0              | 99.5              | 97.0              |



## Analytical Results

| Sub-Matrix: SOIL<br>(Matrix: SOIL)                 |            |        |       | Sample ID | 0960_QC106_220517 | 0960_SS170_220517 | 0960_SS108_220517 | 0960_SS200_220517 | 0960_QC107_220517 |
|----------------------------------------------------|------------|--------|-------|-----------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                               |            |        |       |           | 17-May-2022 09:35 | 17-May-2022 09:48 | 17-May-2022 09:50 | 17-May-2022 10:41 | 17-May-2022 10:42 |
| Compound                                           | CAS Number | LOR    | Unit  |           | EP2205953-015     | EP2205953-016     | EP2205953-017     | EP2205953-018     | EP2205953-019     |
|                                                    |            |        |       | Result    | Result            | Result            | Result            | Result            | Result            |
| <b>EA055: Moisture Content (Dried @ 105-110°C)</b> |            |        |       |           |                   |                   |                   |                   |                   |
| Moisture Content                                   | ----       | 0.1    | %     |           | 22.6              | 21.8              | 31.5              | 7.6               | 6.1               |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>       |            |        |       |           |                   |                   |                   |                   |                   |
| 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 |           | 0.0004            | <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 |           | 0.0008            | 0.0033            | 0.0066            | <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           |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>     |            |        |       |           |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>         |            |        |       |           |                   |                   |                   |                   |                   |
| 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

|                                                           |                    |        |       | 0960_QC106_220517 | 0960_SS170_220517 | 0960_SS108_220517 | 0960_SS200_220517 | 0960_QC107_220517 |
|-----------------------------------------------------------|--------------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                      |                    |        |       | 17-May-2022 09:35 | 17-May-2022 09:48 | 17-May-2022 09:50 | 17-May-2022 10:41 | 17-May-2022 10:42 |
| Compound                                                  | CAS Number         | LOR    | Unit  | EP2205953-015     | EP2205953-016     | EP2205953-017     | EP2205953-018     | EP2205953-019     |
|                                                           |                    |        |       | Result            | Result            | Result            | Result            | Result            |
| <b>EP231C: Perfluoroalkyl Sulfonamides - Continued</b>    |                    |        |       |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>         |                    |        |       |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231P: PFAS Sums</b>                                  |                    |        |       |                   |                   |                   |                   |                   |
| Sum of PFAS                                               | ----               | 0.0002 | mg/kg | 0.0012            | 0.0033            | 0.0066            | <0.0002           | <0.0002           |
| Sum of PFHxS and PFOS                                     | 355-46-4/1763-23-1 | 0.0002 | mg/kg | 0.0012            | 0.0033            | 0.0066            | <0.0002           | <0.0002           |
| Sum of PFAS (WA DER List)                                 | ----               | 0.0002 | mg/kg | 0.0012            | 0.0033            | 0.0066            | <0.0002           | <0.0002           |
| <b>EP231S: PFAS Surrogate</b>                             |                    |        |       |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                 | ----               | 0.0002 | %     | 103               | 91.0              | 94.0              | 94.5              | 102               |
| 13C8-PFOA                                                 | ----               | 0.0002 | %     | 93.0              | 90.0              | 91.5              | 92.5              | 97.5              |





## Analytical Results

Sub-Matrix: SOIL  
 (Matrix: SOIL)

Sample ID

|                                                    |            |        |       | 0960_SD199_220517 | 0960_SS227_220517 | 0960_SS174_220517 | 0960_SS243_220517 | 0960_SD219_220517 |
|----------------------------------------------------|------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                               |            |        |       | 17-May-2022 10:47 | 17-May-2022 10:48 | 17-May-2022 12:00 | 17-May-2022 12:04 | 17-May-2022 12:06 |
| Compound                                           | CAS Number | LOR    | Unit  | EP2205953-020     | EP2205953-021     | EP2205953-025     | EP2205953-026     | EP2205953-027     |
|                                                    |            |        |       | Result            | Result            | Result            | Result            | Result            |
| <b>EA055: Moisture Content (Dried @ 105-110°C)</b> |            |        |       |                   |                   |                   |                   |                   |
| Moisture Content                                   | ----       | 0.1    | %     | 2.8               | 8.8               | 6.6               | 15.3              | 19.1              |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>       |            |        |       |                   |                   |                   |                   |                   |
| 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           | 0.0057            | 0.0285            | 0.0469            | 0.0098            |
| Perfluorodecane sulfonic acid (PFDS)               | 335-77-3   | 0.0002 | mg/kg | <0.0002           | <0.0002           | 0.0005            | 0.0012            | <0.0002           |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>     |            |        |       |                   |                   |                   |                   |                   |
| 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 (PFTTrDA)                | 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           |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>         |            |        |       |                   |                   |                   |                   |                   |
| 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

|                                                           |                    |        |       | 0960_SD199_220517 | 0960_SS227_220517 | 0960_SS174_220517 | 0960_SS243_220517 | 0960_SD219_220517 |
|-----------------------------------------------------------|--------------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                      |                    |        |       | 17-May-2022 10:47 | 17-May-2022 10:48 | 17-May-2022 12:00 | 17-May-2022 12:04 | 17-May-2022 12:06 |
| Compound                                                  | CAS Number         | LOR    | Unit  | EP2205953-020     | EP2205953-021     | EP2205953-025     | EP2205953-026     | EP2205953-027     |
|                                                           |                    |        |       | Result            | Result            | Result            | Result            | Result            |
| <b>EP231C: Perfluoroalkyl Sulfonamides - Continued</b>    |                    |        |       |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>         |                    |        |       |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231P: PFAS Sums</b>                                  |                    |        |       |                   |                   |                   |                   |                   |
| Sum of PFAS                                               | ----               | 0.0002 | mg/kg | <0.0002           | 0.0057            | 0.0290            | 0.0481            | 0.0098            |
| Sum of PFHxS and PFOS                                     | 355-46-4/1763-23-1 | 0.0002 | mg/kg | <0.0002           | 0.0057            | 0.0285            | 0.0469            | 0.0098            |
| Sum of PFAS (WA DER List)                                 | ----               | 0.0002 | mg/kg | <0.0002           | 0.0057            | 0.0285            | 0.0469            | 0.0098            |
| <b>EP231S: PFAS Surrogate</b>                             |                    |        |       |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                 | ----               | 0.0002 | %     | 93.0              | 96.5              | 98.0              | 102               | 98.0              |
| 13C8-PFOA                                                 | ----               | 0.0002 | %     | 97.5              | 97.0              | 94.5              | 96.0              | 97.5              |



## Analytical Results

Sub-Matrix: SOIL  
 (Matrix: SOIL)

Sample ID

|                                                    |            |        |       | 0960_SS301_220517 | 0960_SS279_220517 | 0960_SS168_220517 | 0960_SS298_220517 | 0960_SS166_220517 |
|----------------------------------------------------|------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                               |            |        |       | 17-May-2022 16:18 | 17-May-2022 16:19 | 17-May-2022 16:21 | 17-May-2022 16:22 | 17-May-2022 16:23 |
| Compound                                           | CAS Number | LOR    | Unit  | EP2205953-030     | EP2205953-031     | EP2205953-033     | EP2205953-034     | EP2205953-036     |
|                                                    |            |        |       | Result            | Result            | Result            | Result            | Result            |
| <b>EA055: Moisture Content (Dried @ 105-110°C)</b> |            |        |       |                   |                   |                   |                   |                   |
| Moisture Content                                   | ----       | 0.1    | %     | 18.4              | 8.4               | 16.6              | 14.7              | 8.4               |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>       |            |        |       |                   |                   |                   |                   |                   |
| 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           | 0.0007            | 0.0014            | <0.0002           | 0.0019            |
| Perfluorodecane sulfonic acid (PFDS)               | 335-77-3   | 0.0002 | mg/kg | <0.0002           | <0.0002           | <0.0002           | <0.0002           | <0.0002           |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>     |            |        |       |                   |                   |                   |                   |                   |
| 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 (PFTTrDA)                | 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           |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>         |            |        |       |                   |                   |                   |                   |                   |
| 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<br>(Matrix: SOIL)                        |                    |        |       | Sample ID | 0960_SS301_220517 | 0960_SS279_220517 | 0960_SS168_220517 | 0960_SS298_220517 | 0960_SS166_220517 |
|-----------------------------------------------------------|--------------------|--------|-------|-----------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                      |                    |        |       |           | 17-May-2022 16:18 | 17-May-2022 16:19 | 17-May-2022 16:21 | 17-May-2022 16:22 | 17-May-2022 16:23 |
| Compound                                                  | CAS Number         | LOR    | Unit  |           | EP2205953-030     | EP2205953-031     | EP2205953-033     | EP2205953-034     | EP2205953-036     |
|                                                           |                    |        |       | Result    | Result            | Result            | Result            | Result            | Result            |
| <b>EP231C: Perfluoroalkyl Sulfonamides - Continued</b>    |                    |        |       |           |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>         |                    |        |       |           |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231P: PFAS Sums</b>                                  |                    |        |       |           |                   |                   |                   |                   |                   |
| Sum of PFAS                                               | ----               | 0.0002 | mg/kg | <0.0002   | 0.0007            | 0.0014            | <0.0002           | 0.0019            | 0.0019            |
| Sum of PFHxS and PFOS                                     | 355-46-4/1763-23-1 | 0.0002 | mg/kg | <0.0002   | 0.0007            | 0.0014            | <0.0002           | 0.0019            | 0.0019            |
| Sum of PFAS (WA DER List)                                 | ----               | 0.0002 | mg/kg | <0.0002   | 0.0007            | 0.0014            | <0.0002           | 0.0019            | 0.0019            |
| <b>EP231S: PFAS Surrogate</b>                             |                    |        |       |           |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                 | ----               | 0.0002 | %     | 95.5      | 102               | 106               | 96.0              | 93.5              | 93.5              |
| 13C8-PFOA                                                 | ----               | 0.0002 | %     | 95.5      | 98.0              | 93.5              | 95.5              | 98.5              | 98.5              |



## Surrogate Control Limits

| Sub-Matrix: <b>SEDIMENT</b>   |            | Recovery Limits (%) |      |
|-------------------------------|------------|---------------------|------|
| Compound                      | CAS Number | Low                 | High |
| <b>EP231S: PFAS Surrogate</b> |            |                     |      |
| <b>13C4-PFOS</b>              | ----       | 60                  | 120  |
| <b>13C8-PFOA</b>              | ----       | 60                  | 120  |

| Sub-Matrix: <b>SOIL</b>       |            | Recovery Limits (%) |      |
|-------------------------------|------------|---------------------|------|
| Compound                      | CAS Number | Low                 | High |
| <b>EP231S: PFAS Surrogate</b> |            |                     |      |
| <b>13C4-PFOS</b>              | ----       | 60                  | 120  |
| <b>13C8-PFOA</b>              | ----       | 60                  | 120  |

## Inter-Laboratory Testing

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

(SOIL) EP231A: Perfluoroalkyl Sulfonic Acids

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

(SOIL) EP231C: Perfluoroalkyl Sulfonamides

(SOIL) EP231B: Perfluoroalkyl Carboxylic Acids

(SOIL) EP231P: PFAS Sums

(SOIL) EP231S: PFAS Surrogate

(SOIL) EA055: Moisture Content (Dried @ 105-110°C)

## QUALITY CONTROL REPORT

|                                |                                                   |                                |                                                          |
|--------------------------------|---------------------------------------------------|--------------------------------|----------------------------------------------------------|
| <b>Work Order</b>              | <b>: EP2205953</b>                                | <b>Page</b>                    | : 1 of 11                                                |
| <b>Client</b>                  | <b>: STANTEC AUSTRALIA PTY LTD</b>                | <b>Laboratory</b>              | : Environmental Division Perth                           |
| <b>Contact</b>                 | : [REDACTED]                                      | <b>Contact</b>                 | : Customer Services EP                                   |
| <b>Address</b>                 | : GROUND FLOOR 226 ADELAIDE TERRACE<br>PERTH 6000 | <b>Address</b>                 | : 26 Rigali Way Wangara Western Australia Australia 6065 |
| <b>Telephone</b>               | : ----                                            | <b>Telephone</b>               | : +61-8-9406 1301                                        |
| <b>Project</b>                 | : WA_0960_PFASOMP                                 | <b>Date Samples Received</b>   | : 20-May-2022                                            |
| <b>Order number</b>            | : DEF19009/0960                                   | <b>Date Analysis Commenced</b> | : 29-May-2022                                            |
| <b>C-O-C number</b>            | : 37676                                           | <b>Issue Date</b>              | : 01-Jun-2022                                            |
| <b>Sampler</b>                 | : [REDACTED]                                      |                                |                                                          |
| <b>Site</b>                    | : DEF19009/Learmonth                              |                                |                                                          |
| <b>Quote number</b>            | : SY/139/19 B                                     |                                |                                                          |
| <b>No. of samples received</b> | : 36                                              |                                |                                                          |
| <b>No. of samples analysed</b> | : 35                                              |                                |                                                          |



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]  | LCMS Coordinator | Sydney Inorganics, Smithfield, NSW |
| [REDACTED]  | LCMS Coordinator | Sydney Organics, Smithfield, NSW   |





## 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**

| 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: 4367006) |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EB2214453-003                                                 | Anonymous         | EA055: Moisture Content                        | ----       | 0.1                               | %     | 25.0            | 23.6             | 6.0     | 0% - 20%           |
| EB2214453-014                                                 | Anonymous         | EA055: Moisture Content                        | ----       | 0.1                               | %     | 18.4            | 16.4             | 11.5    | 0% - 20%           |
| EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4367007) |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2205953-004                                                 | 0960_QC105_220517 | EA055: Moisture Content                        | ----       | 0.1                               | %     | 4.9             | 5.3              | 7.7     | 0% - 20%           |
| EP2205953-015                                                 | 0960_QC106_220517 | EA055: Moisture Content                        | ----       | 0.1                               | %     | 22.6            | 22.7             | 0.0     | 0% - 20%           |
| EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4367008) |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2205953-024                                                 | 0960_SS291_220517 | EA055: Moisture Content                        | ----       | 0.1                               | %     | 18.3            | 19.2             | 4.6     | 0% - 20%           |
| EP2205953-036                                                 | 0960_SS166_220517 | EA055: Moisture Content                        | ----       | 0.1                               | %     | 8.4             | 8.3              | 0.0     | 0% - 20%           |
| EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4370431)       |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2205953-001                                                 | 0960_SS125_220517 | EP231X: Perfluorobutane sulfonic acid (PFBS)   | 375-73-5   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                               |                   | EP231X: Perfluoropentane sulfonic acid (PFPeS) | 2706-91-4  | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                               |                   | EP231X: Perfluorohexane sulfonic acid (PFHxS)  | 355-46-4   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                               |                   | EP231X: Perfluoroheptane sulfonic acid (PFHpS) | 375-92-8   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                               |                   | EP231X: Perfluorooctane sulfonic acid (PFOS)   | 1763-23-1  | 0.0002                            | mg/kg | 0.0005          | 0.0005           | 0.0     | No Limit           |
|                                                               |                   | EP231X: Perfluorodecane sulfonic acid (PFDS)   | 335-77-3   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
| EP2205953-011                                                 | 0960_SS235_220517 | 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 | 0.0042          | 0.0042           | 0.0     | 0% - 20%           |
|                                                               |                   | 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: 4370443)       |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EB2213834-009                                                 | Anonymous         | EP231X: Perfluorobutane sulfonic acid (PFBS)   | 375-73-5   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |



| Sub-Matrix: SOIL                                                    |                   |                                                |            | Laboratory Duplicate (DUP) Report |         |                 |                  |         |                    |
|---------------------------------------------------------------------|-------------------|------------------------------------------------|------------|-----------------------------------|---------|-----------------|------------------|---------|--------------------|
| Laboratory sample ID                                                | Sample ID         | Method: Compound                               | CAS Number | LOR                               | Unit    | Original Result | Duplicate Result | RPD (%) | Acceptable RPD (%) |
| EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4370443) - continued |                   |                                                |            |                                   |         |                 |                  |         |                    |
| EB2213834-009                                                       | Anonymous         | EP231X: Perfluoropentane sulfonic acid (PFPeS) | 2706-91-4  | 0.0002                            | mg/kg   | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                     |                   | EP231X: Perfluorohexane sulfonic acid (PFHxS)  | 355-46-4   | 0.0002                            | mg/kg   | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                     |                   | EP231X: Perfluoroheptane sulfonic acid (PFHpS) | 375-92-8   | 0.0002                            | mg/kg   | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                     |                   | EP231X: Perfluorooctane sulfonic acid (PFOS)   | 1763-23-1  | 0.0002                            | mg/kg   | 0.0020          | 0.0018           | 9.2     | 0% - 50%           |
|                                                                     |                   | EP231X: Perfluorodecane sulfonic acid (PFDS)   | 335-77-3   | 0.0002                            | mg/kg   | <0.0002         | <0.0002          | 0.0     | No Limit           |
| EP2205953-031                                                       | 0960_SS279_220517 | 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          | 0.0007           | 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: 4370431)           |                   |                                                |            |                                   |         |                 |                  |         |                    |
| EP2205953-001                                                       | 0960_SS125_220517 | 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 (PFTriDA)    | 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           |
| EP2205953-011                                                       | 0960_SS235_220517 | 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 (PFTriDA)    | 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: 4370443)           |                   |                                                |            |                                   |         |                 |                  |         |                    |
| EB2213834-009                                                       | Anonymous         | EP231X: Perfluoropentanoic acid (PFPeA)        | 2706-90-3  | 0.0002                            | mg/kg   | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                     |                   | EP231X: Perfluorohexanoic acid (PFHxA)         | 307-24-4   | 0.0002                            | mg/kg   | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                     |                   | EP231X: Perfluoroheptanoic acid (PFHpA)        | 375-85-9   | 0.0002                            | mg/kg   | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                     |                   | EP231X: Perfluorooctanoic acid (PFOA)          | 335-67-1   | 0.0002                            | mg/kg   | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                     |                   | EP231X: Perfluorononanoic acid (PFNA)          | 375-95-1   | 0.0002                            | mg/kg   | <0.0002         | <0.0002          | 0.0     | No Limit           |



| 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: 4370443) - continued |                   |                                                                   |            |                                   |       |                 |                  |         |                    |
| EB2213834-009                                                         | Anonymous         | 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           |
| EP2205953-031                                                         | 0960_SS279_220517 | 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: 4370431)             |            |                                   |       |                 |                  |         |                    |
| EP2205953-001                                                         | 0960_SS125_220517 | 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           |
| EP2205953-011                                                         | 0960_SS235_220517 | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                       |                   | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9  | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                       |                   | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6  | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                       |                   | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8 | 0.0005                            | mg/kg | <0.0005         | <0.0005          | 0.0     | No Limit           |
|                                                                       |                   | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2  | 0.0005                            | mg/kg | <0.0005         | <0.0005          | 0.0     | No Limit           |



| Sub-Matrix: SOIL                                                  |                   |                                                                   |             | Laboratory Duplicate (DUP) Report |       |                 |                  |         |                    |
|-------------------------------------------------------------------|-------------------|-------------------------------------------------------------------|-------------|-----------------------------------|-------|-----------------|------------------|---------|--------------------|
| Laboratory sample ID                                              | Sample ID         | Method: Compound                                                  | CAS Number  | LOR                               | Unit  | Original Result | Duplicate Result | RPD (%) | Acceptable RPD (%) |
| EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4370431) - continued |                   |                                                                   |             |                                   |       |                 |                  |         |                    |
| EP2205953-011                                                     | 0960_SS235_220517 | 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: 4370443)             |                   |                                                                   |             |                                   |       |                 |                  |         |                    |
| EB2213834-009                                                     | Anonymous         | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                   |                   | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                   |                   | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                   |                   | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.0005                            | mg/kg | <0.0005         | <0.0005          | 0.0     | No Limit           |
|                                                                   |                   | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.0005                            | mg/kg | <0.0005         | <0.0005          | 0.0     | No Limit           |
|                                                                   |                   | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.0005                            | mg/kg | <0.0005         | <0.0005          | 0.0     | No Limit           |
|                                                                   |                   | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.0005                            | mg/kg | <0.0005         | <0.0005          | 0.0     | No Limit           |
| EP2205953-031                                                     | 0960_SS279_220517 | 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: 4370431)      |                   |                                                                   |             |                                   |       |                 |                  |         |                    |
| EP2205953-001                                                     | 0960_SS125_220517 | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.0005                            | mg/kg | <0.0005         | <0.0005          | 0.0     | No Limit           |
|                                                                   |                   | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 27619-97-2  | 0.0005                            | mg/kg | <0.0005         | <0.0005          | 0.0     | No Limit           |
|                                                                   |                   | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | 39108-34-4  | 0.0005                            | mg/kg | <0.0005         | <0.0005          | 0.0     | No Limit           |
|                                                                   |                   | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | 120226-60-0 | 0.0005                            | mg/kg | <0.0005         | <0.0005          | 0.0     | No Limit           |



| Sub-Matrix: SOIL                                                         |                   |                                                     |             | Laboratory Duplicate (DUP) Report |       |                 |                  |         |                    |
|--------------------------------------------------------------------------|-------------------|-----------------------------------------------------|-------------|-----------------------------------|-------|-----------------|------------------|---------|--------------------|
| Laboratory sample ID                                                     | Sample ID         | Method: Compound                                    | CAS Number  | LOR                               | Unit  | Original Result | Duplicate Result | RPD (%) | Acceptable RPD (%) |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4370431) - continued |                   |                                                     |             |                                   |       |                 |                  |         |                    |
| EP2205953-011                                                            | 0960_SS235_220517 | 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: 4370443)             |                   |                                                     |             |                                   |       |                 |                  |         |                    |
| EB2213834-009                                                            | Anonymous         | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)   | 757124-72-4 | 0.0005                            | mg/kg | <0.0005         | <0.0005          | 0.0     | No Limit           |
|                                                                          |                   | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)   | 27619-97-2  | 0.0005                            | mg/kg | <0.0005         | <0.0005          | 0.0     | No Limit           |
|                                                                          |                   | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)   | 39108-34-4  | 0.0005                            | mg/kg | <0.0005         | <0.0005          | 0.0     | No Limit           |
|                                                                          |                   | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS) | 120226-60-0 | 0.0005                            | mg/kg | <0.0005         | <0.0005          | 0.0     | No Limit           |
| EP2205953-031                                                            | 0960_SS279_220517 | 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           |



## 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**

| Sub-Matrix: SOIL                                         |            |        |       | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |     |
|----------------------------------------------------------|------------|--------|-------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|-----|
|                                                          |            |        |       |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |     |
| Method: Compound                                         | CAS Number | LOR    | Unit  | Result                      |                                       |                           |                                   |     |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4370431)   |            |        |       |                             |                                       |                           |                                   |     |
| EP231X: Perfluorobutane sulfonic acid (PFBS)             | 375-73-5   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 127                       | 72.0                              | 128 |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)           | 2706-91-4  | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 122                       | 73.0                              | 123 |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)            | 355-46-4   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 98.4                      | 67.0                              | 130 |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)           | 375-92-8   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 113                       | 70.0                              | 132 |
| EP231X: Perfluorooctane sulfonic acid (PFOS)             | 1763-23-1  | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 108                       | 68.0                              | 136 |
| EP231X: Perfluorodecane sulfonic acid (PFDS)             | 335-77-3   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 121                       | 59.0                              | 134 |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4370443)   |            |        |       |                             |                                       |                           |                                   |     |
| EP231X: Perfluorobutane sulfonic acid (PFBS)             | 375-73-5   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 113                       | 72.0                              | 128 |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)           | 2706-91-4  | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 117                       | 73.0                              | 123 |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)            | 355-46-4   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 97.6                      | 67.0                              | 130 |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)           | 375-92-8   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 108                       | 70.0                              | 132 |
| EP231X: Perfluorooctane sulfonic acid (PFOS)             | 1763-23-1  | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 100                       | 68.0                              | 136 |
| EP231X: Perfluorodecane sulfonic acid (PFDS)             | 335-77-3   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 101                       | 59.0                              | 134 |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4370431) |            |        |       |                             |                                       |                           |                                   |     |
| 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                         | 84.0                      | 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                         | 114                       | 71.0                              | 131 |
| EP231X: Perfluorooctanoic acid (PFOA)                    | 335-67-1   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 122                       | 69.0                              | 133 |
| EP231X: Perfluorononanoic acid (PFNA)                    | 375-95-1   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 127                       | 72.0                              | 129 |
| EP231X: Perfluorodecanoic acid (PFDA)                    | 335-76-2   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 126                       | 69.0                              | 133 |
| EP231X: Perfluoroundecanoic acid (PFUnDA)                | 2058-94-8  | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 120                       | 64.0                              | 136 |
| EP231X: Perfluorododecanoic acid (PFDoDA)                | 307-55-1   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 123                       | 69.0                              | 135 |
| EP231X: Perfluorotridecanoic acid (PFTrDA)               | 72629-94-8 | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 108                       | 66.0                              | 139 |
| EP231X: Perfluorotetradecanoic acid (PFTeDA)             | 376-06-7   | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 98.9                      | 69.0                              | 133 |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4370443) |            |        |       |                             |                                       |                           |                                   |     |
| EP231X: Perfluorobutanoic acid (PFBA)                    | 375-22-4   | 0.001  | mg/kg | <0.001                      | 0.00625 mg/kg                         | 97.9                      | 71.0                              | 135 |
| EP231X: Perfluoropentanoic acid (PFPeA)                  | 2706-90-3  | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 81.2                      | 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                         | 124                       | 71.0                              | 131 |
| EP231X: Perfluorooctanoic acid (PFOA)                    | 335-67-1   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 114                       | 69.0                              | 133 |
| EP231X: Perfluorononanoic acid (PFNA)                    | 375-95-1   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 113                       | 72.0                              | 129 |
| EP231X: Perfluorodecanoic acid (PFDA)                    | 335-76-2   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 114                       | 69.0                              | 133 |
| EP231X: Perfluoroundecanoic acid (PFUnDA)                | 2058-94-8  | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 118                       | 64.0                              | 136 |





Sub-Matrix: **SOIL**

| Sub-Matrix: SOIL                                                     |             |        |       | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |     |
|----------------------------------------------------------------------|-------------|--------|-------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|-----|
|                                                                      |             |        |       |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |     |
| Method: Compound                                                     | CAS Number  | LOR    | Unit  | Result                      |                                       |                           |                                   |     |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4370443) - continued |             |        |       |                             |                                       |                           |                                   |     |
| 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                         | 94.8                      | 66.0                              | 139 |
| EP231X: Perfluorotetradecanoic acid (PFTeDA)                         | 376-06-7    | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 86.8                      | 69.0                              | 133 |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4370431)                 |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: Perfluorooctane sulfonamide (FOSA)                           | 754-91-6    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 121                       | 67.0                              | 137 |
| EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)                | 31506-32-8  | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 107                       | 71.6                              | 129 |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)                 | 4151-50-2   | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 126                       | 69.8                              | 131 |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)         | 24448-09-7  | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 115                       | 68.7                              | 130 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)          | 1691-99-2   | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 104                       | 65.1                              | 134 |
| EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)    | 2355-31-9   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 117                       | 63.0                              | 144 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)     | 2991-50-6   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 128                       | 61.0                              | 139 |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4370443)                 |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: Perfluorooctane sulfonamide (FOSA)                           | 754-91-6    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 110                       | 67.0                              | 137 |
| EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)                | 31506-32-8  | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 102                       | 71.6                              | 129 |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)                 | 4151-50-2   | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 114                       | 69.8                              | 131 |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)         | 24448-09-7  | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 111                       | 68.7                              | 130 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)          | 1691-99-2   | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 97.8                      | 65.1                              | 134 |
| EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)    | 2355-31-9   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 124                       | 63.0                              | 144 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)     | 2991-50-6   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 118                       | 61.0                              | 139 |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4370431)          |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                    | 757124-72-4 | 0.0005 | mg/kg | <0.0005                     | 0.00125 mg/kg                         | 108                       | 62.0                              | 145 |
| EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                    | 27619-97-2  | 0.0005 | mg/kg | <0.0005                     | 0.00125 mg/kg                         | 120                       | 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                         | 118                       | 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                         | 120                       | 69.2                              | 143 |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4370443)          |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                    | 757124-72-4 | 0.0005 | mg/kg | <0.0005                     | 0.00125 mg/kg                         | 94.0                      | 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                         | 121                       | 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                         | 114                       | 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                         | 113                       | 69.2                              | 143 |



## 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**

| 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: 4370431)   |                   |                                                |            |                          |                  |                       |      |
| EP2205953-001                                            | 0960_SS125_220517 | EP231X: Perfluorobutane sulfonic acid (PFBS)   | 375-73-5   | 0.00125 mg/kg            | 128              | 72.0                  | 128  |
|                                                          |                   | EP231X: Perfluoropentane sulfonic acid (PFPeS) | 2706-91-4  | 0.00125 mg/kg            | 121              | 73.0                  | 123  |
|                                                          |                   | EP231X: Perfluorohexane sulfonic acid (PFHxS)  | 355-46-4   | 0.00125 mg/kg            | 106              | 67.0                  | 130  |
|                                                          |                   | EP231X: Perfluoroheptane sulfonic acid (PFHpS) | 375-92-8   | 0.00125 mg/kg            | 114              | 70.0                  | 132  |
|                                                          |                   | EP231X: Perfluorooctane sulfonic acid (PFOS)   | 1763-23-1  | 0.00125 mg/kg            | 119              | 68.0                  | 136  |
|                                                          |                   | EP231X: Perfluorodecane sulfonic acid (PFDS)   | 335-77-3   | 0.00125 mg/kg            | 114              | 59.0                  | 134  |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4370443)   |                   |                                                |            |                          |                  |                       |      |
| EB2213834-009                                            | Anonymous         | EP231X: Perfluorobutane sulfonic acid (PFBS)   | 375-73-5   | 0.00125 mg/kg            | 120              | 72.0                  | 128  |
|                                                          |                   | EP231X: Perfluoropentane sulfonic acid (PFPeS) | 2706-91-4  | 0.00125 mg/kg            | 123              | 73.0                  | 123  |
|                                                          |                   | EP231X: Perfluorohexane sulfonic acid (PFHxS)  | 355-46-4   | 0.00125 mg/kg            | 106              | 67.0                  | 130  |
|                                                          |                   | EP231X: Perfluoroheptane sulfonic acid (PFHpS) | 375-92-8   | 0.00125 mg/kg            | 116              | 70.0                  | 132  |
|                                                          |                   | EP231X: Perfluorooctane sulfonic acid (PFOS)   | 1763-23-1  | 0.00125 mg/kg            | 92.4             | 68.0                  | 136  |
|                                                          |                   | EP231X: Perfluorodecane sulfonic acid (PFDS)   | 335-77-3   | 0.00125 mg/kg            | 113              | 59.0                  | 134  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4370431) |                   |                                                |            |                          |                  |                       |      |
| EP2205953-001                                            | 0960_SS125_220517 | 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            | 108              | 69.0                  | 132  |
|                                                          |                   | EP231X: Perfluorohexanoic acid (PFHxA)         | 307-24-4   | 0.00125 mg/kg            | 118              | 70.0                  | 132  |
|                                                          |                   | EP231X: Perfluoroheptanoic acid (PFHpA)        | 375-85-9   | 0.00125 mg/kg            | 120              | 71.0                  | 131  |
|                                                          |                   | EP231X: Perfluorooctanoic acid (PFOA)          | 335-67-1   | 0.00125 mg/kg            | 130              | 69.0                  | 133  |
|                                                          |                   | EP231X: Perfluorononanoic acid (PFNA)          | 375-95-1   | 0.00125 mg/kg            | 119              | 72.0                  | 129  |
|                                                          |                   | EP231X: Perfluorodecanoic acid (PFDA)          | 335-76-2   | 0.00125 mg/kg            | 129              | 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            | 126              | 69.0                  | 135  |
|                                                          |                   | EP231X: Perfluorotridecanoic acid (PFTrDA)     | 72629-94-8 | 0.00125 mg/kg            | 110              | 66.0                  | 139  |
|                                                          |                   | EP231X: Perfluorotetradecanoic acid (PFTeDA)   | 376-06-7   | 0.00312 mg/kg            | 118              | 69.0                  | 133  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4370443) |                   |                                                |            |                          |                  |                       |      |
| EB2213834-009                                            | Anonymous         | EP231X: Perfluorobutanoic acid (PFBA)          | 375-22-4   | 0.00625 mg/kg            | 98.7             | 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            | 105              | 70.0                  | 132  |
|                                                          |                   | EP231X: Perfluoroheptanoic acid (PFHpA)        | 375-85-9   | 0.00125 mg/kg            | 126              | 71.0                  | 131  |
|                                                          |                   | EP231X: Perfluorooctanoic acid (PFOA)          | 335-67-1   | 0.00125 mg/kg            | 120              | 69.0                  | 133  |
|                                                          |                   | EP231X: Perfluorononanoic acid (PFNA)          | 375-95-1   | 0.00125 mg/kg            | 122              | 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            | 127              | 64.0                  | 136  |



Sub-Matrix: **SOIL**

| 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: 4370443) - continued |                   |                                                                   |             |                          |                  |                       |      |
| EB2213834-009                                                        | Anonymous         | EP231X: Perfluorododecanoic acid (PFDoDA)                         | 307-55-1    | 0.00125 mg/kg            | 115              | 69.0                  | 135  |
|                                                                      |                   | EP231X: Perfluorotridecanoic acid (PFTrDA)                        | 72629-94-8  | 0.00125 mg/kg            | 101              | 66.0                  | 139  |
|                                                                      |                   | EP231X: Perfluorotetradecanoic acid (PFTeDA)                      | 376-06-7    | 0.00312 mg/kg            | 94.2             | 69.0                  | 133  |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4370431)                 |                   |                                                                   |             |                          |                  |                       |      |
| EP2205953-001                                                        | 0960_SS125_220517 | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.00125 mg/kg            | 120              | 67.0                  | 137  |
|                                                                      |                   | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.00312 mg/kg            | 120              | 71.6                  | 129  |
|                                                                      |                   | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.00312 mg/kg            | 123              | 69.8                  | 131  |
|                                                                      |                   | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.00312 mg/kg            | 114              | 68.7                  | 130  |
|                                                                      |                   | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.00312 mg/kg            | 102              | 65.1                  | 134  |
|                                                                      |                   | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9   | 0.00125 mg/kg            | 111              | 63.0                  | 144  |
|                                                                      |                   | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.00125 mg/kg            | 116              | 61.0                  | 139  |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4370443)                 |                   |                                                                   |             |                          |                  |                       |      |
| EB2213834-009                                                        | Anonymous         | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.00125 mg/kg            | 124              | 67.0                  | 137  |
|                                                                      |                   | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.00312 mg/kg            | 121              | 71.6                  | 129  |
|                                                                      |                   | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.00312 mg/kg            | 109              | 69.8                  | 131  |
|                                                                      |                   | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.00312 mg/kg            | 112              | 68.7                  | 130  |
|                                                                      |                   | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.00312 mg/kg            | 113              | 65.1                  | 134  |
|                                                                      |                   | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9   | 0.00125 mg/kg            | 117              | 63.0                  | 144  |
|                                                                      |                   | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.00125 mg/kg            | 119              | 61.0                  | 139  |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4370431)          |                   |                                                                   |             |                          |                  |                       |      |
| EP2205953-001                                                        | 0960_SS125_220517 | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.00125 mg/kg            | 109              | 62.0                  | 145  |
|                                                                      |                   | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 27619-97-2  | 0.00125 mg/kg            | 125              | 64.0                  | 140  |
|                                                                      |                   | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | 39108-34-4  | 0.00125 mg/kg            | 118              | 65.0                  | 137  |
|                                                                      |                   | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | 120226-60-0 | 0.00125 mg/kg            | 111              | 69.2                  | 143  |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4370443)          |                   |                                                                   |             |                          |                  |                       |      |
| EB2213834-009                                                        | Anonymous         | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.00125 mg/kg            | 105              | 62.0                  | 145  |
|                                                                      |                   | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 27619-97-2  | 0.00125 mg/kg            | 109              | 64.0                  | 140  |
|                                                                      |                   | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | 39108-34-4  | 0.00125 mg/kg            | 113              | 65.0                  | 137  |



Sub-Matrix: SOIL

| Sub-Matrix: <b>SOIL</b>                                                 |           |                                                     |             | 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: 4370443) - continued |           |                                                     |             |                          |                  |                       |      |
| EB2213834-009                                                           | Anonymous | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS) | 120226-60-0 | 0.00125 mg/kg            | 112              | 69.2                  | 143  |

## QA/QC Compliance Assessment to assist with Quality Review

|              |                             |                         |                                |
|--------------|-----------------------------|-------------------------|--------------------------------|
| Work Order   | : EP2205953                 | Page                    | : 1 of 7                       |
| Client       | : STANTEC AUSTRALIA PTY LTD | Laboratory              | : Environmental Division Perth |
| Contact      | : [REDACTED]                | Telephone               | : +61-8-9406 1301              |
| Project      | : WA_0960_PFASOMP           | Date Samples Received   | : 20-May-2022                  |
| Site         | : DEF19009/Learmonth        | Issue Date              | : 01-Jun-2022                  |
| Sampler      | : [REDACTED]                | No. of samples received | : 36                           |
| Order number | : DEF19009/0960             | No. of samples analysed | : 35                           |

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.

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.

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.

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                             | Sample Date        | Extraction / Preparation |                    |            | Analysis           |                  |            |
|----------------------------------------------------|--------------------|--------------------------|--------------------|------------|--------------------|------------------|------------|
| Container / Client Sample ID(s)                    |                    | Date extracted           | Due for extraction | Evaluation | Date analysed      | Due for analysis | Evaluation |
| <b>EA055: Moisture Content (Dried @ 105-110°C)</b> |                    |                          |                    |            |                    |                  |            |
| <b>HDPE Soil Jar (EA055)</b>                       | <b>17-May-2022</b> | ----                     | ----               | ----       | <b>29-May-2022</b> | 31-May-2022      | ✓          |
| 0960_SS125_220517,                                 | 0960_SS276_220517, |                          |                    |            |                    |                  |            |
| 0960_SS122_220517,                                 | 0960_QC105_220517, |                          |                    |            |                    |                  |            |
| 0960_SS121_220517,                                 | 0960_SS124_220517, |                          |                    |            |                    |                  |            |
| 0960_SS277_220517,                                 | 0960_SS123_220517, |                          |                    |            |                    |                  |            |
| 0960_SS114_220517,                                 | 0960_SS113_220517, |                          |                    |            |                    |                  |            |
| 0960_SS235_220517,                                 | 0960_SS234_220517, |                          |                    |            |                    |                  |            |
| 0960_SS231_220517,                                 | 0960_SS265_220517, |                          |                    |            |                    |                  |            |
| 0960_QC106_220517,                                 | 0960_SS170_220517, |                          |                    |            |                    |                  |            |
| 0960_SS108_220517,                                 | 0960_SS200_220517, |                          |                    |            |                    |                  |            |
| 0960_QC107_220517,                                 | 0960_SD199_220517, |                          |                    |            |                    |                  |            |
| 0960_SS227_220517,                                 | 0960_SS189_220517, |                          |                    |            |                    |                  |            |
| 0960_SS190_220517,                                 | 0960_SS291_220517, |                          |                    |            |                    |                  |            |
| 0960_SS174_220517,                                 | 0960_SS243_220517, |                          |                    |            |                    |                  |            |
| 0960_SD219_220517,                                 | 0960_SS157_220517, |                          |                    |            |                    |                  |            |
| 0960_SD205_220517,                                 | 0960_SS301_220517, |                          |                    |            |                    |                  |            |
| 0960_SS279_220517,                                 | 0960_SD208_220517, |                          |                    |            |                    |                  |            |
| 0960_SS168_220517,                                 | 0960_SS298_220517, |                          |                    |            |                    |                  |            |
| 0960_SS166_220517                                  |                    |                          |                    |            |                    |                  |            |





Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                  |                    | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |
|-----------------------------------------|--------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|
| Container / Client Sample ID(s)         |                    |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| EP231A: Perfluoroalkyl Sulfonic Acids   |                    |             |                          |                    |            |               |                  |            |
| HDPE Soil Jar (EP231X)                  |                    | 17-May-2022 | 31-May-2022              | 13-Nov-2022        | ✔          | 31-May-2022   | 10-Jul-2022      | ✔          |
| 0960_SS125_220517,                      | 0960_SS276_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS122_220517,                      | 0960_QC105_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS121_220517,                      | 0960_SS124_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS277_220517,                      | 0960_SS123_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS114_220517,                      | 0960_SS113_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS235_220517,                      | 0960_SS234_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS231_220517,                      | 0960_SS265_220517, |             |                          |                    |            |               |                  |            |
| 0960_QC106_220517,                      | 0960_SS170_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS108_220517,                      | 0960_SS200_220517, |             |                          |                    |            |               |                  |            |
| 0960_QC107_220517,                      | 0960_SD199_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS227_220517,                      | 0960_SS189_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS190_220517,                      | 0960_SS291_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS174_220517,                      | 0960_SS243_220517, |             |                          |                    |            |               |                  |            |
| 0960_SD219_220517,                      | 0960_SS157_220517, |             |                          |                    |            |               |                  |            |
| 0960_SD205_220517,                      | 0960_SS301_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS279_220517,                      | 0960_SD208_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS168_220517,                      | 0960_SS298_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS166_220517                       |                    |             |                          |                    |            |               |                  |            |
| EP231B: Perfluoroalkyl Carboxylic Acids |                    |             |                          |                    |            |               |                  |            |
| HDPE Soil Jar (EP231X)                  |                    | 17-May-2022 | 31-May-2022              | 13-Nov-2022        | ✔          | 31-May-2022   | 10-Jul-2022      | ✔          |
| 0960_SS125_220517,                      | 0960_SS276_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS122_220517,                      | 0960_QC105_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS121_220517,                      | 0960_SS124_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS277_220517,                      | 0960_SS123_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS114_220517,                      | 0960_SS113_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS235_220517,                      | 0960_SS234_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS231_220517,                      | 0960_SS265_220517, |             |                          |                    |            |               |                  |            |
| 0960_QC106_220517,                      | 0960_SS170_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS108_220517,                      | 0960_SS200_220517, |             |                          |                    |            |               |                  |            |
| 0960_QC107_220517,                      | 0960_SD199_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS227_220517,                      | 0960_SS189_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS190_220517,                      | 0960_SS291_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS174_220517,                      | 0960_SS243_220517, |             |                          |                    |            |               |                  |            |
| 0960_SD219_220517,                      | 0960_SS157_220517, |             |                          |                    |            |               |                  |            |
| 0960_SD205_220517,                      | 0960_SS301_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS279_220517,                      | 0960_SD208_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS168_220517,                      | 0960_SS298_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS166_220517                       |                    |             |                          |                    |            |               |                  |            |



Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                     |                    | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |
|--------------------------------------------|--------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|
| Container / Client Sample ID(s)            |                    |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| EP231C: Perfluoroalkyl Sulfonamides        |                    |             |                          |                    |            |               |                  |            |
| HDPE Soil Jar (EP231X)                     |                    | 17-May-2022 | 31-May-2022              | 13-Nov-2022        | ✓          | 31-May-2022   | 10-Jul-2022      | ✓          |
| 0960_SS125_220517,                         | 0960_SS276_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS122_220517,                         | 0960_QC105_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS121_220517,                         | 0960_SS124_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS277_220517,                         | 0960_SS123_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS114_220517,                         | 0960_SS113_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS235_220517,                         | 0960_SS234_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS231_220517,                         | 0960_SS265_220517, |             |                          |                    |            |               |                  |            |
| 0960_QC106_220517,                         | 0960_SS170_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS108_220517,                         | 0960_SS200_220517, |             |                          |                    |            |               |                  |            |
| 0960_QC107_220517,                         | 0960_SD199_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS227_220517,                         | 0960_SS189_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS190_220517,                         | 0960_SS291_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS174_220517,                         | 0960_SS243_220517, |             |                          |                    |            |               |                  |            |
| 0960_SD219_220517,                         | 0960_SS157_220517, |             |                          |                    |            |               |                  |            |
| 0960_SD205_220517,                         | 0960_SS301_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS279_220517,                         | 0960_SD208_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS168_220517,                         | 0960_SS298_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS166_220517                          |                    |             |                          |                    |            |               |                  |            |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids |                    |             |                          |                    |            |               |                  |            |
| HDPE Soil Jar (EP231X)                     |                    | 17-May-2022 | 31-May-2022              | 13-Nov-2022        | ✓          | 31-May-2022   | 10-Jul-2022      | ✓          |
| 0960_SS125_220517,                         | 0960_SS276_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS122_220517,                         | 0960_QC105_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS121_220517,                         | 0960_SS124_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS277_220517,                         | 0960_SS123_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS114_220517,                         | 0960_SS113_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS235_220517,                         | 0960_SS234_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS231_220517,                         | 0960_SS265_220517, |             |                          |                    |            |               |                  |            |
| 0960_QC106_220517,                         | 0960_SS170_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS108_220517,                         | 0960_SS200_220517, |             |                          |                    |            |               |                  |            |
| 0960_QC107_220517,                         | 0960_SD199_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS227_220517,                         | 0960_SS189_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS190_220517,                         | 0960_SS291_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS174_220517,                         | 0960_SS243_220517, |             |                          |                    |            |               |                  |            |
| 0960_SD219_220517,                         | 0960_SS157_220517, |             |                          |                    |            |               |                  |            |
| 0960_SD205_220517,                         | 0960_SS301_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS279_220517,                         | 0960_SD208_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS168_220517,                         | 0960_SS298_220517, |             |                          |                    |            |               |                  |            |
| 0960_SS166_220517                          |                    |             |                          |                    |            |               |                  |            |





## Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

| Quality Control Sample Type                          |        | Count |         | Rate (%) |          |            | Quality Control Specification  |
|------------------------------------------------------|--------|-------|---------|----------|----------|------------|--------------------------------|
| Analytical Methods                                   | Method | QC    | Regular | Actual   | Expected | Evaluation |                                |
|                                                      |        |       |         |          |          |            |                                |
| Laboratory Duplicates (DUP)                          |        |       |         |          |          |            |                                |
| Moisture Content                                     | EA055  | 6     | 60      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 4     | 37      | 10.81    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Laboratory Control Samples (LCS)                     |        |       |         |          |          |            |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 2     | 37      | 5.41     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Method Blanks (MB)                                   |        |       |         |          |          |            |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 2     | 37      | 5.41     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Matrix Spikes (MS)                                   |        |       |         |          |          |            |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 2     | 37      | 5.41     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |



## Brief Method Summaries

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

| Analytical Methods                                   | Method | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------------------------------------------|--------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Moisture Content                                     | EA055  | SOIL   | In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | SOIL   | In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements. |
| Preparation Methods                                  | Method | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| QuEChERS Extraction of Solids                        | ORG71  | SOIL   | In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.                                                                                                                                                                                                                                   |



# CHAIN OF CUSTODY

ALS COC#: 37750

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: DEF19009/Learmonth SED MBMG

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:  
/ ES2019CARBSD0002

## SAMPLE DETAILS

## ANALYSIS REQUIRED

| SAMPLE | NAME       | DESCRIPTION | DATE / TIME            | MATRIX | TOTAL BOTTLES        | ON HOLD | Sediments SEDIMENT | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|------------|-------------|------------------------|--------|----------------------|---------|--------------------|----------------------|------------------------|
| 001    | 0960_SD288 |             | 18/05/2022<br>08:03 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 002    | 0960_SS193 |             | 18/05/2022<br>08:17 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 003    | 0960_QC111 |             | 18/05/2022<br>08:18 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 004    | 0960_SS192 |             | 18/05/2022<br>08:26 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 005    | 0960_SD305 |             | 18/05/2022<br>08:40 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 006    | 0960_SD304 |             | 18/05/2022<br>08:59 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 007    | 0960_SD303 |             | 18/05/2022<br>09:00 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 008    | 0060_SD301 |             | 18/05/2022<br>09:13 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 009    | 0960_SD300 |             | 18/05/2022<br>09:25 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |



**CHAIN OF CUSTODY**

COC#: 37750

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: DEF19009/Learmonth SED MBMG

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:

/ ES2019CARBSD0002

**LABORATORY USE ONLY (Circle)**

Custody Seal intact? Yes 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 | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|------------|-------------|------------------------|--------|----------------------|---------|--------------------|----------------------|------------------------|
| 010    | 0960_SD211 |             | 18/05/2022<br>09:41 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 011    | 0960_SS198 |             | 18/05/2022<br>09:57 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 012    | 0960_QC112 |             | 18/05/2022<br>09:58 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 013    | 0960_SD210 |             | 18/05/2022<br>09:59 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 014    | 0960_SD302 |             | 18/05/2022<br>10:07 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 015    | 0960_SD209 |             | 18/05/2022<br>10:16 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 016    | 0960_SS293 |             | 18/05/2022<br>10:27 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 017    | 0960_SS292 |             | 18/05/2022<br>10:27 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |
| 018    | 0960_SD207 |             | 18/05/2022<br>10:38 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | Partial<br>1/4     |                      |                        |



# CHAIN OF CUSTODY

COC#: 37750

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: DEF19009/Learmonth SED MBMG

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:

/ ES2019CARBSD0002

## LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes 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    | 0960_SD288  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 002    | 0960_SS193  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 003    | 0960_QC111  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 004    | 0960_SS192  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 005    | 0960_SD305  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 006    | 0960_SD304  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 007    | 0960_SD303  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 008    | 0060_SD301  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 009    | 0960_SD300  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 010    | 0960_SD211  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 011    | 0960_SS198  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 012    | 0960_QC112  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 013    | 0960_SD210  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 014    | 0960_SD302  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 015    | 0960_SD209  | Sediments SEDIMENT          | Soil   | - EP231X (solids) PFAS - Full Suite (28 analytes) |



# CHAIN OF CUSTODY

COC#: 37750

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: DEF19009/Learmonth SED MBMG

ORDER NO: DEF19009/0960

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

## LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLER MOBILE:  
/ ES2019CARBSD0002

|     |            |                    |      |                                                   |
|-----|------------|--------------------|------|---------------------------------------------------|
| 016 | 0960_SS293 | Sediments SEDIMENT | Soil | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 017 | 0960_SS292 | Sediments SEDIMENT | Soil | - EP231X (solids) PFAS - Full Suite (28 analytes) |
| 018 | 0960_SD207 | Sediments SEDIMENT | Soil | - EP231X (solids) PFAS - Full Suite (28 analytes) |

**CHAIN OF CUSTODY**

COC#: 37750

ALS Laboratory: EP Perth

RELINQUISHED BY:

DATE TIME:

RECEIVED BY:

DATE TIME:

RELINQUISHED BY:

DATE TIME:

RECEIVED BY:

DATE TIME:

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: DEF19009/Learmonth SED MBMG

ORDER NO: DEF19009/0960

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

SAMPLER MOBILE:

/ ES2019CARBSD0002

**LABORATORY USE ONLY (Circle)**

Custody Seal intact? Yes 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    | 0960_SD288  | HDPE Soil Jar | 200 mL | 00621019107814 | Grey | No       |        |
| 002    | 0960_SS193  | HDPE Soil Jar | 200 mL | 00621019097732 | Grey | No       |        |
| 003    | 0960_QC111  | HDPE Soil Jar | 200 mL | 00620719063169 | Grey | No       |        |
| 004    | 0960_SS192  | HDPE Soil Jar | 200 mL | 00621019097685 | Grey | No       |        |
| 005    | 0960_SD305  | HDPE Soil Jar | 200 mL | 00621019107811 | Grey | No       |        |
| 006    | 0960_SD304  | HDPE Soil Jar | 200 mL | 00621019097764 | Grey | No       |        |
| 007    | 0960_SD303  | HDPE Soil Jar | 200 mL | 00620719063201 | Grey | No       |        |
| 008    | 0060_SD301  | HDPE Soil Jar | 200 mL | 00620719063177 | Grey | No       |        |
| 009    | 0960_SD300  | HDPE Soil Jar | 200 mL | 00621019097718 | Grey | No       |        |
| 010    | 0960_SD211  | HDPE Soil Jar | 200 mL | 00621019107802 | Grey | No       |        |
| 011    | 0960_SS198  | HDPE Soil Jar | 200 mL | 00621019097701 | Grey | No       |        |
| 012    | 0960_QC112  | HDPE Soil Jar | 200 mL | 00621019097733 | Grey | No       |        |
| 013    | 0960_SD210  | HDPE Soil Jar | 200 mL | 00621019097752 | Grey | No       |        |
| 014    | 0960_SD302  | HDPE Soil Jar | 200 mL | 00621019097739 | Grey | No       |        |
| 015    | 0960_SD209  | HDPE Soil Jar | 200 mL | 00621019097693 | Grey | No       |        |
| 016    | 0960_SS293  | HDPE Soil Jar | 200 mL | 00621019097768 | Grey | No       |        |
| 017    | 0960_SS292  | HDPE Soil Jar | 200 mL | 00620719063117 | Grey | No       |        |
| 018    | 0960_SD207  | HDPE Soil Jar | 200 mL | 00621019097692 | Grey | No       |        |

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

# SAMPLE RECEIPT INFORMATION & BOTTLE TYPE

WORKORDER No:

Sorting Times  
(Only record for BP, Mobil  
& URS)

## Temperature Details

To be completed by Sample Receipt

## Packaging

Courier Details (Mandatory for Quarantine)

Carrier:

CIVIC DIRECT TOLL TNT

CLIENT Other: \_\_\_\_\_

Con Note:

Samples  
checked,  
labelled  
and put in  
trays by:

Initial:

Sample  
Temp:

.....°C

21.5°C

Security Seal  
Intact?

Circle below

☐ YES (Security seal  
intact)

☐ NO (Security seal broken)

☒ NA (No security seal  
used)

Packaging  
Type

No.

Hard Esky

2

Foam Esky

Other:

Chilling Method -

☒ Ice

☐ Ice Bricks

☐ No Chilling

Time Sorting Commenced:

Time Placed in Fridge:

Sorting to Fridge Target Time  
<1 Hour

Client:

VOC analysis may be compromised as sample containers contained headspace (list / Details of any samples damaged during transit:

Sample Receipt Advice Comments - To be completed by Sorting Staff

Other Information (eg. Were bottles received that weren't completely filled) (eg. If sample temperature is above 6°C add further detail here - Internal use only - Not for SRN):

## SAMPLE RECEIPT NOTIFICATION (SRN)

**Work Order : EP2205969**

|                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Client : <b>STANTEC AUSTRALIA PTY LTD</b></p> <p>Contact : [REDACTED]</p> <p>Address : 41 BISHOP ST<br/>JOLIMONT PERTH, WESTERN<br/>AUSTRALIA 6014</p> <p>E-mail : [REDACTED]@cardno.com.au</p> <p>Telephone : ----</p> <p>Facsimile : ----</p> <p>Project : WA_0960_PFASOMP</p> <p>Order number : DEF19009/0960</p> <p>C-O-C number : 37750</p> <p>Site : DEF19009/Learmonth</p> <p>Sampler : [REDACTED]</p> | <p>Laboratory : Environmental Division Perth</p> <p>Contact : Customer Services EP</p> <p>Address : 26 Rigali Way Wangara WA Australia<br/>6065</p> <p>E-mail : ALSEnviro.Perth@alsglobal.com</p> <p>Telephone : +61-8-9406 1301</p> <p>Facsimile : +61-8-9406 1399</p> <p>Page : 1 of 3</p> <p>Quote number : ES2022MWHAUS0002 (SY/139/19 B)</p> <p>QC Level : NEPM 2013 B3 &amp; ALS QC Standard</p> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Dates

|                                           |                                               |
|-------------------------------------------|-----------------------------------------------|
| Date Samples Received : 20-May-2022 11:30 | Issue Date : 23-May-2022                      |
| Client Requested Due : 01-Jun-2022        | Scheduled Reporting Date : <b>01-Jun-2022</b> |
| Date                                      |                                               |

### Delivery Details

|                            |                                              |
|----------------------------|----------------------------------------------|
| Mode of Delivery : Carrier | Security Seal : Not Available                |
| No. of coolers/boxes : 2   | Temperature : 21.5 - Ice present             |
| Receipt Detail :           | No. of samples received / analysed : 18 / 18 |

### General Comments

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





## Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exists.

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: SOIL

| Laboratory sample ID | Sampling date / time | Sample ID         | SOIL - EA055-103 Moisture Content | SOIL - EP231X (solids) PFAS - Full Suite (28 analytes) |
|----------------------|----------------------|-------------------|-----------------------------------|--------------------------------------------------------|
| EP2205969-001        | 18-May-2022 08:03    | 0960_SD288_220518 | ✓                                 | ✓                                                      |
| EP2205969-002        | 18-May-2022 08:17    | 0960_SS193_220518 | ✓                                 | ✓                                                      |
| EP2205969-003        | 18-May-2022 08:18    | 0960_QC111_220518 | ✓                                 | ✓                                                      |
| EP2205969-004        | 18-May-2022 08:26    | 0960_SS192_220518 | ✓                                 | ✓                                                      |
| EP2205969-005        | 18-May-2022 08:40    | 0960_SD305_220518 | ✓                                 | ✓                                                      |
| EP2205969-006        | 18-May-2022 08:59    | 0960_SD304_220518 | ✓                                 | ✓                                                      |
| EP2205969-007        | 18-May-2022 09:00    | 0960_SD303_220518 | ✓                                 | ✓                                                      |
| EP2205969-008        | 18-May-2022 09:13    | 0060_SD301_220518 | ✓                                 | ✓                                                      |
| EP2205969-009        | 18-May-2022 09:25    | 0960_SD300_220518 | ✓                                 | ✓                                                      |
| EP2205969-010        | 18-May-2022 09:41    | 0960_SD211_220518 | ✓                                 | ✓                                                      |
| EP2205969-011        | 18-May-2022 09:57    | 0960_SS198_220518 | ✓                                 | ✓                                                      |
| EP2205969-012        | 18-May-2022 09:58    | 0960_QC112_220518 | ✓                                 | ✓                                                      |
| EP2205969-013        | 18-May-2022 09:59    | 0960_SD210_220518 | ✓                                 | ✓                                                      |
| EP2205969-014        | 18-May-2022 10:07    | 0960_SD302_220518 | ✓                                 | ✓                                                      |
| EP2205969-015        | 18-May-2022 10:16    | 0960_SD209_220518 | ✓                                 | ✓                                                      |
| EP2205969-016        | 18-May-2022 10:27    | 0960_SS293_220518 | ✓                                 | ✓                                                      |
| EP2205969-017        | 18-May-2022 10:27    | 0960_SS292_220518 | ✓                                 | ✓                                                      |
| EP2205969-018        | 18-May-2022 10:38    | 0960_SD207_220518 | ✓                                 | ✓                                                      |

## Proactive Holding Time Report

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



## Requested Deliverables

██████████ ██████████

- A4 - AU Tax Invoice (INV)

Email ██████████ cardno.com.au

### DERP LAB 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 - ESDAT (ESDAT)
- EDI Format - XTab (XTAB)

Email derp.labreports@esdat.com.au  
Email derp.labreports@esdat.com.au  
Email derp.labreports@esdat.com.au  
Email derp.labreports@esdat.com.au  
Email derp.labreports@esdat.com.au  
Email derp.labreports@esdat.com.au  
Email derp.labreports@esdat.com.au

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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 - ESDAT (ESDAT)
- EDI Format - XTab (XTAB)

Email ██████████ cardno.com.au  
Email ██████████ cardno.com.au  
Email ██████████ cardno.com.au  
Email ██████████ cardno.com.au  
Email ██████████ cardno.com.au  
Email ██████████ cardno.com.au  
Email ██████████ cardno.com.au

### RICCARDO DIVITA

- A4 - AU Tax Invoice (INV)

Email Riccardo.divita@cardno.com.au

## CERTIFICATE OF ANALYSIS

**Work Order** : **EP2205969**  
**Client** : **STANTEC AUSTRALIA PTY LTD**  
**Contact** : [REDACTED]  
**Address** : 41 BISHOP ST  
 JOLIMONT PERTH, WESTERN AUSTRALIA 6014  
**Telephone** : ----  
**Project** : WA\_0960\_PFASOMP  
**Order number** : DEF19009/0960  
**C-O-C number** : 37750  
**Sampler** : [REDACTED]  
**Site** : DEF19009/Learmonth  
**Quote number** : SY/139/19 B  
**No. of samples received** : 18  
**No. of samples analysed** : 18

**Page** : 1 of 11  
**Laboratory** : Environmental Division Perth  
**Contact** : Customer Services EP  
**Address** : 26 Rigali Way Wangara Western Australia Australia 6065  
**Telephone** : +61-8-9406 1301  
**Date Samples Received** : 20-May-2022 11:30  
**Date Analysis Commenced** : 29-May-2022  
**Issue Date** : 02-Jun-2022 12:59



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             |
|------------------------------------------------------------------------|------------------|------------------------------------|
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator | Sydney Inorganics, Smithfield, NSW |
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator | Sydney Organics, Smithfield, NSW   |



## 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.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- 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

|                                                    |            |        |       | 0960_SD288_220518 | 0960_SS193_220518 | 0960_QC111_220518 | 0960_SS192_220518 | 0960_SD305_220518 |
|----------------------------------------------------|------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                               |            |        |       | 18-May-2022 08:03 | 18-May-2022 08:17 | 18-May-2022 08:18 | 18-May-2022 08:26 | 18-May-2022 08:40 |
| Compound                                           | CAS Number | LOR    | Unit  | EP2205969-001     | EP2205969-002     | EP2205969-003     | EP2205969-004     | EP2205969-005     |
|                                                    |            |        |       | Result            | Result            | Result            | Result            | Result            |
| <b>EA055: Moisture Content (Dried @ 105-110°C)</b> |            |        |       |                   |                   |                   |                   |                   |
| Moisture Content                                   | ----       | 0.1    | %     | 15.8              | 22.2              | 19.0              | 24.0              | 17.4              |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>       |            |        |       |                   |                   |                   |                   |                   |
| 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            | 0.0004            | 0.0038            | <0.0002           |
| Perfluorodecane sulfonic acid (PFDS)               | 335-77-3   | 0.0002 | mg/kg | <0.0002           | <0.0002           | <0.0002           | <0.0002           | <0.0002           |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>     |            |        |       |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>         |            |        |       |                   |                   |                   |                   |                   |
| 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<br>(Matrix: SOIL)                    |                    |        |       | Sample ID | 0960_SD288_220518 | 0960_SS193_220518 | 0960_QC111_220518 | 0960_SS192_220518 | 0960_SD305_220518 |
|-----------------------------------------------------------|--------------------|--------|-------|-----------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                      |                    |        |       |           | 18-May-2022 08:03 | 18-May-2022 08:17 | 18-May-2022 08:18 | 18-May-2022 08:26 | 18-May-2022 08:40 |
| Compound                                                  | CAS Number         | LOR    | Unit  |           | EP2205969-001     | EP2205969-002     | EP2205969-003     | EP2205969-004     | EP2205969-005     |
|                                                           |                    |        |       | Result    | Result            | Result            | Result            | Result            | Result            |
| <b>EP231C: Perfluoroalkyl Sulfonamides - Continued</b>    |                    |        |       |           |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>         |                    |        |       |           |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231P: PFAS Sums</b>                                  |                    |        |       |           |                   |                   |                   |                   |                   |
| Sum of PFAS                                               | ----               | 0.0002 | mg/kg | 0.0034    | 0.0002            | 0.0004            | 0.0038            | <0.0002           |                   |
| Sum of PFHxS and PFOS                                     | 355-46-4/1763-23-1 | 0.0002 | mg/kg | 0.0034    | 0.0002            | 0.0004            | 0.0038            | <0.0002           |                   |
| Sum of PFAS (WA DER List)                                 | ----               | 0.0002 | mg/kg | 0.0034    | 0.0002            | 0.0004            | 0.0038            | <0.0002           |                   |
| <b>EP231S: PFAS Surrogate</b>                             |                    |        |       |           |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                 | ----               | 0.0002 | %     | 89.5      | 100               | 104               | 92.5              | 96.5              |                   |
| 13C8-PFOA                                                 | ----               | 0.0002 | %     | 104       | 101               | 104               | 116               | 112               |                   |





## Analytical Results

Sub-Matrix: SEDIMENT  
 (Matrix: SOIL)

Sample ID

| Sub-Matrix: SEDIMENT<br>(Matrix: SOIL)        |            |        |       | Sample ID         | 0960_SD304_220518 | 0960_SD303_220518 | 0060_SD301_220518 | 0960_SD300_220518 | 0960_SD211_220518 |
|-----------------------------------------------|------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                          |            |        |       | 18-May-2022 08:59 | 18-May-2022 09:00 | 18-May-2022 09:13 | 18-May-2022 09:25 | 18-May-2022 09:41 |                   |
| Compound                                      | CAS Number | LOR    | Unit  | EP2205969-006     | EP2205969-007     | EP2205969-008     | EP2205969-009     | EP2205969-010     |                   |
|                                               |            |        |       | Result            | Result            | Result            | Result            | Result            |                   |
| EA055: Moisture Content (Dried @ 105-110°C)   |            |        |       |                   |                   |                   |                   |                   |                   |
| Moisture Content                              | ----       | 0.1    | %     | 25.3              | 23.4              | 20.2              | 27.8              | 21.4              |                   |
| 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           | 0.0003            | 0.0007            | 0.0006            |                   |
| 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: SEDIMENT  
 (Matrix: SOIL)

Sample ID

|                                                           |                    |        |       | 0960_SD304_220518 | 0960_SD303_220518 | 0060_SD301_220518 | 0960_SD300_220518 | 0960_SD211_220518 |
|-----------------------------------------------------------|--------------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                      |                    |        |       | 18-May-2022 08:59 | 18-May-2022 09:00 | 18-May-2022 09:13 | 18-May-2022 09:25 | 18-May-2022 09:41 |
| Compound                                                  | CAS Number         | LOR    | Unit  | EP2205969-006     | EP2205969-007     | EP2205969-008     | EP2205969-009     | EP2205969-010     |
|                                                           |                    |        |       | Result            | Result            | Result            | Result            | Result            |
| <b>EP231C: Perfluoroalkyl Sulfonamides - Continued</b>    |                    |        |       |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>         |                    |        |       |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231P: PFAS Sums</b>                                  |                    |        |       |                   |                   |                   |                   |                   |
| Sum of PFAS                                               | ----               | 0.0002 | mg/kg | <0.0002           | <0.0002           | 0.0003            | 0.0007            | 0.0006            |
| Sum of PFHxS and PFOS                                     | 355-46-4/1763-23-1 | 0.0002 | mg/kg | <0.0002           | <0.0002           | 0.0003            | 0.0007            | 0.0006            |
| Sum of PFAS (WA DER List)                                 | ----               | 0.0002 | mg/kg | <0.0002           | <0.0002           | 0.0003            | 0.0007            | 0.0006            |
| <b>EP231S: PFAS Surrogate</b>                             |                    |        |       |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                 | ----               | 0.0002 | %     | 99.0              | 108               | 108               | 106               | 99.0              |
| 13C8-PFOA                                                 | ----               | 0.0002 | %     | 109               | 101               | 104               | 110               | 112               |



## Analytical Results

Sub-Matrix: SEDIMENT  
 (Matrix: SOIL)

Sample ID

|                                                    |            |        |       | 0960_SS198_220518 | 0960_QC112_220518 | 0960_SD210_220518 | 0960_SD302_220518 | 0960_SD209_220518 |
|----------------------------------------------------|------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                               |            |        |       | 18-May-2022 09:57 | 18-May-2022 09:58 | 18-May-2022 09:59 | 18-May-2022 10:07 | 18-May-2022 10:16 |
| Compound                                           | CAS Number | LOR    | Unit  | EP2205969-011     | EP2205969-012     | EP2205969-013     | EP2205969-014     | EP2205969-015     |
|                                                    |            |        |       | Result            | Result            | Result            | Result            | Result            |
| <b>EA055: Moisture Content (Dried @ 105-110°C)</b> |            |        |       |                   |                   |                   |                   |                   |
| Moisture Content                                   | ----       | 0.1    | %     | 11.7              | 11.1              | 18.1              | 22.4              | 23.2              |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>       |            |        |       |                   |                   |                   |                   |                   |
| 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 | 0.0031            | 0.0030            | 0.0010            | <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           |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>     |            |        |       |                   |                   |                   |                   |                   |
| 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 (PFTTrDA)                | 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           |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>         |            |        |       |                   |                   |                   |                   |                   |
| 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

|                                                           |                    |        |       | 0960_SS198_220518 | 0960_QC112_220518 | 0960_SD210_220518 | 0960_SD302_220518 | 0960_SD209_220518 |
|-----------------------------------------------------------|--------------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                      |                    |        |       | 18-May-2022 09:57 | 18-May-2022 09:58 | 18-May-2022 09:59 | 18-May-2022 10:07 | 18-May-2022 10:16 |
| Compound                                                  | CAS Number         | LOR    | Unit  | EP2205969-011     | EP2205969-012     | EP2205969-013     | EP2205969-014     | EP2205969-015     |
|                                                           |                    |        |       | Result            | Result            | Result            | Result            | Result            |
| <b>EP231C: Perfluoroalkyl Sulfonamides - Continued</b>    |                    |        |       |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>         |                    |        |       |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231P: PFAS Sums</b>                                  |                    |        |       |                   |                   |                   |                   |                   |
| Sum of PFAS                                               | ----               | 0.0002 | mg/kg | 0.0031            | 0.0030            | 0.0010            | <0.0002           | <0.0002           |
| Sum of PFHxS and PFOS                                     | 355-46-4/1763-23-1 | 0.0002 | mg/kg | 0.0031            | 0.0030            | 0.0010            | <0.0002           | <0.0002           |
| Sum of PFAS (WA DER List)                                 | ----               | 0.0002 | mg/kg | 0.0031            | 0.0030            | 0.0010            | <0.0002           | <0.0002           |
| <b>EP231S: PFAS Surrogate</b>                             |                    |        |       |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                 | ----               | 0.0002 | %     | 90.0              | 116               | 110               | 99.5              | 93.5              |
| 13C8-PFOA                                                 | ----               | 0.0002 | %     | 104               | 106               | 109               | 107               | 108               |



## Analytical Results

Sub-Matrix: SEDIMENT  
 (Matrix: SOIL)

Sample ID

|                                                    |            |        |       | 0960_SS293_220518 | 0960_SS292_220518 | 0960_SD207_220518 | ----  | ----  |
|----------------------------------------------------|------------|--------|-------|-------------------|-------------------|-------------------|-------|-------|
| Sampling date / time                               |            |        |       | 18-May-2022 10:27 | 18-May-2022 10:27 | 18-May-2022 10:38 | ----  | ----  |
| Compound                                           | CAS Number | LOR    | Unit  | EP2205969-016     | EP2205969-017     | EP2205969-018     | ----- | ----- |
|                                                    |            |        |       | Result            | Result            | Result            | ----  | ----  |
| <b>EA055: Moisture Content (Dried @ 105-110°C)</b> |            |        |       |                   |                   |                   |       |       |
| Moisture Content                                   | ----       | 0.1    | %     | 5.1               | 10.4              | 21.8              | ----  | ----  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>       |            |        |       |                   |                   |                   |       |       |
| 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            | 0.0005            | <0.0002           | ----  | ----  |
| Perfluorodecane sulfonic acid (PFDS)               | 335-77-3   | 0.0002 | mg/kg | <0.0002           | <0.0002           | <0.0002           | ----  | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>     |            |        |       |                   |                   |                   |       |       |
| 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           | ----  | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>         |            |        |       |                   |                   |                   |       |       |
| 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

|                                                           |                    |        |       | 0960_SS293_220518 | 0960_SS292_220518 | 0960_SD207_220518 | ----  | ----  |
|-----------------------------------------------------------|--------------------|--------|-------|-------------------|-------------------|-------------------|-------|-------|
| Sampling date / time                                      |                    |        |       | 18-May-2022 10:27 | 18-May-2022 10:27 | 18-May-2022 10:38 | ----  | ----  |
| Compound                                                  | CAS Number         | LOR    | Unit  | EP2205969-016     | EP2205969-017     | EP2205969-018     | ----- | ----- |
|                                                           |                    |        |       | Result            | Result            | Result            | ----  | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides - Continued</b>    |                    |        |       |                   |                   |                   |       |       |
| 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           | ----  | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>         |                    |        |       |                   |                   |                   |       |       |
| 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           | ----  | ----  |
| <b>EP231P: PFAS Sums</b>                                  |                    |        |       |                   |                   |                   |       |       |
| Sum of PFAS                                               | ----               | 0.0002 | mg/kg | <b>0.0005</b>     | <b>0.0005</b>     | <0.0002           | ----  | ----  |
| Sum of PFHxS and PFOS                                     | 355-46-4/1763-23-1 | 0.0002 | mg/kg | <b>0.0005</b>     | <b>0.0005</b>     | <0.0002           | ----  | ----  |
| Sum of PFAS (WA DER List)                                 | ----               | 0.0002 | mg/kg | <b>0.0005</b>     | <b>0.0005</b>     | <0.0002           | ----  | ----  |
| <b>EP231S: PFAS Surrogate</b>                             |                    |        |       |                   |                   |                   |       |       |
| 13C4-PFOS                                                 | ----               | 0.0002 | %     | <b>108</b>        | <b>105</b>        | <b>95.5</b>       | ----  | ----  |
| 13C8-PFOA                                                 | ----               | 0.0002 | %     | <b>104</b>        | <b>110</b>        | <b>104</b>        | ----  | ----  |

Page : 11 of 11  
Work Order : EP2205969  
Client : STANTEC AUSTRALIA PTY LTD  
Project : WA\_0960\_PFASOMP



### Surrogate Control Limits

| Sub-Matrix: <b>SEDIMENT</b>   |            | Recovery Limits (%) |      |
|-------------------------------|------------|---------------------|------|
| Compound                      | CAS Number | Low                 | High |
| <b>EP231S: PFAS Surrogate</b> |            |                     |      |
| <b>13C4-PFOS</b>              | ----       | 60                  | 120  |
| <b>13C8-PFOA</b>              | ----       | 60                  | 120  |

### Inter-Laboratory Testing

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



## QUALITY CONTROL REPORT

**Work Order** : **EP2205969**  
**Client** : **STANTEC AUSTRALIA PTY LTD**  
**Contact** : **[REDACTED]**  
**Address** : **41 BISHOP ST**  
**JOLIMONT PERTH, WESTERN AUSTRALIA 6014**  
**Telephone** : **----**  
**Project** : **WA\_0960\_PFASOMP**  
**Order number** : **DEF19009/0960**  
**C-O-C number** : **37750**  
**Sampler** : **[REDACTED]**  
**Site** : **DEF19009/Learmonth**  
**Quote number** : **SY/139/19 B**  
**No. of samples received** : **18**  
**No. of samples analysed** : **18**

**Page** : 1 of 11  
**Laboratory** : Environmental Division Perth  
**Contact** : Customer Services EP  
**Address** : 26 Rigali Way Wangara Western Australia Australia 6065  
**Telephone** : +61-8-9406 1301  
**Date Samples Received** : 20-May-2022  
**Date Analysis Commenced** : 29-May-2022  
**Issue Date** : 02-Jun-2022



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]  | LCMS Coordinator | Sydney Inorganics, Smithfield, NSW |
| [REDACTED]  | LCMS Coordinator | Sydney Organics, Smithfield, NSW   |



## 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: 4367008) |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2205953-024                                                 | Anonymous         | EA055: Moisture Content                        | ----       | 0.1                               | %     | 18.3            | 19.2             | 4.6     | 0% - 20%           |
| EP2205953-036                                                 | Anonymous         | EA055: Moisture Content                        | ----       | 0.1                               | %     | 8.4             | 8.3              | 0.0     | 0% - 20%           |
| EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4367009) |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2205969-009                                                 | 0960_SD300_220518 | EA055: Moisture Content                        | ----       | 0.1                               | %     | 27.8            | 27.6             | 1.1     | 0% - 20%           |
| EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4371501)       |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2205969-001                                                 | 0960_SD288_220518 | 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 | 0.0034          | 0.0033           | 5.0     | 0% - 50%           |
|                                                               |                   | EP231X: Perfluorodecane sulfonic acid (PFDS)   | 335-77-3   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
| EP2206452-014                                                 | Anonymous         | EP231X: Perfluorobutane sulfonic acid (PFBS)   | 375-73-5   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                               |                   | EP231X: Perfluoropentane sulfonic acid (PFPeS) | 2706-91-4  | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                               |                   | EP231X: Perfluorohexane sulfonic acid (PFHxS)  | 355-46-4   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                               |                   | EP231X: Perfluoroheptane sulfonic acid (PFHpS) | 375-92-8   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                               |                   | EP231X: Perfluorooctane sulfonic acid (PFOS)   | 1763-23-1  | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                               |                   | EP231X: Perfluorodecane sulfonic acid (PFDS)   | 335-77-3   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
| EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4371504)       |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2205969-007                                                 | 0960_SD303_220518 | 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           |



| 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: 4371504) - continued |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2205969-007                                                       | 0960_SD303_220518 | EP231X: Perfluorodecane sulfonic acid (PFDS)   | 335-77-3   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
| EP2205969-017                                                       | 0960_SS292_220518 | 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          | 0.0007           | 26.0    | 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: 4371501)           |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2205969-001                                                       | 0960_SD288_220518 | 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           |
| EP2206452-014                                                       | Anonymous         | EP231X: Perfluoropentanoic acid (PFPeA)        | 2706-90-3  | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                     |                   | EP231X: Perfluorohexanoic acid (PFHxA)         | 307-24-4   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                     |                   | EP231X: Perfluoroheptanoic acid (PFHpA)        | 375-85-9   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                     |                   | EP231X: Perfluorooctanoic acid (PFOA)          | 335-67-1   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                     |                   | EP231X: Perfluorononanoic acid (PFNA)          | 375-95-1   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                     |                   | EP231X: Perfluorodecanoic acid (PFDA)          | 335-76-2   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                     |                   | EP231X: Perfluoroundecanoic acid (PFUnDA)      | 2058-94-8  | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                     |                   | EP231X: Perfluorododecanoic acid (PFDoDA)      | 307-55-1   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                     |                   | EP231X: Perfluorotridecanoic acid (PFTrDA)     | 72629-94-8 | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                     |                   | EP231X: Perfluorotetradecanoic acid (PFTeDA)   | 376-06-7   | 0.0005                            | mg/kg | <0.0005         | <0.0005          | 0.0     | No Limit           |
|                                                                     |                   | EP231X: Perfluorobutanoic acid (PFBA)          | 375-22-4   | 0.001                             | mg/kg | <0.001          | <0.001           | 0.0     | No Limit           |
| EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4371504)           |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2205969-007                                                       | 0960_SD303_220518 | 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           |

| 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: 4371504) - continued |                   |                                                                   |            |                                   |       |                 |                  |         |                    |
| EP2205969-007                                                         | 0960_SD303_220518 | 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           |
| EP2205969-017                                                         | 0960_SS292_220518 | 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: 4371501)             |            |                                   |       |                 |                  |         |                    |
| EP2205969-001                                                         | 0960_SD288_220518 | 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           |
| EP2206452-014                                                         | 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           |
| EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4371504)                 |                   |                                                                   |            |                                   |       |                 |                  |         |                    |



| 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: 4371504) - continued |                   |                                                                   |             |                                   |       |                 |                  |         |                    |
| EP2205969-007                                                     | 0960_SD303_220518 | 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           |
| EP2205969-017                                                     | 0960_SS292_220518 | 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: 4371501)      |                   |                                                                   |             |                                   |       |                 |                  |         |                    |
| EP2205969-001                                                     | 0960_SD288_220518 | 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           |
| EP2206452-014                                                     | 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           |

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 Client : STANTEC AUSTRALIA PTY LTD  
 Project : WA\_0960\_PFASOMP



| 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: 4371504) - continued |                   |                                                     |             |                                   |       |                 |                  |         |                    |
| EP2206452-014                                                            | Anonymous         | 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: 4371504)             |                   |                                                     |             |                                   |       |                 |                  |         |                    |
| EP2205969-007                                                            | 0960_SD303_220518 | 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           |
| EP2205969-017                                                            | 0960_SS292_220518 | 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           |



## 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**

| Sub-Matrix: SOIL                                         |            |        |       | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                    |                       |     |
|----------------------------------------------------------|------------|--------|-------|-----------------------------|---------------------------------------|--------------------|-----------------------|-----|
|                                                          |            |        |       |                             | Spike<br>Concentration                | Spike Recovery (%) | Acceptable Limits (%) |     |
| Method: Compound                                         | CAS Number | LOR    | Unit  | Result                      |                                       |                    | LCS                   | Low |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4371501)   |            |        |       |                             |                                       |                    |                       |     |
| EP231X: Perfluorobutane sulfonic acid (PFBS)             | 375-73-5   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 96.0               | 72.0                  | 128 |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)           | 2706-91-4  | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 109                | 73.0                  | 123 |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)            | 355-46-4   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 104                | 67.0                  | 130 |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)           | 375-92-8   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 115                | 70.0                  | 132 |
| EP231X: Perfluorooctane sulfonic acid (PFOS)             | 1763-23-1  | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 99.2               | 68.0                  | 136 |
| EP231X: Perfluorodecane sulfonic acid (PFDS)             | 335-77-3   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 116                | 59.0                  | 134 |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4371504)   |            |        |       |                             |                                       |                    |                       |     |
| EP231X: Perfluorobutane sulfonic acid (PFBS)             | 375-73-5   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 103                | 72.0                  | 128 |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)           | 2706-91-4  | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 108                | 73.0                  | 123 |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)            | 355-46-4   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 102                | 67.0                  | 130 |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)           | 375-92-8   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 110                | 70.0                  | 132 |
| EP231X: Perfluorooctane sulfonic acid (PFOS)             | 1763-23-1  | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 108                | 68.0                  | 136 |
| EP231X: Perfluorodecane sulfonic acid (PFDS)             | 335-77-3   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 113                | 59.0                  | 134 |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4371501) |            |        |       |                             |                                       |                    |                       |     |
| EP231X: Perfluorobutanoic acid (PFBA)                    | 375-22-4   | 0.001  | mg/kg | <0.001                      | 0.00625 mg/kg                         | 101                | 71.0                  | 135 |
| EP231X: Perfluoropentanoic acid (PFPeA)                  | 2706-90-3  | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 101                | 69.0                  | 132 |
| EP231X: Perfluorohexanoic acid (PFHxA)                   | 307-24-4   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 107                | 70.0                  | 132 |
| EP231X: Perfluoroheptanoic acid (PFHpA)                  | 375-85-9   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 108                | 71.0                  | 131 |
| EP231X: Perfluorooctanoic acid (PFOA)                    | 335-67-1   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 118                | 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                         | 108                | 69.0                  | 133 |
| EP231X: Perfluoroundecanoic acid (PFUnDA)                | 2058-94-8  | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 123                | 64.0                  | 136 |
| EP231X: Perfluorododecanoic acid (PFDoDA)                | 307-55-1   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 118                | 69.0                  | 135 |
| EP231X: Perfluorotridecanoic acid (PFTrDA)               | 72629-94-8 | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 115                | 66.0                  | 139 |
| EP231X: Perfluorotetradecanoic acid (PFTeDA)             | 376-06-7   | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 103                | 69.0                  | 133 |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4371504) |            |        |       |                             |                                       |                    |                       |     |
| EP231X: Perfluorobutanoic acid (PFBA)                    | 375-22-4   | 0.001  | mg/kg | <0.001                      | 0.00625 mg/kg                         | 102                | 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                         | 118                | 70.0                  | 132 |
| EP231X: Perfluoroheptanoic acid (PFHpA)                  | 375-85-9   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 114                | 71.0                  | 131 |
| EP231X: Perfluorooctanoic acid (PFOA)                    | 335-67-1   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 119                | 69.0                  | 133 |
| EP231X: Perfluorononanoic acid (PFNA)                    | 375-95-1   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 114                | 72.0                  | 129 |
| EP231X: Perfluorodecanoic acid (PFDA)                    | 335-76-2   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 108                | 69.0                  | 133 |
| EP231X: Perfluoroundecanoic acid (PFUnDA)                | 2058-94-8  | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 109                | 64.0                  | 136 |





Sub-Matrix: **SOIL**

| Sub-Matrix: SOIL                                                     |             |        |       | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |     |
|----------------------------------------------------------------------|-------------|--------|-------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|-----|
|                                                                      |             |        |       |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |     |
| Method: Compound                                                     | CAS Number  | LOR    | Unit  | Result                      |                                       |                           |                                   |     |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4371504) - continued |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: Perfluorododecanoic acid (PFDoDA)                            | 307-55-1    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 121                       | 69.0                              | 135 |
| EP231X: Perfluorotridecanoic acid (PFTrDA)                           | 72629-94-8  | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 112                       | 66.0                              | 139 |
| EP231X: Perfluorotetradecanoic acid (PFTeDA)                         | 376-06-7    | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 106                       | 69.0                              | 133 |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4371501)                 |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: Perfluorooctane sulfonamide (FOSA)                           | 754-91-6    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 121                       | 67.0                              | 137 |
| EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)                | 31506-32-8  | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 111                       | 71.6                              | 129 |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)                 | 4151-50-2   | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 98.9                      | 69.8                              | 131 |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)         | 24448-09-7  | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 92.0                      | 68.7                              | 130 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)          | 1691-99-2   | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 98.9                      | 65.1                              | 134 |
| EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)    | 2355-31-9   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 119                       | 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 |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4371504)                 |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: Perfluorooctane sulfonamide (FOSA)                           | 754-91-6    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 111                       | 67.0                              | 137 |
| EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)                | 31506-32-8  | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 105                       | 71.6                              | 129 |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)                 | 4151-50-2   | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 92.0                      | 69.8                              | 131 |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)         | 24448-09-7  | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 103                       | 68.7                              | 130 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)          | 1691-99-2   | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 98.9                      | 65.1                              | 134 |
| EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)    | 2355-31-9   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 116                       | 63.0                              | 144 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)     | 2991-50-6   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 118                       | 61.0                              | 139 |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4371501)          |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                    | 757124-72-4 | 0.0005 | mg/kg | <0.0005                     | 0.00125 mg/kg                         | 110                       | 62.0                              | 145 |
| EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                    | 27619-97-2  | 0.0005 | mg/kg | <0.0005                     | 0.00125 mg/kg                         | 82.8                      | 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                         | 112                       | 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                         | 127                       | 69.2                              | 143 |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4371504)          |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                    | 757124-72-4 | 0.0005 | mg/kg | <0.0005                     | 0.00125 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                     | 0.00125 mg/kg                         | 100                       | 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                         | 120                       | 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                         | 114                       | 69.2                              | 143 |



## 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**

| 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: 4371501)   |                   |                                                |            |                          |                  |                       |      |
| EP2205969-001                                            | 0960_SD288_220518 | EP231X: Perfluorobutane sulfonic acid (PFBS)   | 375-73-5   | 0.00125 mg/kg            | 102              | 72.0                  | 128  |
|                                                          |                   | EP231X: Perfluoropentane sulfonic acid (PFPeS) | 2706-91-4  | 0.00125 mg/kg            | 114              | 73.0                  | 123  |
|                                                          |                   | EP231X: Perfluorohexane sulfonic acid (PFHxS)  | 355-46-4   | 0.00125 mg/kg            | 106              | 67.0                  | 130  |
|                                                          |                   | EP231X: Perfluoroheptane sulfonic acid (PFHpS) | 375-92-8   | 0.00125 mg/kg            | 122              | 70.0                  | 132  |
|                                                          |                   | EP231X: Perfluorooctane sulfonic acid (PFOS)   | 1763-23-1  | 0.00125 mg/kg            | 69.6             | 68.0                  | 136  |
|                                                          |                   | EP231X: Perfluorodecane sulfonic acid (PFDS)   | 335-77-3   | 0.00125 mg/kg            | 115              | 59.0                  | 134  |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4371504)   |                   |                                                |            |                          |                  |                       |      |
| EP2205969-007                                            | 0960_SD303_220518 | EP231X: Perfluorobutane sulfonic acid (PFBS)   | 375-73-5   | 0.00125 mg/kg            | 112              | 72.0                  | 128  |
|                                                          |                   | EP231X: Perfluoropentane sulfonic acid (PFPeS) | 2706-91-4  | 0.00125 mg/kg            | 119              | 73.0                  | 123  |
|                                                          |                   | EP231X: Perfluorohexane sulfonic acid (PFHxS)  | 355-46-4   | 0.00125 mg/kg            | 112              | 67.0                  | 130  |
|                                                          |                   | EP231X: Perfluoroheptane sulfonic acid (PFHpS) | 375-92-8   | 0.00125 mg/kg            | 126              | 70.0                  | 132  |
|                                                          |                   | EP231X: Perfluorooctane sulfonic acid (PFOS)   | 1763-23-1  | 0.00125 mg/kg            | 120              | 68.0                  | 136  |
|                                                          |                   | EP231X: Perfluorodecane sulfonic acid (PFDS)   | 335-77-3   | 0.00125 mg/kg            | 117              | 59.0                  | 134  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4371501) |                   |                                                |            |                          |                  |                       |      |
| EP2205969-001                                            | 0960_SD288_220518 | EP231X: Perfluorobutanoic acid (PFBA)          | 375-22-4   | 0.00625 mg/kg            | 98.4             | 71.0                  | 135  |
|                                                          |                   | EP231X: Perfluoropentanoic acid (PFPeA)        | 2706-90-3  | 0.00125 mg/kg            | 96.0             | 69.0                  | 132  |
|                                                          |                   | EP231X: Perfluorohexanoic acid (PFHxA)         | 307-24-4   | 0.00125 mg/kg            | 108              | 70.0                  | 132  |
|                                                          |                   | EP231X: Perfluoroheptanoic acid (PFHpA)        | 375-85-9   | 0.00125 mg/kg            | 107              | 71.0                  | 131  |
|                                                          |                   | EP231X: Perfluorooctanoic acid (PFOA)          | 335-67-1   | 0.00125 mg/kg            | 117              | 69.0                  | 133  |
|                                                          |                   | EP231X: Perfluorononanoic acid (PFNA)          | 375-95-1   | 0.00125 mg/kg            | 104              | 72.0                  | 129  |
|                                                          |                   | EP231X: Perfluorodecanoic acid (PFDA)          | 335-76-2   | 0.00125 mg/kg            | 113              | 69.0                  | 133  |
|                                                          |                   | EP231X: Perfluoroundecanoic acid (PFUnDA)      | 2058-94-8  | 0.00125 mg/kg            | 121              | 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            | 112              | 66.0                  | 139  |
|                                                          |                   | EP231X: Perfluorotetradecanoic acid (PFTeDA)   | 376-06-7   | 0.00312 mg/kg            | 113              | 69.0                  | 133  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4371504) |                   |                                                |            |                          |                  |                       |      |
| EP2205969-007                                            | 0960_SD303_220518 | EP231X: Perfluorobutanoic acid (PFBA)          | 375-22-4   | 0.00625 mg/kg            | 108              | 71.0                  | 135  |
|                                                          |                   | EP231X: Perfluoropentanoic acid (PFPeA)        | 2706-90-3  | 0.00125 mg/kg            | 120              | 69.0                  | 132  |
|                                                          |                   | EP231X: Perfluorohexanoic acid (PFHxA)         | 307-24-4   | 0.00125 mg/kg            | 117              | 70.0                  | 132  |
|                                                          |                   | EP231X: Perfluoroheptanoic acid (PFHpA)        | 375-85-9   | 0.00125 mg/kg            | 121              | 71.0                  | 131  |
|                                                          |                   | EP231X: Perfluorooctanoic acid (PFOA)          | 335-67-1   | 0.00125 mg/kg            | 120              | 69.0                  | 133  |
|                                                          |                   | EP231X: Perfluorononanoic acid (PFNA)          | 375-95-1   | 0.00125 mg/kg            | 119              | 72.0                  | 129  |
|                                                          |                   | EP231X: Perfluorodecanoic acid (PFDA)          | 335-76-2   | 0.00125 mg/kg            | 122              | 69.0                  | 133  |
|                                                          |                   | EP231X: Perfluoroundecanoic acid (PFUnDA)      | 2058-94-8  | 0.00125 mg/kg            | 118              | 64.0                  | 136  |



Sub-Matrix: **SOIL**

| 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: 4371504) - continued |                   |                                                                   |             |                          |                  |                       |      |
| EP2205969-007                                                        | 0960_SD303_220518 | EP231X: Perfluorododecanoic acid (PFDoDA)                         | 307-55-1    | 0.00125 mg/kg            | 105              | 69.0                  | 135  |
|                                                                      |                   | EP231X: Perfluorotridecanoic acid (PFTrDA)                        | 72629-94-8  | 0.00125 mg/kg            | 114              | 66.0                  | 139  |
|                                                                      |                   | EP231X: Perfluorotetradecanoic acid (PFTeDA)                      | 376-06-7    | 0.00312 mg/kg            | 112              | 69.0                  | 133  |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4371501)                 |                   |                                                                   |             |                          |                  |                       |      |
| EP2205969-001                                                        | 0960_SD288_220518 | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.00125 mg/kg            | 117              | 67.0                  | 137  |
|                                                                      |                   | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.00312 mg/kg            | 102              | 71.6                  | 129  |
|                                                                      |                   | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.00312 mg/kg            | 98.1             | 69.8                  | 131  |
|                                                                      |                   | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.00312 mg/kg            | 99.5             | 68.7                  | 130  |
|                                                                      |                   | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.00312 mg/kg            | 104              | 65.1                  | 134  |
|                                                                      |                   | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9   | 0.00125 mg/kg            | 122              | 63.0                  | 144  |
|                                                                      |                   | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.00125 mg/kg            | 101              | 61.0                  | 139  |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4371504)                 |                   |                                                                   |             |                          |                  |                       |      |
| EP2205969-007                                                        | 0960_SD303_220518 | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.00125 mg/kg            | 112              | 67.0                  | 137  |
|                                                                      |                   | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.00312 mg/kg            | 112              | 71.6                  | 129  |
|                                                                      |                   | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.00312 mg/kg            | 98.7             | 69.8                  | 131  |
|                                                                      |                   | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.00312 mg/kg            | 107              | 68.7                  | 130  |
|                                                                      |                   | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.00312 mg/kg            | 102              | 65.1                  | 134  |
|                                                                      |                   | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9   | 0.00125 mg/kg            | 118              | 63.0                  | 144  |
|                                                                      |                   | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.00125 mg/kg            | 123              | 61.0                  | 139  |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4371501)          |                   |                                                                   |             |                          |                  |                       |      |
| EP2205969-001                                                        | 0960_SD288_220518 | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.00125 mg/kg            | 106              | 62.0                  | 145  |
|                                                                      |                   | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 27619-97-2  | 0.00125 mg/kg            | 86.8             | 64.0                  | 140  |
|                                                                      |                   | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | 39108-34-4  | 0.00125 mg/kg            | 109              | 65.0                  | 137  |
|                                                                      |                   | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | 120226-60-0 | 0.00125 mg/kg            | 88.0             | 69.2                  | 143  |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4371504)          |                   |                                                                   |             |                          |                  |                       |      |
| EP2205969-007                                                        | 0960_SD303_220518 | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.00125 mg/kg            | 119              | 62.0                  | 145  |
|                                                                      |                   | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 27619-97-2  | 0.00125 mg/kg            | 109              | 64.0                  | 140  |
|                                                                      |                   | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | 39108-34-4  | 0.00125 mg/kg            | 111              | 65.0                  | 137  |



Sub-Matrix: SOIL

| Sub-Matrix: <b>SOIL</b>                                                 |                   |                                                     |             | 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: 4371504) - continued |                   |                                                     |             |                          |                  |                       |      |
| EP2205969-007                                                           | 0960_SD303_220518 | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS) | 120226-60-0 | 0.00125 mg/kg            | 124              | 69.2                  | 143  |

## QA/QC Compliance Assessment to assist with Quality Review

|              |                             |                         |                                |
|--------------|-----------------------------|-------------------------|--------------------------------|
| Work Order   | : EP2205969                 | Page                    | : 1 of 6                       |
| Client       | : STANTEC AUSTRALIA PTY LTD | Laboratory              | : Environmental Division Perth |
| Contact      | : [REDACTED]                | Telephone               | : +61-8-9406 1301              |
| Project      | : WA_0960_PFASOMP           | Date Samples Received   | : 20-May-2022                  |
| Site         | : DEF19009/Learmonth        | Issue Date              | : 02-Jun-2022                  |
| Sampler      | : [REDACTED]                | No. of samples received | : 18                           |
| Order number | : DEF19009/0960             | No. of samples analysed | : 18                           |

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

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

### Summary of Outliers

#### Outliers : Quality Control Samples

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

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- **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: **SOIL**

| Quality Control Sample Type | Count |         | Rate (%) |          | Quality Control Specification  |
|-----------------------------|-------|---------|----------|----------|--------------------------------|
| Method                      | QC    | Regular | Actual   | Expected |                                |
| Laboratory Duplicates (DUP) |       |         |          |          |                                |
| Moisture Content            | 3     | 32      | 9.38     | 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      |                  |            |                    |
|---------------------------------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|--------------------|
| Container / Client Sample ID(s)             |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |                    |
| EA055: Moisture Content (Dried @ 105-110°C) |             |                          |                    |            |               |                  |            |                    |
| HDPE Soil Jar (EA055)                       | 18-May-2022 | ----                     | ----               | ----       | 29-May-2022   | 01-Jun-2022      | ✔          |                    |
| 0960_SD288_220518,                          |             |                          |                    |            |               |                  |            | 0960_SS193_220518, |
| 0960_QC111_220518,                          |             |                          |                    |            |               |                  |            | 0960_SS192_220518, |
| 0960_SD305_220518,                          |             |                          |                    |            |               |                  |            | 0960_SD304_220518, |
| 0960_SD303_220518,                          |             |                          |                    |            |               |                  |            | 0060_SD301_220518, |
| 0960_SD300_220518,                          |             |                          |                    |            |               |                  |            | 0960_SD211_220518, |
| 0960_SS198_220518,                          |             |                          |                    |            |               |                  |            | 0960_QC112_220518, |
| 0960_SD210_220518,                          |             |                          |                    |            |               |                  |            | 0960_SD302_220518, |
| 0960_SS292_220518,                          |             |                          |                    |            |               |                  |            | 0960_SD207_220518, |
| EP231A: Perfluoroalkyl Sulfonic Acids       |             |                          |                    |            |               |                  |            |                    |
| HDPE Soil Jar (EP231X)                      | 18-May-2022 | 31-May-2022              | 14-Nov-2022        | ✔          | 01-Jun-2022   | 10-Jul-2022      | ✔          |                    |
| 0960_SD288_220518,                          |             |                          |                    |            |               |                  |            | 0960_SS193_220518, |
| 0960_QC111_220518,                          |             |                          |                    |            |               |                  |            | 0960_SS192_220518, |
| 0960_SD305_220518,                          |             |                          |                    |            |               |                  |            | 0960_SD304_220518, |
| 0960_SD303_220518,                          |             |                          |                    |            |               |                  |            | 0060_SD301_220518, |
| 0960_SD300_220518,                          |             |                          |                    |            |               |                  |            | 0960_SD211_220518, |
| 0960_SS198_220518,                          |             |                          |                    |            |               |                  |            | 0960_QC112_220518, |
| 0960_SD210_220518,                          |             |                          |                    |            |               |                  |            | 0960_SD302_220518, |
| 0960_SS292_220518,                          |             |                          |                    |            |               |                  |            | 0960_SD207_220518, |

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                     |                    | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |
|--------------------------------------------|--------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|
| Container / Client Sample ID(s)            |                    |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| EP231B: Perfluoroalkyl Carboxylic Acids    |                    |             |                          |                    |            |               |                  |            |
| HDPE Soil Jar (EP231X)                     |                    | 18-May-2022 | 31-May-2022              | 14-Nov-2022        | ✓          | 01-Jun-2022   | 10-Jul-2022      | ✓          |
| 0960_SD288_220518,                         | 0960_SS193_220518, |             |                          |                    |            |               |                  |            |
| 0960_QC111_220518,                         | 0960_SS192_220518, |             |                          |                    |            |               |                  |            |
| 0960_SD305_220518,                         | 0960_SD304_220518, |             |                          |                    |            |               |                  |            |
| 0960_SD303_220518,                         | 0060_SD301_220518, |             |                          |                    |            |               |                  |            |
| 0960_SD300_220518,                         | 0960_SD211_220518, |             |                          |                    |            |               |                  |            |
| 0960_SS198_220518,                         | 0960_QC112_220518, |             |                          |                    |            |               |                  |            |
| 0960_SD210_220518,                         | 0960_SD302_220518, |             |                          |                    |            |               |                  |            |
| 0960_SD209_220518,                         | 0960_SS293_220518, |             |                          |                    |            |               |                  |            |
| 0960_SS292_220518,                         | 0960_SD207_220518  |             |                          |                    |            |               |                  |            |
| EP231C: Perfluoroalkyl Sulfonamides        |                    |             |                          |                    |            |               |                  |            |
| HDPE Soil Jar (EP231X)                     |                    | 18-May-2022 | 31-May-2022              | 14-Nov-2022        | ✓          | 01-Jun-2022   | 10-Jul-2022      | ✓          |
| 0960_SD288_220518,                         | 0960_SS193_220518, |             |                          |                    |            |               |                  |            |
| 0960_QC111_220518,                         | 0960_SS192_220518, |             |                          |                    |            |               |                  |            |
| 0960_SD305_220518,                         | 0960_SD304_220518, |             |                          |                    |            |               |                  |            |
| 0960_SD303_220518,                         | 0060_SD301_220518, |             |                          |                    |            |               |                  |            |
| 0960_SD300_220518,                         | 0960_SD211_220518, |             |                          |                    |            |               |                  |            |
| 0960_SS198_220518,                         | 0960_QC112_220518, |             |                          |                    |            |               |                  |            |
| 0960_SD210_220518,                         | 0960_SD302_220518, |             |                          |                    |            |               |                  |            |
| 0960_SD209_220518,                         | 0960_SS293_220518, |             |                          |                    |            |               |                  |            |
| 0960_SS292_220518,                         | 0960_SD207_220518  |             |                          |                    |            |               |                  |            |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids |                    |             |                          |                    |            |               |                  |            |
| HDPE Soil Jar (EP231X)                     |                    | 18-May-2022 | 31-May-2022              | 14-Nov-2022        | ✓          | 01-Jun-2022   | 10-Jul-2022      | ✓          |
| 0960_SD288_220518,                         | 0960_SS193_220518, |             |                          |                    |            |               |                  |            |
| 0960_QC111_220518,                         | 0960_SS192_220518, |             |                          |                    |            |               |                  |            |
| 0960_SD305_220518,                         | 0960_SD304_220518, |             |                          |                    |            |               |                  |            |
| 0960_SD303_220518,                         | 0060_SD301_220518, |             |                          |                    |            |               |                  |            |
| 0960_SD300_220518,                         | 0960_SD211_220518, |             |                          |                    |            |               |                  |            |
| 0960_SS198_220518,                         | 0960_QC112_220518, |             |                          |                    |            |               |                  |            |
| 0960_SD210_220518,                         | 0960_SD302_220518, |             |                          |                    |            |               |                  |            |
| 0960_SD209_220518,                         | 0960_SS293_220518, |             |                          |                    |            |               |                  |            |
| 0960 SS292_220518,                         | 0960 SD207_220518  |             |                          |                    |            |               |                  |            |



Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                          | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |                    |
|---------------------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|--------------------|
| Container / Client Sample ID(s) |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |                    |
| EP231P: PFAS Sums               |             |                          |                    |            |               |                  |            |                    |
| HDPE Soil Jar (EP231X)          | 18-May-2022 | 31-May-2022              | 14-Nov-2022        | ✓          | 01-Jun-2022   | 10-Jul-2022      | ✓          |                    |
| 0960_SD288_220518,              |             |                          |                    |            |               |                  |            | 0960_SS193_220518, |
| 0960_QC111_220518,              |             |                          |                    |            |               |                  |            | 0960_SS192_220518, |
| 0960_SD305_220518,              |             |                          |                    |            |               |                  |            | 0960_SD304_220518, |
| 0960_SD303_220518,              |             |                          |                    |            |               |                  |            | 0060_SD301_220518, |
| 0960_SD300_220518,              |             |                          |                    |            |               |                  |            | 0960_SD211_220518, |
| 0960_SS198_220518,              |             |                          |                    |            |               |                  |            | 0960_QC112_220518, |
| 0960_SD210_220518,              |             |                          |                    |            |               |                  |            | 0960_SD302_220518, |
| 0960_SD209_220518,              |             |                          |                    |            |               |                  |            | 0960_SS293_220518, |
| 0960_SS292_220518,              |             |                          |                    |            |               |                  |            | 0960_SD207_220518  |



## Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

| Quality Control Sample Type                          |        | Count |         | Rate (%) |          |            | Quality Control Specification  |
|------------------------------------------------------|--------|-------|---------|----------|----------|------------|--------------------------------|
| Analytical Methods                                   | Method | QC    | Regular | Actual   | Expected | Evaluation |                                |
|                                                      |        |       |         |          |          |            |                                |
| Laboratory Duplicates (DUP)                          |        |       |         |          |          |            |                                |
| Moisture Content                                     | EA055  | 3     | 32      | 9.38     | 10.00    | ✖          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 4     | 32      | 12.50    | 10.00    | ✔          | NEPM 2013 B3 & ALS QC Standard |
| Laboratory Control Samples (LCS)                     |        |       |         |          |          |            |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 2     | 32      | 6.25     | 5.00     | ✔          | NEPM 2013 B3 & ALS QC Standard |
| Method Blanks (MB)                                   |        |       |         |          |          |            |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 2     | 32      | 6.25     | 5.00     | ✔          | NEPM 2013 B3 & ALS QC Standard |
| Matrix Spikes (MS)                                   |        |       |         |          |          |            |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 2     | 32      | 6.25     | 5.00     | ✔          | NEPM 2013 B3 & ALS QC Standard |



## Brief Method Summaries

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

| Analytical Methods                                   | Method | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------------------------------------------|--------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Moisture Content                                     | EA055  | SOIL   | In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | SOIL   | In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements. |
| Preparation Methods                                  | Method | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| QuEChERS Extraction of Solids                        | ORG71  | SOIL   | In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.                                                                                                                                                                                                                                   |



# CHAIN OF CUSTODY

COC#: 37751

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: DEF19009/Learmonth SW - MGMB

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:  
/ ES2019CARBSD0002

## SAMPLE DETAILS

## ANALYSIS REQUIRED

| SAMPLE | NAME       | DESCRIPTION | DATE / TIME         | MATRIX | TOTAL BOTTLES        | ON HOLD | Rinsate WATER | Surface Waters Primary WATER | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|------------|-------------|---------------------|--------|----------------------|---------|---------------|------------------------------|----------------------|------------------------|
| 001    | 0960_SW288 |             | 18/05/2022 08:07 AM | Water  | ALS: 3<br>Non ALS: 0 | No      |               | Partial 4/8                  |                      |                        |
| 002    | 0960_SW193 |             | 18/05/2022 08:20 AM | Water  | ALS: 3<br>Non ALS: 0 | No      |               | Partial 4/8                  |                      |                        |
| 003    | 0960_QC110 |             | 18/05/2022 08:21 AM | Water  | ALS: 3<br>Non ALS: 0 | No      |               | Partial 4/8                  |                      |                        |
| 004    | 0960_SW192 |             | 18/05/2022 08:29 AM | Water  | ALS: 3<br>Non ALS: 0 | No      |               | Partial 4/8                  |                      |                        |
| 005    | 0960_SW305 |             | 18/05/2022 08:43 AM | Water  | ALS: 3<br>Non ALS: 0 | No      |               | Partial 4/8                  |                      |                        |
| 006    | 0960_SW304 |             | 18/05/2022 09:03 AM | Water  | ALS: 3<br>Non ALS: 0 | No      |               | Partial 4/8                  |                      |                        |
| 007    | 0960_SW303 |             | 18/05/2022 09:05 AM | Water  | ALS: 3<br>Non ALS: 0 | No      |               | Partial 4/8                  |                      |                        |
| 008    | 0960_SW001 |             | 18/05/2022 09:17 AM | Water  | ALS: 3<br>Non ALS: 0 | No      |               | Partial 4/8                  |                      |                        |
| 009    | 0960_SW300 |             | 18/05/2022 09:28 AM | Water  | ALS: 3<br>Non ALS: 0 | No      |               | Partial 4/8                  |                      |                        |



# CHAIN OF CUSTODY

COC#: 37751

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: DEF19009/Learmonth SW - MGMB

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:  
/ ES2019CARBSD0002

## SAMPLE DETAILS

## ANALYSIS REQUIRED

| SAMPLE | NAME       | DESCRIPTION | DATE / TIME         | MATRIX | TOTAL BOTTLES        | ON HOLD | Rinse WATER | Surface Waters Primary WATER | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|------------|-------------|---------------------|--------|----------------------|---------|-------------|------------------------------|----------------------|------------------------|
| 010    | 0960_SW211 |             | 18/05/2022 09:42 AM | Water  | ALS: 3<br>Non ALS: 0 | No      |             | Partial 4/8                  |                      |                        |
| 011    | 0960_SW210 |             | 18/05/2022 09:59 AM | Water  | ALS: 3<br>Non ALS: 0 | No      |             | Partial 4/8                  |                      |                        |
| 012    | 0960_SW209 |             | 18/05/2022 10:11 AM | Water  | ALS: 3<br>Non ALS: 0 | No      |             | Partial 4/8                  |                      |                        |
| 013    | 0960_SW302 |             | 18/05/2022 10:18 AM | Water  | ALS: 3<br>Non ALS: 0 | No      |             | Partial 4/8                  |                      |                        |
| 014    | 0960_SW207 |             | 18/05/2022 10:30 AM | Water  | ALS: 3<br>Non ALS: 0 | No      |             | Partial 3/8                  |                      |                        |
| 015    | 0960_QC301 |             | 18/05/2022 11:43 AM | Water  | ALS: 2<br>Non ALS: 0 | No      | X           |                              |                      |                        |
| 016    | 0960_QC401 |             | 18/05/2022 11:44 AM | Water  | ALS: 2<br>Non ALS: 0 | No      | X           |                              |                      |                        |



# CHAIN OF CUSTODY

ALS COC#: 37751

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: DEF19009/Learmonth SW - MGMB

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:  
/ ES2019CARBSD0002

| SAMPLE | SAMPLE NAME | PARTIAL ANALYSIS GROUP NAME  | MATRIX | SELECTED ANALYSIS NAME                                                                                                                                                                                      |
|--------|-------------|------------------------------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 001    | 0960_SW288  | Surface Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 002    | 0960_SW193  | Surface Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 003    | 0960_QC110  | Surface Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 004    | 0960_SW192  | Surface Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 005    | 0960_SW305  | Surface Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 006    | 0960_SW304  | Surface Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 007    | 0960_SW303  | Surface Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 008    | 0960_SW001  | Surface Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 009    | 0960_SW300  | Surface Waters Primary WATER | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |



# CHAIN OF CUSTODY

COC#: 37751 ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: DEF19009/Learmonth SW - MGMB

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:  
/ ES2019CARBSD0002

|     |            |                              |       |                                                                                                                                                                                                             |
|-----|------------|------------------------------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 010 | 0960_SW211 | Surface Waters Primary WATER | Water | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 011 | 0960_SW210 | Surface Waters Primary WATER | Water | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 012 | 0960_SW209 | Surface Waters Primary WATER | Water | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 013 | 0960_SW302 | Surface Waters Primary WATER | Water | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 014 | 0960_SW207 | Surface Waters Primary WATER | Water | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes)                                          |





# CHAIN OF CUSTODY

COC#: 37751

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: DEF19009/Learmonth SW - MGMB

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:  
/ ES2019CARBSD0002

## LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes 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    | 0960_SW288  | Clear Plastic Bottle - Natural | 250 mL | 00070621172409 | Green | No       |        |
| 001    | 0960_SW288  | HDPE (no PTFE)                 | 20 mL  | 00350621041336 | Grey  | No       |        |
| 001    | 0960_SW288  | HDPE (no PTFE)                 | 20 mL  | 00352101058285 | Grey  | No       |        |
| 002    | 0960_SW193  | Clear Plastic Bottle - Natural | 250 mL | 00070621172425 | Green | No       |        |
| 002    | 0960_SW193  | HDPE (no PTFE)                 | 20 mL  | 00350621041453 | Grey  | No       |        |
| 002    | 0960_SW193  | HDPE (no PTFE)                 | 20 mL  | 00352101058174 | Grey  | No       |        |
| 003    | 0960_QC110  | Clear Plastic Bottle - Natural | 250 mL | 00070621191144 | Green | No       |        |
| 003    | 0960_QC110  | HDPE (no PTFE)                 | 20 mL  | 00352101071208 | Grey  | No       |        |
| 003    | 0960_QC110  | HDPE (no PTFE)                 | 20 mL  | 00352101071558 | Grey  | No       |        |
| 004    | 0960_SW192  | Clear Plastic Bottle - Natural | 250 mL | 00070621191181 | Green | No       |        |
| 004    | 0960_SW192  | HDPE (no PTFE)                 | 20 mL  | 00352101071954 | Grey  | No       |        |
| 004    | 0960_SW192  | HDPE (no PTFE)                 | 20 mL  | 00352101071199 | Grey  | No       |        |
| 005    | 0960_SW305  | Clear Plastic Bottle - Natural | 250 mL | 00070621172429 | Green | No       |        |
| 005    | 0960_SW305  | HDPE (no PTFE)                 | 20 mL  | 00352101058256 | Grey  | No       |        |
| 005    | 0960_SW305  | HDPE (no PTFE)                 | 20 mL  | 00352101058303 | Grey  | No       |        |
| 006    | 0960_SW304  | Clear Plastic Bottle - Natural | 250 mL | 00070621172437 | Green | No       |        |
| 006    | 0960_SW304  | HDPE (no PTFE)                 | 20 mL  | 00352101057913 | Grey  | No       |        |
| 006    | 0960_SW304  | HDPE (no PTFE)                 | 20 mL  | 00352101057819 | Grey  | No       |        |
| 007    | 0960_SW303  | Clear Plastic Bottle - Natural | 250 mL | 00070621191230 | Green | No       |        |
| 007    | 0960_SW303  | HDPE (no PTFE)                 | 20 mL  | 00352101071446 | Grey  | No       |        |
| 007    | 0960_SW303  | HDPE (no PTFE)                 | 20 mL  | 00352101071180 | Grey  | No       |        |
| 008    | 0960_SW001  | HDPE (no PTFE)                 | 20 mL  | 00352101057776 | Grey  | No       |        |
| 008    | 0960_SW001  | HDPE (no PTFE)                 | 20 mL  | 00352101058246 | Grey  | No       |        |
| 008    | 0960_SW001  | Clear Plastic Bottle - Natural | 250 mL | 00070621172398 | Green | No       |        |
| 009    | 0960_SW300  | Clear Plastic Bottle - Natural | 250 mL | 00070621172058 | Green | No       |        |
| 009    | 0960_SW300  | HDPE (no PTFE)                 | 20 mL  | 00352101058070 | Grey  | No       |        |



# CHAIN OF CUSTODY

COC#: 37751

ALS Laboratory: EP Perth

CLIENT: CARBSD - CARDNO (WA) PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: DEF19009/Learmonth SW - MGMB

ORDER NO: DEF19009/0960

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:

SAMPLER MOBILE:

/ ES2019CARBSD0002

## LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

|     |            |                                |        |                |       |    |  |
|-----|------------|--------------------------------|--------|----------------|-------|----|--|
| 009 | 0960_SW300 | HDPE (no PTFE)                 | 20 mL  | 00350621041477 | Grey  | No |  |
| 010 | 0960_SW211 | Clear Plastic Bottle - Natural | 250 mL | 00070621191219 | Green | No |  |
| 010 | 0960_SW211 | HDPE (no PTFE)                 | 20 mL  | 00352101070980 | Grey  | No |  |
| 010 | 0960_SW211 | HDPE (no PTFE)                 | 20 mL  | 00352101071957 | Grey  | No |  |
| 011 | 0960_SW210 | Clear Plastic Bottle - Natural | 250 mL | 00070621172062 | Green | No |  |
| 011 | 0960_SW210 | HDPE (no PTFE)                 | 20 mL  | 00352101057786 | Grey  | No |  |
| 011 | 0960_SW210 | HDPE (no PTFE)                 | 20 mL  | 00352101057965 | Grey  | No |  |
| 012 | 0960_SW209 | Clear Plastic Bottle - Natural | 250 mL | 00070621191267 | Green | No |  |
| 012 | 0960_SW209 | HDPE (no PTFE)                 | 20 mL  | 00352101071824 | Grey  | No |  |
| 012 | 0960_SW209 | HDPE (no PTFE)                 | 20 mL  | 00352101071752 | Grey  | No |  |
| 013 | 0960_SW302 | HDPE (no PTFE)                 | 20 mL  | 00352101070979 | Grey  | No |  |
| 013 | 0960_SW302 | HDPE (no PTFE)                 | 20 mL  | 00352101070976 | Grey  | No |  |
| 013 | 0960_SW302 | Clear Plastic Bottle - Natural | 250 mL | 00070621191228 | Green | No |  |
| 014 | 0960_SW207 | HDPE (no PTFE)                 | 20 mL  | 00352101071662 | Grey  | No |  |
| 014 | 0960_SW207 | HDPE (no PTFE)                 | 20 mL  | 00352101071619 | Grey  | No |  |
| 014 | 0960_SW207 | Clear Plastic Bottle - Natural | 250 mL | 00070621191243 | Green | No |  |
| 015 | 0960_QC301 | HDPE (no PTFE)                 | 20 mL  | 00350019165775 | Grey  | No |  |
| 015 | 0960_QC301 | HDPE (no PTFE)                 | 20 mL  | 00350019165886 | Grey  | No |  |
| 016 | 0960_QC401 | HDPE (no PTFE)                 | 20 mL  | 00350019008297 | Grey  | No |  |
| 016 | 0960_QC401 | HDPE (no PTFE)                 | 20 mL  | 00350019030670 | Grey  | No |  |

Total Bottle Count: ALS: 46, Non ALS: 0

# SAMPLE RECEIPT INFORMATION & BOTTLE TYPE

WORKORDER No:

To be completed by Sample Receipt

Sorting Times  
(Only record for BP, Mobil  
& URS)

Temperature Details

Packaging

Courier Details (Mandatory for Quarantine)

Sample  
Temp:

Security Seal  
Intact?

Packaging  
Type

No.

Carrier:

CIVIC DIRECT TOLL TNT

Time Sorting Commenced:

Time Placed in Fridge:

Chilling Method -

Circle below

☐ YES (Security seal  
Intact)

☐ NO (Security seal broken)

☒ NA (No security seal  
used)

Hard Esky

Foam Esky

Other:

CLIENT Other: \_\_\_\_\_

Con Note:

☒ Ice

☐ Ice Bricks

☐ No Chilling

Samples  
checked,  
labelled  
and put in  
trays by:

Initial:

Sorting to Fridge Target Time  
<1 Hour

Client:

Sample Receipt Advice Comments - To be completed by Sorting Staff

VOC analysis may be compromised as sample containers contained headspace (list / Details of any samples damaged during transit:

Other Information (eg. Were bottles received that weren't completely filled) (eg. If sample temperature is above 6°C add further detail here - Internal use only - Not for SRN):

## SAMPLE RECEIPT NOTIFICATION (SRN)

**Work Order : EP2205970**

|                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Client : <b>STANTEC AUSTRALIA PTY LTD</b></p> <p>Contact : [REDACTED]</p> <p>Address : GROUND FLOOR 226 ADELAIDE TERRACE<br/>PERTH 6000</p> <p>E-mail : [REDACTED]@cardno.com.au</p> <p>Telephone : ----</p> <p>Facsimile : ----</p> <p>Project : WA_0960_PFASOMP</p> <p>Order number : ----</p> <p>C-O-C number : 37751</p> <p>Site : DEF19009/Learmonth</p> <p>Sampler :</p> | <p>Laboratory : Environmental Division Perth</p> <p>Contact : Customer Services EP</p> <p>Address : 26 Rigali Way Wangara Western Australia 6065</p> <p>E-mail : ALSEnviro.Perth@alsglobal.com</p> <p>Telephone : +61-8-9406 1301</p> <p>Facsimile : +61-8-9406 1399</p> <p>Page : 1 of 3</p> <p>Quote number : ES2022MWAUS0002 (SY/139/19 B)</p> <p>QC Level : NEPM 2013 B3 &amp; ALS QC Standard</p> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Dates

|                                           |                                               |
|-------------------------------------------|-----------------------------------------------|
| Date Samples Received : 20-May-2022 11:30 | Issue Date : 25-May-2022                      |
| Client Requested Due Date : 01-Jun-2022   | Scheduled Reporting Date : <b>01-Jun-2022</b> |

### Delivery Details

|                            |                                              |
|----------------------------|----------------------------------------------|
| Mode of Delivery : Carrier | Security Seal : Not Available                |
| No. of coolers/boxes : 2   | Temperature : 21.5 - Ice present             |
| Receipt Detail :           | No. of samples received / analysed : 16 / 16 |

### General Comments

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



## Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exists.

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

| Laboratory sample ID | Sampling date / time | Sample ID         | WATER - EN055 - PG<br>Ionic Balance by ED037P, ED041G, ED045G &<br>WATER - EP231X<br>PFAS - Full Suite (28 analytes) | WATER - NT-01<br>Major Cations (Ca, Mg, Na, K) | WATER - NT-02<br>Major Anions (Chloride, Sulphate, Alkalinity) |
|----------------------|----------------------|-------------------|----------------------------------------------------------------------------------------------------------------------|------------------------------------------------|----------------------------------------------------------------|
| EP2205970-001        | 18-May-2022 08:07    | 0960_SW288_220518 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2205970-002        | 18-May-2022 08:20    | 0960_SW193_220518 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2205970-003        | 18-May-2022 08:21    | 0960_QC110_220518 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2205970-004        | 18-May-2022 08:29    | 0960_SW192_220518 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2205970-005        | 18-May-2022 08:43    | 0960_SW305_220518 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2205970-006        | 18-May-2022 09:03    | 0960_SW304_220518 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2205970-007        | 18-May-2022 09:05    | 0960_SW303_220518 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2205970-008        | 18-May-2022 09:17    | 0960_SW001_220518 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2205970-009        | 18-May-2022 09:28    | 0960_SW300_220518 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2205970-010        | 18-May-2022 09:42    | 0960_SW211_220518 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2205970-011        | 18-May-2022 09:59    | 0960_SW210_220518 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2205970-012        | 18-May-2022 10:11    | 0960_SW209_220518 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2205970-013        | 18-May-2022 10:18    | 0960_SW302_220518 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2205970-014        | 18-May-2022 10:30    | 0960_SW207_220518 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2205970-015        | 18-May-2022 11:43    | 0960_QC301_220518 |                                                                                                                      | ✓                                              |                                                                |
| EP2205970-016        | 18-May-2022 11:44    | 0960_QC401_220518 |                                                                                                                      | ✓                                              |                                                                |

## Proactive Holding Time Report

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



## CERTIFICATE OF ANALYSIS

**Work Order** : **EP2205970**  
**Client** : **STANTEC AUSTRALIA PTY LTD**  
**Contact** : [REDACTED]  
**Address** : GROUND FLOOR 226 ADELAIDE TERRACE  
 PERTH 6000  
**Telephone** : ----  
**Project** : WA\_0960\_PFASOMP  
**Order number** : ----  
**C-O-C number** : 37751  
**Sampler** : ----  
**Site** : DEF19009/Learmonth  
**Quote number** : SY/139/19 B  
**No. of samples received** : 16  
**No. of samples analysed** : 16

**Page** : 1 of 14  
**Laboratory** : Environmental Division Perth  
**Contact** : Customer Services EP  
**Address** : 26 Rigali Way Wangara Western Australia Australia 6065  
**Telephone** : +61-8-9406 1301  
**Date Samples Received** : 20-May-2022 11:30  
**Date Analysis Commenced** : 24-May-2022  
**Issue Date** : 01-Jun-2022 13:51



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>                |
|------------------------------------------------------------------------|----------------------------|----------------------------------------------|
| Canhuang Ke                                                            | Inorganics Supervisor      | Perth Inorganics, Wangara, Western Australia |
| <span style="background-color: black; color: black;">[REDACTED]</span> | Laboratory Manager (Perth) | Perth Inorganics, Wangara, Western Australia |
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator           | Sydney Organics, Smithfield, NSW             |





## 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.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- EP231X: Positive result for analyte Perfluorooctane sulfonic acid (PFOS) and on sample EP2205970\_001 has been confirmed by re-extraction and re-analysis.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.



## Analytical Results

Sub-Matrix: RINSATE  
 (Matrix: WATER)

Sample ID

|                                                |            |      |      | 0960_QC301_220518 | 0960_QC401_220518 | ----  | ----  | ----  |
|------------------------------------------------|------------|------|------|-------------------|-------------------|-------|-------|-------|
| Sampling date / time                           |            |      |      | 18-May-2022 11:43 | 18-May-2022 11:44 | ----  | ----  | ----  |
| Compound                                       | CAS Number | LOR  | Unit | EP2205970-015     | EP2205970-016     | ----- | ----- | ----- |
|                                                |            |      |      | Result            | Result            | ----  | ----  | ----  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>   |            |      |      |                   |                   |       |       |       |
| 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             | ----  | ----  | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b> |            |      |      |                   |                   |       |       |       |
| 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             | ----  | ----  | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>     |            |      |      |                   |                   |       |       |       |
| 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: RINSATE  
 (Matrix: WATER)

Sample ID

|                                                           |                    |      |      | 0960_QC301_220518 | 0960_QC401_220518 | ----  | ----  | ----  |
|-----------------------------------------------------------|--------------------|------|------|-------------------|-------------------|-------|-------|-------|
| Sampling date / time                                      |                    |      |      | 18-May-2022 11:43 | 18-May-2022 11:44 | ----  | ----  | ----  |
| Compound                                                  | CAS Number         | LOR  | Unit | EP2205970-015     | EP2205970-016     | ----- | ----- | ----- |
| Result                                                    |                    |      |      | Result            | Result            | ----  | ----  | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides - Continued</b>    |                    |      |      |                   |                   |       |       |       |
| 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             | ----  | ----  | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>         |                    |      |      |                   |                   |       |       |       |
| 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             | ----  | ----  | ----  |
| <b>EP231P: PFAS Sums</b>                                  |                    |      |      |                   |                   |       |       |       |
| 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             | ----  | ----  | ----  |
| <b>EP231S: PFAS Surrogate</b>                             |                    |      |      |                   |                   |       |       |       |
| 13C4-PFOS                                                 | ----               | 0.02 | %    | 99.1              | 106               | ----  | ----  | ----  |
| 13C8-PFOA                                                 | ----               | 0.02 | %    | 97.6              | 102               | ----  | ----  | ----  |



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                        |             |      |       | 0960_SW288_220518 | 0960_SW193_220518 | 0960_QC110_220518 | 0960_SW192_220518 | 0960_SW305_220518 |
|--------------------------------------------------------|-------------|------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                   |             |      |       | 18-May-2022 08:07 | 18-May-2022 08:20 | 18-May-2022 08:21 | 18-May-2022 08:29 | 18-May-2022 08:43 |
| Compound                                               | CAS Number  | LOR  | Unit  | EP2205970-001     | EP2205970-002     | EP2205970-003     | EP2205970-004     | EP2205970-005     |
|                                                        |             |      |       | Result            | Result            | Result            | Result            | Result            |
| <b>ED037P: Alkalinity by PC Titrator</b>               |             |      |       |                   |                   |                   |                   |                   |
| Hydroxide Alkalinity as CaCO3                          | DMO-210-001 | 1    | mg/L  | <1                | <1                | <1                | <1                | <1                |
| Carbonate Alkalinity as CaCO3                          | 3812-32-6   | 1    | mg/L  | <1                | <1                | <1                | <1                | <1                |
| Bicarbonate Alkalinity as CaCO3                        | 71-52-3     | 1    | mg/L  | 127               | 116               | 117               | 113               | 150               |
| Total Alkalinity as CaCO3                              | ----        | 1    | mg/L  | 127               | 116               | 117               | 113               | 150               |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b> |             |      |       |                   |                   |                   |                   |                   |
| Sulfate as SO4 - Turbidimetric                         | 14808-79-8  | 1    | mg/L  | 2680              | 2260              | 2230              | 1970              | 2720              |
| <b>ED045G: Chloride by Discrete Analyser</b>           |             |      |       |                   |                   |                   |                   |                   |
| Chloride                                               | 16887-00-6  | 1    | mg/L  | 19000             | 16200             | 16200             | 14700             | 19500             |
| <b>ED093F: Dissolved Major Cations</b>                 |             |      |       |                   |                   |                   |                   |                   |
| Calcium                                                | 7440-70-2   | 1    | mg/L  | 414               | 330               | 334               | 303               | 430               |
| Magnesium                                              | 7439-95-4   | 1    | mg/L  | 1350              | 1060              | 1060              | 953               | 1360              |
| Sodium                                                 | 7440-23-5   | 1    | mg/L  | 9990              | 7630              | 7610              | 6800              | 9920              |
| Potassium                                              | 7440-09-7   | 1    | mg/L  | 524               | 404               | 402               | 359               | 506               |
| <b>EN055: Ionic Balance</b>                            |             |      |       |                   |                   |                   |                   |                   |
| ∅ Total Anions                                         | ----        | 0.01 | meq/L | 594               | 506               | 506               | 458               | 610               |
| ∅ Total Cations                                        | ----        | 0.01 | meq/L | 580               | 446               | 445               | 398               | 578               |
| ∅ Ionic Balance                                        | ----        | 0.01 | %     | 1.24              | 6.34              | 6.37              | 6.94              | 2.68              |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>           |             |      |       |                   |                   |                   |                   |                   |
| Perfluorobutane sulfonic acid (PFBS)                   | 375-73-5    | 0.02 | µg/L  | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| Perfluoropentane sulfonic acid (PFPeS)                 | 2706-91-4   | 0.02 | µg/L  | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| Perfluorohexane sulfonic acid (PFHxS)                  | 355-46-4    | 0.01 | µg/L  | <0.01             | <0.01             | <0.01             | <0.01             | <0.01             |
| Perfluoroheptane sulfonic acid (PFHpS)                 | 375-92-8    | 0.02 | µg/L  | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| Perfluorooctane sulfonic acid (PFOS)                   | 1763-23-1   | 0.01 | µg/L  | 0.02              | 0.08              | 0.09              | 0.07              | <0.01             |
| Perfluorodecane sulfonic acid (PFDS)                   | 335-77-3    | 0.02 | µg/L  | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>         |             |      |       |                   |                   |                   |                   |                   |
| 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             |



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_SW288_220518 | 0960_SW193_220518 | 0960_QC110_220518 | 0960_SW192_220518 | 0960_SW305_220518 |
|------------------------------------------------------------|-------------|------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                       |             |      |      | 18-May-2022 08:07 | 18-May-2022 08:20 | 18-May-2022 08:21 | 18-May-2022 08:29 | 18-May-2022 08:43 |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2205970-001     | EP2205970-002     | EP2205970-003     | EP2205970-004     | EP2205970-005     |
|                                                            |             |      |      | Result            | Result            | Result            | Result            | Result            |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                   |                   |                   |                   |                   |
| 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             |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                   |                   |                   |                   |                   |
| Perfluorooctane sulfonamide (FOSA)                         | 754-91-6    | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)              | 31506-32-8  | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)               | 4151-50-2   | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)       | 24448-09-7  | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)        | 1691-99-2   | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)  | 2355-31-9   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)   | 2991-50-6   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                   |                   |                   |                   |                   |
| 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             |



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_SW288_220518 | 0960_SW193_220518 | 0960_QC110_220518 | 0960_SW192_220518 | 0960_SW305_220518 |
|---------------------------------------------------------------|--------------------|------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                          |                    |      |      | 18-May-2022 08:07 | 18-May-2022 08:20 | 18-May-2022 08:21 | 18-May-2022 08:29 | 18-May-2022 08:43 |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2205970-001     | EP2205970-002     | EP2205970-003     | EP2205970-004     | EP2205970-005     |
|                                                               |                    |      |      | Result            | Result            | Result            | Result            | Result            |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                   |                   |                   |                   |                   |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                   |                   |                   |                   |                   |
| Sum of PFAS                                                   | ----               | 0.01 | µg/L | 0.02              | 0.08              | 0.09              | 0.07              | <0.01             |
| Sum of PFHxS and PFOS                                         | 355-46-4/1763-23-1 | 0.01 | µg/L | 0.02              | 0.08              | 0.09              | 0.07              | <0.01             |
| Sum of PFAS (WA DER List)                                     | ----               | 0.01 | µg/L | 0.02              | 0.08              | 0.09              | 0.07              | <0.01             |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 94.7              | 94.6              | 100               | 95.3              | 101               |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 96.4              | 97.9              | 102               | 99.1              | 102               |



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                        |             |      |       | 0960_SW304_220518 | 0960_SW303_220518 | 0960_SW001_220518 | 0960_SW300_220518 | 0960_SW211_220518 |
|--------------------------------------------------------|-------------|------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                   |             |      |       | 18-May-2022 09:03 | 18-May-2022 09:05 | 18-May-2022 09:17 | 18-May-2022 09:28 | 18-May-2022 09:42 |
| Compound                                               | CAS Number  | LOR  | Unit  | EP2205970-006     | EP2205970-007     | EP2205970-008     | EP2205970-009     | EP2205970-010     |
|                                                        |             |      |       | Result            | Result            | Result            | Result            | Result            |
| <b>ED037P: Alkalinity by PC Titrator</b>               |             |      |       |                   |                   |                   |                   |                   |
| Hydroxide Alkalinity as CaCO3                          | DMO-210-001 | 1    | mg/L  | <1                | <1                | <1                | <1                | <1                |
| Carbonate Alkalinity as CaCO3                          | 3812-32-6   | 1    | mg/L  | <1                | <1                | <1                | <1                | <1                |
| Bicarbonate Alkalinity as CaCO3                        | 71-52-3     | 1    | mg/L  | 150               | 157               | 186               | 211               | 230               |
| Total Alkalinity as CaCO3                              | ----        | 1    | mg/L  | 150               | 157               | 186               | 211               | 230               |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b> |             |      |       |                   |                   |                   |                   |                   |
| Sulfate as SO4 - Turbidimetric                         | 14808-79-8  | 1    | mg/L  | 2730              | 2700              | 2950              | 3000              | 2790              |
| <b>ED045G: Chloride by Discrete Analyser</b>           |             |      |       |                   |                   |                   |                   |                   |
| Chloride                                               | 16887-00-6  | 1    | mg/L  | 19800             | 20000             | 21400             | 20500             | 19500             |
| <b>ED093F: Dissolved Major Cations</b>                 |             |      |       |                   |                   |                   |                   |                   |
| Calcium                                                | 7440-70-2   | 1    | mg/L  | 414               | 420               | 460               | 499               | 448               |
| Magnesium                                              | 7439-95-4   | 1    | mg/L  | 1310              | 1330              | 1500              | 1450              | 1330              |
| Sodium                                                 | 7440-23-5   | 1    | mg/L  | 9580              | 9660              | 10800             | 10600             | 9720              |
| Potassium                                              | 7440-09-7   | 1    | mg/L  | 490               | 494               | 549               | 539               | 503               |
| <b>EN055: Ionic Balance</b>                            |             |      |       |                   |                   |                   |                   |                   |
| ∅ Total Anions                                         | ----        | 0.01 | meq/L | 618               | 624               | 669               | 645               | 613               |
| ∅ Total Cations                                        | ----        | 0.01 | meq/L | 558               | 563               | 630               | 619               | 567               |
| ∅ Ionic Balance                                        | ----        | 0.01 | %     | 5.16              | 5.08              | 2.97              | 2.04              | 3.84              |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>           |             |      |       |                   |                   |                   |                   |                   |
| 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             |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>         |             |      |       |                   |                   |                   |                   |                   |
| 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             |





## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_SW304_220518 | 0960_SW303_220518 | 0960_SW001_220518 | 0960_SW300_220518 | 0960_SW211_220518 |
|------------------------------------------------------------|-------------|------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                       |             |      |      | 18-May-2022 09:03 | 18-May-2022 09:05 | 18-May-2022 09:17 | 18-May-2022 09:28 | 18-May-2022 09:42 |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2205970-006     | EP2205970-007     | EP2205970-008     | EP2205970-009     | EP2205970-010     |
|                                                            |             |      |      | Result            | Result            | Result            | Result            | Result            |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                   |                   |                   |                   |                   |
| 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             |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                   |                   |                   |                   |                   |
| Perfluorooctane sulfonamide (FOSA)                         | 754-91-6    | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)              | 31506-32-8  | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)               | 4151-50-2   | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)       | 24448-09-7  | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)        | 1691-99-2   | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)  | 2355-31-9   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)   | 2991-50-6   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                   |                   |                   |                   |                   |
| 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             |



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_SW304_220518 | 0960_SW303_220518 | 0960_SW001_220518 | 0960_SW300_220518 | 0960_SW211_220518 |
|---------------------------------------------------------------|--------------------|------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                          |                    |      |      | 18-May-2022 09:03 | 18-May-2022 09:05 | 18-May-2022 09:17 | 18-May-2022 09:28 | 18-May-2022 09:42 |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2205970-006     | EP2205970-007     | EP2205970-008     | EP2205970-009     | EP2205970-010     |
|                                                               |                    |      |      | Result            | Result            | Result            | Result            | Result            |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                   |                   |                   |                   |                   |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                   |                   |                   |                   |                   |
| 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             |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 93.7              | 95.2              | 104               | 98.5              | 95.0              |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 96.1              | 95.1              | 104               | 96.3              | 100               |



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                        |             |      |       | 0960_SW210_220518 | 0960_SW209_220518 | 0960_SW302_220518 | 0960_SW207_220518 | ----  |
|--------------------------------------------------------|-------------|------|-------|-------------------|-------------------|-------------------|-------------------|-------|
| Sampling date / time                                   |             |      |       | 18-May-2022 09:59 | 18-May-2022 10:11 | 18-May-2022 10:18 | 18-May-2022 10:30 | ----  |
| Compound                                               | CAS Number  | LOR  | Unit  | EP2205970-011     | EP2205970-012     | EP2205970-013     | EP2205970-014     | ----- |
|                                                        |             |      |       | Result            | Result            | Result            | Result            | ----  |
| <b>ED037P: Alkalinity by PC Titrator</b>               |             |      |       |                   |                   |                   |                   |       |
| Hydroxide Alkalinity as CaCO3                          | DMO-210-001 | 1    | mg/L  | <1                | <1                | <1                | <1                | ----  |
| Carbonate Alkalinity as CaCO3                          | 3812-32-6   | 1    | mg/L  | <1                | <1                | <1                | <1                | ----  |
| Bicarbonate Alkalinity as CaCO3                        | 71-52-3     | 1    | mg/L  | 188               | 154               | 159               | 111               | ----  |
| Total Alkalinity as CaCO3                              | ----        | 1    | mg/L  | 188               | 154               | 159               | 111               | ----  |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b> |             |      |       |                   |                   |                   |                   |       |
| Sulfate as SO4 - Turbidimetric                         | 14808-79-8  | 1    | mg/L  | 2810              | 2760              | 2750              | 2670              | ----  |
| <b>ED045G: Chloride by Discrete Analyser</b>           |             |      |       |                   |                   |                   |                   |       |
| Chloride                                               | 16887-00-6  | 1    | mg/L  | 19400             | 19800             | 20000             | 19800             | ----  |
| <b>ED093F: Dissolved Major Cations</b>                 |             |      |       |                   |                   |                   |                   |       |
| Calcium                                                | 7440-70-2   | 1    | mg/L  | 467               | 442               | 409               | 408               | ----  |
| Magnesium                                              | 7439-95-4   | 1    | mg/L  | 1420              | 1400              | 1280              | 1300              | ----  |
| Sodium                                                 | 7440-23-5   | 1    | mg/L  | 10500             | 10300             | 9350              | 9530              | ----  |
| Potassium                                              | 7440-09-7   | 1    | mg/L  | 543               | 531               | 479               | 488               | ----  |
| <b>EN055: Ionic Balance</b>                            |             |      |       |                   |                   |                   |                   |       |
| ∅ Total Anions                                         | ----        | 0.01 | meq/L | 610               | 619               | 625               | 616               | ----  |
| ∅ Total Cations                                        | ----        | 0.01 | meq/L | 611               | 599               | 545               | 554               | ----  |
| ∅ Ionic Balance                                        | ----        | 0.01 | %     | 0.10              | 1.66              | 6.83              | 5.29              | ----  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>           |             |      |       |                   |                   |                   |                   |       |
| Perfluorobutane sulfonic acid (PFBS)                   | 375-73-5    | 0.02 | µg/L  | <0.02             | <0.02             | <0.02             | <0.02             | ----  |
| Perfluoropentane sulfonic acid (PFPeS)                 | 2706-91-4   | 0.02 | µg/L  | <0.02             | <0.02             | <0.02             | <0.02             | ----  |
| Perfluorohexane sulfonic acid (PFHxS)                  | 355-46-4    | 0.01 | µg/L  | <0.01             | <0.01             | <0.01             | <0.01             | ----  |
| Perfluoroheptane sulfonic acid (PFHpS)                 | 375-92-8    | 0.02 | µg/L  | <0.02             | <0.02             | <0.02             | <0.02             | ----  |
| Perfluorooctane sulfonic acid (PFOS)                   | 1763-23-1   | 0.01 | µg/L  | <0.01             | <0.01             | <0.01             | <0.01             | ----  |
| Perfluorodecane sulfonic acid (PFDS)                   | 335-77-3    | 0.02 | µg/L  | <0.02             | <0.02             | <0.02             | <0.02             | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>         |             |      |       |                   |                   |                   |                   |       |
| 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             | ----  |



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_SW210_220518 | 0960_SW209_220518 | 0960_SW302_220518 | 0960_SW207_220518 | ----  |
|------------------------------------------------------------|-------------|------|------|-------------------|-------------------|-------------------|-------------------|-------|
| Sampling date / time                                       |             |      |      | 18-May-2022 09:59 | 18-May-2022 10:11 | 18-May-2022 10:18 | 18-May-2022 10:30 | ----  |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2205970-011     | EP2205970-012     | EP2205970-013     | EP2205970-014     | ----- |
|                                                            |             |      |      | Result            | Result            | Result            | Result            | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                   |                   |                   |                   |       |
| 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             | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                   |                   |                   |                   |       |
| 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             | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                   |                   |                   |                   |       |
| 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             | ----  |



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_SW210_220518 | 0960_SW209_220518 | 0960_SW302_220518 | 0960_SW207_220518 | ----  |
|---------------------------------------------------------------|--------------------|------|------|-------------------|-------------------|-------------------|-------------------|-------|
| Sampling date / time                                          |                    |      |      | 18-May-2022 09:59 | 18-May-2022 10:11 | 18-May-2022 10:18 | 18-May-2022 10:30 | ----  |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2205970-011     | EP2205970-012     | EP2205970-013     | EP2205970-014     | ----- |
|                                                               |                    |      |      | Result            | Result            | Result            | Result            | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                   |                   |                   |                   |       |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | ----  |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                   |                   |                   |                   |       |
| Sum of PFAS                                                   | ----               | 0.01 | µg/L | <0.01             | <0.01             | <0.01             | <0.01             | ----  |
| Sum of PFHxS and PFOS                                         | 355-46-4/1763-23-1 | 0.01 | µg/L | <0.01             | <0.01             | <0.01             | <0.01             | ----  |
| Sum of PFAS (WA DER List)                                     | ----               | 0.01 | µg/L | <0.01             | <0.01             | <0.01             | <0.01             | ----  |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                   |                   |                   |                   |       |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 101               | 95.4              | 97.1              | 98.5              | ----  |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 102               | 96.3              | 105               | 96.4              | ----  |



## Surrogate Control Limits

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

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

## Inter-Laboratory Testing

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

## QUALITY CONTROL REPORT

|                                |                                                           |                                |                                                                 |
|--------------------------------|-----------------------------------------------------------|--------------------------------|-----------------------------------------------------------------|
| <b>Work Order</b>              | <b>: EP2205970</b>                                        | <b>Page</b>                    | <b>: 1 of 6</b>                                                 |
| <b>Client</b>                  | <b>: STANTEC AUSTRALIA PTY LTD</b>                        | <b>Laboratory</b>              | <b>: Environmental Division Perth</b>                           |
| <b>Contact</b>                 | <b>: [REDACTED]</b>                                       | <b>Contact</b>                 | <b>: Customer Services EP</b>                                   |
| <b>Address</b>                 | <b>: GROUND FLOOR 226 ADELAIDE TERRACE<br/>PERTH 6000</b> | <b>Address</b>                 | <b>: 26 Rigali Way Wangara Western Australia Australia 6065</b> |
| <b>Telephone</b>               | <b>: ----</b>                                             | <b>Telephone</b>               | <b>: +61-8-9406 1301</b>                                        |
| <b>Project</b>                 | <b>: WA_0960_PFASOMP</b>                                  | <b>Date Samples Received</b>   | <b>: 20-May-2022</b>                                            |
| <b>Order number</b>            | <b>: ----</b>                                             | <b>Date Analysis Commenced</b> | <b>: 24-May-2022</b>                                            |
| <b>C-O-C number</b>            | <b>: 37751</b>                                            | <b>Issue Date</b>              | <b>: 01-Jun-2022</b>                                            |
| <b>Sampler</b>                 | <b>: ----</b>                                             |                                |                                                                 |
| <b>Site</b>                    | <b>: DEF19009/Learmonth</b>                               |                                |                                                                 |
| <b>Quote number</b>            | <b>: SY/139/19 B</b>                                      |                                |                                                                 |
| <b>No. of samples received</b> | <b>: 16</b>                                               |                                |                                                                 |
| <b>No. of samples analysed</b> | <b>: 16</b>                                               |                                |                                                                 |



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>                |
|--------------------|----------------------------|----------------------------------------------|
| Canhuang Ke        | Inorganics Supervisor      | Perth Inorganics, Wangara, Western Australia |
| [REDACTED]         | Laboratory Manager (Perth) | Perth Inorganics, Wangara, Western Australia |
| [REDACTED]         | LCMS Coordinator           | Sydney Organics, Smithfield, NSW             |





## 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**

| Sub-Matrix: WATER                                                 |                   |                                          |             | Laboratory Duplicate (DUP) Report |      |                 |                  |         |                    |
|-------------------------------------------------------------------|-------------------|------------------------------------------|-------------|-----------------------------------|------|-----------------|------------------|---------|--------------------|
| Laboratory sample ID                                              | Sample ID         | Method: Compound                         | CAS Number  | LOR                               | Unit | Original Result | Duplicate Result | RPD (%) | Acceptable RPD (%) |
| ED037P: Alkalinity by PC Titrator (QC Lot: 4370994)               |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2205970-001                                                     | 0960_SW288_220518 | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 127             | 126              | 0.0     | 0% - 20%           |
|                                                                   |                   | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 127             | 126              | 0.0     | 0% - 20%           |
| EP2206220-003                                                     | Anonymous         | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 22              | 22               | 0.0     | 0% - 20%           |
|                                                                   |                   | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 22              | 22               | 0.0     | 0% - 20%           |
| ED037P: Alkalinity by PC Titrator (QC Lot: 4371277)               |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2206192-005                                                     | Anonymous         | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 194             | 194              | 0.0     | 0% - 20%           |
|                                                                   |                   | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 194             | 194              | 0.0     | 0% - 20%           |
| EP2206185-001                                                     | Anonymous         | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 94              | 94               | 0.0     | 0% - 20%           |
|                                                                   |                   | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 94              | 94               | 0.0     | 0% - 20%           |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4355316) |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2205970-001                                                     | 0960_SW288_220518 | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 2680            | 2700             | 0.7     | 0% - 20%           |
| EP2205970-011                                                     | 0960_SW210_220518 | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 2810            | 2810             | 0.2     | 0% - 20%           |
| ED045G: Chloride by Discrete Analyser (QC Lot: 4355315)           |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2205970-001                                                     | 0960_SW288_220518 | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 19000           | 19100            | 0.8     | 0% - 20%           |
| EP2205970-011                                                     | 0960_SW210_220518 | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 19400           | 19200            | 1.1     | 0% - 20%           |

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 Work Order : EP2205970  
 Client : STANTEC AUSTRALIA PTY LTD  
 Project : WA\_0960\_PFASOMP



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 (%) |
| ED093F: Dissolved Major Cations (QC Lot: 4355480) |                   |                   |            |                                   |      |                 |                  |         |                    |
| EP2205925-001                                     | Anonymous         | ED093F: Calcium   | 7440-70-2  | 1                                 | mg/L | 64              | 60               | 7.1     | 0% - 20%           |
|                                                   |                   | ED093F: Magnesium | 7439-95-4  | 1                                 | mg/L | 105             | 97               | 7.6     | 0% - 20%           |
|                                                   |                   | ED093F: Sodium    | 7440-23-5  | 1                                 | mg/L | 982             | 904              | 8.3     | 0% - 20%           |
|                                                   |                   | ED093F: Potassium | 7440-09-7  | 1                                 | mg/L | 61              | 56               | 9.6     | 0% - 20%           |
| EP2205925-011                                     | Anonymous         | ED093F: Calcium   | 7440-70-2  | 1                                 | mg/L | 438             | 431              | 1.6     | 0% - 20%           |
|                                                   |                   | ED093F: Magnesium | 7439-95-4  | 1                                 | mg/L | 1420            | 1410             | 0.7     | 0% - 20%           |
|                                                   |                   | ED093F: Sodium    | 7440-23-5  | 1                                 | mg/L | 10600           | 10500            | 0.5     | 0% - 20%           |
|                                                   |                   | ED093F: Potassium | 7440-09-7  | 1                                 | mg/L | 555             | 559              | 0.8     | 0% - 20%           |
| ED093F: Dissolved Major Cations (QC Lot: 4355481) |                   |                   |            |                                   |      |                 |                  |         |                    |
| EP2205970-009                                     | 0960_SW300_220518 | ED093F: Calcium   | 7440-70-2  | 1                                 | mg/L | 499             | 500              | 0.0     | 0% - 20%           |
|                                                   |                   | ED093F: Magnesium | 7439-95-4  | 1                                 | mg/L | 1450            | 1450             | 0.1     | 0% - 20%           |
|                                                   |                   | ED093F: Sodium    | 7440-23-5  | 1                                 | mg/L | 10600           | 10600            | 0.7     | 0% - 20%           |
|                                                   |                   | ED093F: Potassium | 7440-09-7  | 1                                 | mg/L | 539             | 544              | 0.9     | 0% - 20%           |
| EP2206124-030                                     | Anonymous         | ED093F: Calcium   | 7440-70-2  | 1                                 | mg/L | 1340            | 1360             | 1.3     | 0% - 20%           |
|                                                   |                   | ED093F: Magnesium | 7439-95-4  | 1                                 | mg/L | 1860            | 1890             | 1.3     | 0% - 20%           |
|                                                   |                   | ED093F: Sodium    | 7440-23-5  | 1                                 | mg/L | 10200           | 10300            | 1.3     | 0% - 20%           |
|                                                   |                   | ED093F: Potassium | 7440-09-7  | 1                                 | mg/L | 268             | 269              | 0.0     | 0% - 20%           |



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

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

Sub-Matrix: **WATER**

| Method: Compound CAS Number LOR Unit                                               |             |      |      | Method Blank (MB) Report Result | Laboratory Control Spike (LCS) Report |                        |                       |      |
|------------------------------------------------------------------------------------|-------------|------|------|---------------------------------|---------------------------------------|------------------------|-----------------------|------|
|                                                                                    |             |      |      |                                 | Spike Concentration                   | Spike Recovery (%) LCS | Acceptable Limits (%) |      |
|                                                                                    |             |      |      |                                 |                                       |                        | Low                   | High |
| <b>ED037P: Alkalinity by PC Titrator (QCLot: 4370994)</b>                          |             |      |      |                                 |                                       |                        |                       |      |
| ED037-P: Hydroxide Alkalinity as CaCO <sub>3</sub>                                 | DMO-210-001 | 1    | mg/L | <1                              | ----                                  | ----                   | ----                  | ---- |
| ED037-P: Carbonate Alkalinity as CaCO <sub>3</sub>                                 | 3812-32-6   | 1    | mg/L | <1                              | ----                                  | ----                   | ----                  | ---- |
| ED037-P: Bicarbonate Alkalinity as CaCO <sub>3</sub>                               | 71-52-3     | 1    | mg/L | <1                              | ----                                  | ----                   | ----                  | ---- |
| ED037-P: Total Alkalinity as CaCO <sub>3</sub>                                     | ----        | 1    | mg/L | <1                              | 20 mg/L                               | 109                    | 81.2                  | 126  |
|                                                                                    |             |      |      | <1                              | 200 mg/L                              | 97.2                   | 90.0                  | 110  |
| <b>ED037P: Alkalinity by PC Titrator (QCLot: 4371277)</b>                          |             |      |      |                                 |                                       |                        |                       |      |
| ED037-P: Hydroxide Alkalinity as CaCO <sub>3</sub>                                 | DMO-210-001 | 1    | mg/L | <1                              | ----                                  | ----                   | ----                  | ---- |
| ED037-P: Carbonate Alkalinity as CaCO <sub>3</sub>                                 | 3812-32-6   | 1    | mg/L | <1                              | ----                                  | ----                   | ----                  | ---- |
| ED037-P: Bicarbonate Alkalinity as CaCO <sub>3</sub>                               | 71-52-3     | 1    | mg/L | <1                              | ----                                  | ----                   | ----                  | ---- |
| ED037-P: Total Alkalinity as CaCO <sub>3</sub>                                     | ----        | 1    | mg/L | <1                              | 20 mg/L                               | 107                    | 81.2                  | 126  |
|                                                                                    |             |      |      | <1                              | 200 mg/L                              | 98.7                   | 90.0                  | 110  |
| <b>ED041G: Sulfate (Turbidimetric) as SO<sub>4</sub> 2- by DA (QCLot: 4355316)</b> |             |      |      |                                 |                                       |                        |                       |      |
| ED041G: Sulfate as SO <sub>4</sub> - Turbidimetric                                 | 14808-79-8  | 1    | mg/L | <1                              | 25 mg/L                               | 100                    | 87.7                  | 113  |
|                                                                                    |             |      |      | <1                              | 500 mg/L                              | 98.7                   | 87.7                  | 113  |
| <b>ED045G: Chloride by Discrete Analyser (QCLot: 4355315)</b>                      |             |      |      |                                 |                                       |                        |                       |      |
| ED045G: Chloride                                                                   | 16887-00-6  | 1    | mg/L | <1                              | 10 mg/L                               | 103                    | 87.9                  | 114  |
|                                                                                    |             |      |      | <1                              | 1000 mg/L                             | 106                    | 87.9                  | 114  |
| <b>ED093F: Dissolved Major Cations (QCLot: 4355480)</b>                            |             |      |      |                                 |                                       |                        |                       |      |
| ED093F: Calcium                                                                    | 7440-70-2   | 1    | mg/L | <1                              | 50 mg/L                               | 99.3                   | 85.9                  | 113  |
| ED093F: Magnesium                                                                  | 7439-95-4   | 1    | mg/L | <1                              | 50 mg/L                               | 102                    | 88.0                  | 110  |
| ED093F: Sodium                                                                     | 7440-23-5   | 1    | mg/L | <1                              | 50 mg/L                               | 106                    | 87.3                  | 118  |
| ED093F: Potassium                                                                  | 7440-09-7   | 1    | mg/L | <1                              | 50 mg/L                               | 95.7                   | 89.7                  | 108  |
| <b>ED093F: Dissolved Major Cations (QCLot: 4355481)</b>                            |             |      |      |                                 |                                       |                        |                       |      |
| ED093F: Calcium                                                                    | 7440-70-2   | 1    | mg/L | <1                              | 50 mg/L                               | 97.0                   | 85.9                  | 113  |
| ED093F: Magnesium                                                                  | 7439-95-4   | 1    | mg/L | <1                              | 50 mg/L                               | 97.8                   | 88.0                  | 110  |
| ED093F: Sodium                                                                     | 7440-23-5   | 1    | mg/L | <1                              | 50 mg/L                               | 104                    | 87.3                  | 118  |
| ED093F: Potassium                                                                  | 7440-09-7   | 1    | mg/L | <1                              | 50 mg/L                               | 91.5                   | 89.7                  | 108  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4363076)</b>                      |             |      |      |                                 |                                       |                        |                       |      |
| EP231X: Perfluorobutane sulfonic acid (PFBS)                                       | 375-73-5    | 0.02 | µg/L | <0.02                           | 0.25 µg/L                             | 114                    | 72.0                  | 130  |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)                                     | 2706-91-4   | 0.02 | µg/L | <0.02                           | 0.25 µg/L                             | 113                    | 71.0                  | 127  |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)                                      | 355-46-4    | 0.01 | µg/L | <0.01                           | 0.25 µg/L                             | 112                    | 68.0                  | 131  |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)                                     | 375-92-8    | 0.02 | µg/L | <0.02                           | 0.25 µg/L                             | 120                    | 69.0                  | 134  |



Sub-Matrix: **WATER**

| Sub-Matrix: WATER                                                  |             |      |      | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |     |
|--------------------------------------------------------------------|-------------|------|------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|-----|
|                                                                    |             |      |      |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |     |
| Method: Compound                                                   | CAS Number  | LOR  | Unit | Result                      |                                       |                           |                                   |     |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4363076) - continued |             |      |      |                             |                                       |                           |                                   |     |
| EP231X: Perfluorooctane sulfonic acid (PFOS)                       | 1763-23-1   | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 113                       | 65.0                              | 140 |
| EP231X: Perfluorodecane sulfonic acid (PFDS)                       | 335-77-3    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 114                       | 53.0                              | 142 |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4363076)           |             |      |      |                             |                                       |                           |                                   |     |
| EP231X: Perfluorobutanoic acid (PFBA)                              | 375-22-4    | 0.1  | µg/L | <0.1                        | 1.25 µg/L                             | 104                       | 73.0                              | 129 |
| EP231X: Perfluoropentanoic acid (PFPeA)                            | 2706-90-3   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 118                       | 72.0                              | 129 |
| EP231X: Perfluorohexanoic acid (PFHxA)                             | 307-24-4    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 119                       | 72.0                              | 129 |
| EP231X: Perfluoroheptanoic acid (PFHpA)                            | 375-85-9    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 123                       | 72.0                              | 130 |
| EP231X: Perfluorooctanoic acid (PFOA)                              | 335-67-1    | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 123                       | 71.0                              | 133 |
| EP231X: Perfluorononanoic acid (PFNA)                              | 375-95-1    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 125                       | 69.0                              | 130 |
| EP231X: Perfluorodecanoic acid (PFDA)                              | 335-76-2    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 111                       | 71.0                              | 129 |
| EP231X: Perfluoroundecanoic acid (PFUnDA)                          | 2058-94-8   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 131                       | 69.0                              | 133 |
| EP231X: Perfluorododecanoic acid (PFDoDA)                          | 307-55-1    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 134                       | 72.0                              | 134 |
| EP231X: Perfluorotridecanoic acid (PFTrDA)                         | 72629-94-8  | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 138                       | 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: 4363076)               |             |      |      |                             |                                       |                           |                                   |     |
| EP231X: Perfluorooctane sulfonamide (FOSA)                         | 754-91-6    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 124                       | 67.0                              | 137 |
| EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)              | 31506-32-8  | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 96.7                      | 68.0                              | 141 |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)               | 4151-50-2   | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 103                       | 62.6                              | 147 |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)       | 24448-09-7  | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 115                       | 66.0                              | 145 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)        | 1691-99-2   | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 110                       | 57.6                              | 145 |
| EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)  | 2355-31-9   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 121                       | 65.0                              | 136 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)   | 2991-50-6   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 123                       | 61.0                              | 135 |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4363076)        |             |      |      |                             |                                       |                           |                                   |     |
| EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                  | 757124-72-4 | 0.05 | µg/L | <0.05                       | 0.25 µg/L                             | 128                       | 63.0                              | 143 |
| EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                  | 27619-97-2  | 0.05 | µg/L | <0.05                       | 0.25 µg/L                             | 104                       | 64.0                              | 140 |
| EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                  | 39108-34-4  | 0.05 | µg/L | <0.05                       | 0.25 µg/L                             | 97.8                      | 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                             | 135                       | 71.4                              | 144 |

## Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

|                      |           |                  |            | Matrix Spike (MS) Report |                  |                       |      |
|----------------------|-----------|------------------|------------|--------------------------|------------------|-----------------------|------|
|                      |           |                  |            | Spike                    | SpikeRecovery(%) | Acceptable Limits (%) |      |
| Laboratory sample ID | Sample ID | Method: Compound | CAS Number | Concentration            | MS               | Low                   | High |



Sub-Matrix: WATER

|                                                                  |                   |                                        |            | Matrix Spike (MS) Report |                  |                       |      |
|------------------------------------------------------------------|-------------------|----------------------------------------|------------|--------------------------|------------------|-----------------------|------|
|                                                                  |                   |                                        |            | Spike                    | SpikeRecovery(%) | Acceptable Limits (%) |      |
| Laboratory sample ID                                             | Sample ID         | Method: Compound                       | CAS Number | Concentration            | MS               | Low                   | High |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4355316) |                   |                                        |            |                          |                  |                       |      |
| EP2205970-001                                                    | 0960_SW288_220518 | ED041G: Sulfate as SO4 - Turbidimetric | 14808-79-8 | 100 mg/L                 | # Not Determined | 70.0                  | 130  |
| ED045G: Chloride by Discrete Analyser (QCLot: 4355315)           |                   |                                        |            |                          |                  |                       |      |
| EP2205970-001                                                    | 0960_SW288_220518 | ED045G: Chloride                       | 16887-00-6 | 1000 mg/L                | # Not Determined | 70.0                  | 130  |

## QA/QC Compliance Assessment to assist with Quality Review

Work Order : EP2205970

Page : 1 of 6

Client : STANTEC AUSTRALIA PTY LTD  
Contact :   
Project : WA\_0960\_PFASOMP  
Site : DEF19009/Learmonth  
Sampler : ----  
Order number : ----

Laboratory : Environmental Division Perth  
Telephone : +61-8-9406 1301  
Date Samples Received : 20-May-2022  
Issue Date : 01-Jun-2022  
No. of samples received : 16  
No. of samples analysed : 16

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

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

### Summary of Outliers

#### Outliers : Quality Control Samples

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

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

Page : 2 of 6  
 Work Order : EP2205970  
 Client : STANTEC AUSTRALIA PTY LTD  
 Project : WA\_0960\_PFASOMP



### 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                                                                               |
|-------------------------------------------------------------|----------------------|-------------------|--------------------------------------------|------------|----------------|--------|---------------------------------------------------------------------------------------|
| <b>Matrix Spike (MS) Recoveries</b>                         |                      |                   |                                            |            |                |        |                                                                                       |
| ED041G: Sulfate (Turbidimetric) as SO <sub>4</sub> 2- by DA | EP2205970--001       | 0960_SW288_220518 | Sulfate as SO <sub>4</sub> - Turbidimetric | 14808-79-8 | Not Determined | ----   | MS recovery not determined, background level greater than or equal to 4x spike level. |
| ED045G: Chloride by Discrete Analyser                       | EP2205970--001       | 0960_SW288_220518 | Chloride                                   | 16887-00-6 | Not Determined | ----   | MS recovery not determined, background level greater than or equal to 4x spike level. |

### Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

| Quality Control Sample Type                          | Count |         | Rate (%) |          | Quality Control Specification  |
|------------------------------------------------------|-------|---------|----------|----------|--------------------------------|
| Method                                               | QC    | Regular | Actual   | Expected |                                |
| <b>Laboratory Duplicates (DUP)</b>                   |       |         |          |          |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | 0     | 20      | 0.00     | 10.00    | NEPM 2013 B3 & ALS QC Standard |
| <b>Matrix Spikes (MS)</b>                            |       |         |          |          |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | 0     | 20      | 0.00     | 5.00     | NEPM 2013 B3 & ALS QC Standard |

## Analysis Holding Time Compliance

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

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

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

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

Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                   | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |
|------------------------------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|
| Container / Client Sample ID(s)          |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| ED037P: Alkalinity by PC Titrator        |             |                          |                    |            |               |                  |            |
| Clear Plastic Bottle - Natural (ED037-P) | 18-May-2022 | ----                     | ----               | ----       | 31-May-2022   | 01-Jun-2022      | ✔          |
| 0960_SW288_220518, 0960_SW193_220518,    |             |                          |                    |            |               |                  |            |
| 0960_QC110_220518, 0960_SW192_220518,    |             |                          |                    |            |               |                  |            |
| 0960_SW305_220518, 0960_SW304_220518,    |             |                          |                    |            |               |                  |            |
| 0960_SW303_220518, 0960_SW001_220518,    |             |                          |                    |            |               |                  |            |
| 0960_SW300_220518, 0960_SW211_220518,    |             |                          |                    |            |               |                  |            |
| 0960_SW210_220518, 0960_SW209_220518,    |             |                          |                    |            |               |                  |            |
| 0960_SW302_220518, 0960_SW207_220518     |             |                          |                    |            |               |                  |            |





Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                                                                                                                                                                                                                                                                                                                    | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|
| Container / Client Sample ID(s)                                                                                                                                                                                                                                                                                                           |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA                                                                                                                                                                                                                                                                                           |             |                          |                    |            |               |                  |            |
| Clear Plastic Bottle - Natural (ED041G)<br>0960_SW288_220518, 0960_QC110_220518, 0960_SW305_220518, 0960_SW303_220518, 0960_SW300_220518, 0960_SW210_220518, 0960_SW302_220518, 0960_SW193_220518, 0960_SW192_220518, 0960_SW304_220518, 0960_SW001_220518, 0960_SW211_220518, 0960_SW209_220518, 0960_SW207_220518                       | 18-May-2022 | ----                     | ----               | ----       | 24-May-2022   | 15-Jun-2022      | ✔          |
| ED045G: Chloride by Discrete Analyser                                                                                                                                                                                                                                                                                                     |             |                          |                    |            |               |                  |            |
| Clear Plastic Bottle - Natural (ED045G)<br>0960_SW288_220518, 0960_QC110_220518, 0960_SW305_220518, 0960_SW303_220518, 0960_SW300_220518, 0960_SW210_220518, 0960_SW302_220518, 0960_SW193_220518, 0960_SW192_220518, 0960_SW304_220518, 0960_SW001_220518, 0960_SW211_220518, 0960_SW209_220518, 0960_SW207_220518                       | 18-May-2022 | ----                     | ----               | ----       | 24-May-2022   | 15-Jun-2022      | ✔          |
| ED093F: Dissolved Major Cations                                                                                                                                                                                                                                                                                                           |             |                          |                    |            |               |                  |            |
| Clear Plastic Bottle - Natural (ED093F)<br>0960_SW288_220518, 0960_QC110_220518, 0960_SW305_220518, 0960_SW303_220518, 0960_SW300_220518, 0960_SW210_220518, 0960_SW302_220518, 0960_SW193_220518, 0960_SW192_220518, 0960_SW304_220518, 0960_SW001_220518, 0960_SW211_220518, 0960_SW209_220518, 0960_SW207_220518                       | 18-May-2022 | ----                     | ----               | ----       | 24-May-2022   | 25-May-2022      | ✔          |
| EP231A: Perfluoroalkyl Sulfonic Acids                                                                                                                                                                                                                                                                                                     |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)<br>0960_SW288_220518, 0960_QC110_220518, 0960_SW305_220518, 0960_SW303_220518, 0960_SW300_220518, 0960_SW210_220518, 0960_SW302_220518, 0960_QC301_220518, 0960_SW193_220518, 0960_SW192_220518, 0960_SW304_220518, 0960_SW001_220518, 0960_SW211_220518, 0960_SW209_220518, 0960_SW207_220518, 0960_QC401_220518 | 18-May-2022 | 27-May-2022              | 14-Nov-2022        | ✔          | 27-May-2022   | 14-Nov-2022      | ✔          |



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                     |                    | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |
|--------------------------------------------|--------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|
| Container / Client Sample ID(s)            |                    |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| EP231B: Perfluoroalkyl Carboxylic Acids    |                    |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                    |                    | 18-May-2022 | 27-May-2022              | 14-Nov-2022        | ✓          | 27-May-2022   | 14-Nov-2022      | ✓          |
| 0960_SW288_220518,                         | 0960_SW193_220518, |             |                          |                    |            |               |                  |            |
| 0960_QC110_220518,                         | 0960_SW192_220518, |             |                          |                    |            |               |                  |            |
| 0960_SW305_220518,                         | 0960_SW304_220518, |             |                          |                    |            |               |                  |            |
| 0960_SW303_220518,                         | 0960_SW001_220518, |             |                          |                    |            |               |                  |            |
| 0960_SW300_220518,                         | 0960_SW211_220518, |             |                          |                    |            |               |                  |            |
| 0960_SW210_220518,                         | 0960_SW209_220518, |             |                          |                    |            |               |                  |            |
| 0960_SW302_220518,                         | 0960_SW207_220518, |             |                          |                    |            |               |                  |            |
| 0960_QC301_220518,                         | 0960_QC401_220518  |             |                          |                    |            |               |                  |            |
| EP231C: Perfluoroalkyl Sulfonamides        |                    |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                    |                    | 18-May-2022 | 27-May-2022              | 14-Nov-2022        | ✓          | 27-May-2022   | 14-Nov-2022      | ✓          |
| 0960_SW288_220518,                         | 0960_SW193_220518, |             |                          |                    |            |               |                  |            |
| 0960_QC110_220518,                         | 0960_SW192_220518, |             |                          |                    |            |               |                  |            |
| 0960_SW305_220518,                         | 0960_SW304_220518, |             |                          |                    |            |               |                  |            |
| 0960_SW303_220518,                         | 0960_SW001_220518, |             |                          |                    |            |               |                  |            |
| 0960_SW300_220518,                         | 0960_SW211_220518, |             |                          |                    |            |               |                  |            |
| 0960_SW210_220518,                         | 0960_SW209_220518, |             |                          |                    |            |               |                  |            |
| 0960_SW302_220518,                         | 0960_SW207_220518, |             |                          |                    |            |               |                  |            |
| 0960_QC301_220518,                         | 0960_QC401_220518  |             |                          |                    |            |               |                  |            |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids |                    |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                    |                    | 18-May-2022 | 27-May-2022              | 14-Nov-2022        | ✓          | 27-May-2022   | 14-Nov-2022      | ✓          |
| 0960_SW288_220518,                         | 0960_SW193_220518, |             |                          |                    |            |               |                  |            |
| 0960_QC110_220518,                         | 0960_SW192_220518, |             |                          |                    |            |               |                  |            |
| 0960_SW305_220518,                         | 0960_SW304_220518, |             |                          |                    |            |               |                  |            |
| 0960_SW303_220518,                         | 0960_SW001_220518, |             |                          |                    |            |               |                  |            |
| 0960_SW300_220518,                         | 0960_SW211_220518, |             |                          |                    |            |               |                  |            |
| 0960_SW210_220518,                         | 0960_SW209_220518, |             |                          |                    |            |               |                  |            |
| 0960_SW302_220518,                         | 0960_SW207_220518, |             |                          |                    |            |               |                  |            |
| 0960_QC301_220518,                         | 0960_QC401_220518  |             |                          |                    |            |               |                  |            |
| EP231P: PFAS Sums                          |                    |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                    |                    | 18-May-2022 | 27-May-2022              | 14-Nov-2022        | ✓          | 27-May-2022   | 14-Nov-2022      | ✓          |
| 0960_SW288_220518,                         | 0960_SW193_220518, |             |                          |                    |            |               |                  |            |
| 0960_QC110_220518,                         | 0960_SW192_220518, |             |                          |                    |            |               |                  |            |
| 0960_SW305_220518,                         | 0960_SW304_220518, |             |                          |                    |            |               |                  |            |
| 0960_SW303_220518,                         | 0960_SW001_220518, |             |                          |                    |            |               |                  |            |
| 0960_SW300_220518,                         | 0960_SW211_220518, |             |                          |                    |            |               |                  |            |
| 0960_SW210_220518,                         | 0960_SW209_220518, |             |                          |                    |            |               |                  |            |
| 0960_SW302_220518,                         | 0960_SW207_220518, |             |                          |                    |            |               |                  |            |
| 0960_QC301_220518,                         | 0960_QC401_220518  |             |                          |                    |            |               |                  |            |



## Quality Control Parameter Frequency Compliance

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

Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

| Quality Control Sample Type                            |         | Count |         | Rate (%) |          |            | Quality Control Specification  |
|--------------------------------------------------------|---------|-------|---------|----------|----------|------------|--------------------------------|
| Analytical Methods                                     | Method  | QC    | Regular | Actual   | Expected | Evaluation |                                |
|                                                        |         |       |         |          |          |            |                                |
| Laboratory Duplicates (DUP)                            |         |       |         |          |          |            |                                |
| Alkalinity by Auto Titrator                            | ED037-P | 4     | 40      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 4     | 38      | 10.53    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 0     | 20      | 0.00     | 10.00    | ✗          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Laboratory Control Samples (LCS)                       |         |       |         |          |          |            |                                |
| Alkalinity by Auto Titrator                            | ED037-P | 4     | 40      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 2     | 38      | 5.26     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Method Blanks (MB)                                     |         |       |         |          |          |            |                                |
| Alkalinity by Auto Titrator                            | ED037-P | 2     | 40      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 2     | 38      | 5.26     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Matrix Spikes (MS)                                     |         |       |         |          |          |            |                                |
| Chloride by Discrete Analyser                          | ED045G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 0     | 20      | 0.00     | 5.00     | ✗          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |



## Brief Method Summaries

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

| Analytical Methods                                                 | Method       | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------------------|--------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alkalinity by Auto Titrator                                        | ED037-P      | WATER  | In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                                                                                                                                                                                                                |
| Sulfate (Turbidimetric) as SO <sub>4</sub> 2- by Discrete Analyser | ED041G       | WATER  | In house: Referenced to APHA 4500-SO <sub>4</sub> . Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO <sub>4</sub> suspension is measured by a photometer and the SO <sub>4</sub> -2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                         |
| Chloride by Discrete Analyser                                      | ED045G       | WATER  | In house: Referenced to APHA 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm.                                                                                                                                                                                                                                                                                                                                                                |
| Major Cations - Dissolved                                          | ED093F       | WATER  | In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                           |
| Ionic Balance by PCT DA and Turbi SO <sub>4</sub> DA               | * EN055 - PG | WATER  | In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS               | EP231X       | WATER  | In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements. |
| Preparation Methods                                                | Method       | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Solid Phase Extraction (SPE) for PFAS in water                     | ORG72        | WATER  | In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.                                                                                                                                                                                                |

## CERTIFICATE OF ANALYSIS

**Work Order** : **EP2206832**  
**Client** : **STANTEC AUSTRALIA PTY LTD**  
**Contact** : [REDACTED]  
**Address** : GROUND FLOOR 226 ADELAIDE TERRACE  
 PERTH 6000  
**Telephone** : ----  
**Project** : WA\_0960\_PFASOMP  
**Order number** : DEF19009/0960  
**C-O-C number** : 37676  
**Sampler** : [REDACTED]  
**Site** : DEF19009/Learmonth SED - MGMB  
**Quote number** : SY/139/19 B  
**No. of samples received** : 1  
**No. of samples analysed** : 1

**Page** : 1 of 5  
**Laboratory** : Environmental Division Perth  
**Contact** : [REDACTED]  
**Address** : 26 Rigali Way Wangara Western Australia Australia 6065  
**Telephone** : +6138549 9609  
**Date Samples Received** : 20-May-2022 11:30  
**Date Analysis Commenced** : 09-Jun-2022  
**Issue Date** : 14-Jun-2022 09:46



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             |
|------------------------------------------------------------------------|------------------|------------------------------------|
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator | Sydney Inorganics, Smithfield, NSW |
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator | Sydney Organics, Smithfield, NSW   |



## 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.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- This workorder is a rebatch of EP2205953.
- 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<br>(Matrix: SOIL)                 |            | Sample ID         |       | 0960_SS176_220517 | ----  | ----  | ----  | ----  |
| Sampling date / time                               |            | 17-May-2022 16:23 |       | ----              | ----  | ----  | ----  | ----  |
| Compound                                           | CAS Number | LOR               | Unit  | EP2206832-001     | ----- | ----- | ----- | ----- |
| Result                                             |            |                   |       | ----              | ----  | ----  | ----  | ----  |
| <b>EA055: Moisture Content (Dried @ 105-110°C)</b> |            |                   |       |                   |       |       |       |       |
| Moisture Content                                   | ----       | 0.1               | %     | 20.2              | ----  | ----  | ----  | ----  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>       |            |                   |       |                   |       |       |       |       |
| 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 | 0.0243            | ----  | ----  | ----  | ----  |
| Perfluorodecane sulfonic acid (PFDS)               | 335-77-3   | 0.0002            | mg/kg | <0.0002           | ----  | ----  | ----  | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>     |            |                   |       |                   |       |       |       |       |
| 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           | ----  | ----  | ----  | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>         |            |                   |       |                   |       |       |       |       |
| 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<br>(Matrix: SOIL)                        |                    |        |       | Sample ID            | 0960_SS176_220517 | ----  | ----  | ----  | ----  |
|                                                           |                    |        |       | Sampling date / time | 17-May-2022 16:23 | ----  | ----  | ----  | ----  |
| Compound                                                  | CAS Number         | LOR    | Unit  |                      | EP2206832-001     | ----- | ----- | ----- | ----- |
|                                                           |                    |        |       | 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 | 0.0243               | ----              | ----  | ----  | ----  | ----  |
| Sum of PFHxS and PFOS                                     | 355-46-4/1763-23-1 | 0.0002 | mg/kg | 0.0243               | ----              | ----  | ----  | ----  | ----  |
| Sum of PFAS (WA DER List)                                 | ----               | 0.0002 | mg/kg | 0.0243               | ----              | ----  | ----  | ----  | ----  |
| EP231S: PFAS Surrogate                                    |                    |        |       |                      |                   |       |       |       |       |
| 13C4-PFOS                                                 | ----               | 0.0002 | %     | 88.0                 | ----              | ----  | ----  | ----  | ----  |
| 13C8-PFOA                                                 | ----               | 0.0002 | %     | 84.0                 | ----              | ----  | ----  | ----  | ----  |

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Work Order : EP2206832  
Client : STANTEC AUSTRALIA PTY LTD  
Project : WA\_0960\_PFASOMP



## Surrogate Control Limits

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

## Inter-Laboratory Testing

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

## QUALITY CONTROL REPORT

|                         |                                                   |                         |                                                          |
|-------------------------|---------------------------------------------------|-------------------------|----------------------------------------------------------|
| Work Order              | : EP2206832                                       | Page                    | : 1 of 7                                                 |
| Client                  | : STANTEC AUSTRALIA PTY LTD                       | Laboratory              | : Environmental Division Perth                           |
| Contact                 | : [REDACTED]                                      | Contact                 | : [REDACTED]                                             |
| Address                 | : GROUND FLOOR 226 ADELAIDE TERRACE<br>PERTH 6000 | Address                 | : 26 Rigali Way Wangara Western Australia Australia 6065 |
| Telephone               | : ----                                            | Telephone               | : +6138549 9609                                          |
| Project                 | : WA_0960_PFASOMP                                 | Date Samples Received   | : 20-May-2022                                            |
| Order number            | : DEF19009/0960                                   | Date Analysis Commenced | : 09-Jun-2022                                            |
| C-O-C number            | : 37676                                           | Issue Date              | : 14-Jun-2022                                            |
| Sampler                 | : [REDACTED]                                      |                         |                                                          |
| Site                    | : DEF19009/Learmonth SED - MGMB                   |                         |                                                          |
| Quote number            | : SY/139/19 B                                     |                         |                                                          |
| No. of samples received | : 1                                               |                         |                                                          |
| No. of samples analysed | : 1                                               |                         |                                                          |



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]  | LCMS Coordinator | Sydney Inorganics, Smithfield, NSW |
| [REDACTED]  | LCMS Coordinator | Sydney Organics, Smithfield, NSW   |



## 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: <b>SOIL</b>                                       |                   |                                                |            | 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: 4393329) |                   |                                                |            |                                   |       |                 |                  |         |                    |
| ES2219474-002                                                 | Anonymous         | EA055: Moisture Content                        | ----       | 0.1                               | %     | 73.8            | 72.7             | 1.5     | 0% - 20%           |
| ES2219747-003                                                 | Anonymous         | EA055: Moisture Content                        | ----       | 0.1                               | %     | 8.5             | 8.6              | 1.6     | 0% - 20%           |
| EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4388241)       |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2206832-001                                                 | 0960_SS176_220517 | 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 | 0.0243          | 0.0232           | 4.4     | 0% - 20%           |
|                                                               |                   | EP231X: Perfluorodecane sulfonic acid (PFDS)   | 335-77-3   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
| ES2217820-012                                                 | 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: 4388241)     |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2206832-001                                                 | 0960_SS176_220517 | 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: 4388241) - continued |                   |                                                                   |            |                                   |       |                 |                  |         |                    |
| EP2206832-001                                                         | 0960_SS176_220517 | EP231X: Perfluorotridecanoic acid (PFTTrDA)                       | 72629-94-8 | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                       |                   | EP231X: Perfluorotetradecanoic acid (PFTTeDA)                     | 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           |
| ES2217820-012                                                         | 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 (PFTTeDA)                     | 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: 4388241)                 |                   |                                                                   |            |                                   |       |                 |                  |         |                    |
| EP2206832-001                                                         | 0960_SS176_220517 | 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           |
| ES2217820-012                                                         | 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           |

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 Work Order : EP2206832  
 Client : STANTEC AUSTRALIA PTY LTD  
 Project : WA\_0960\_PFASOMP



| Sub-Matrix: <b>SOIL</b>                                             |                   |                                                     |             | Laboratory Duplicate (DUP) Report |       |                 |                  |         |                    |
|---------------------------------------------------------------------|-------------------|-----------------------------------------------------|-------------|-----------------------------------|-------|-----------------|------------------|---------|--------------------|
| Laboratory sample ID                                                | Sample ID         | Method: Compound                                    | CAS Number  | LOR                               | Unit  | Original Result | Duplicate Result | RPD (%) | Acceptable RPD (%) |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4388241)</b> |                   |                                                     |             |                                   |       |                 |                  |         |                    |
| EP2206832-001                                                       | 0960_SS176_220517 | 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           |
| ES2217820-012                                                       | 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           |



## 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**

| Sub-Matrix: SOIL                                                  |             |        |       | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |     |
|-------------------------------------------------------------------|-------------|--------|-------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|-----|
|                                                                   |             |        |       |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |     |
| Method: Compound                                                  | CAS Number  | LOR    | Unit  | Result                      |                                       |                           |                                   |     |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4388241)            |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: Perfluorobutane sulfonic acid (PFBS)                      | 375-73-5    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 107                       | 72.0                              | 128 |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)                    | 2706-91-4   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 110                       | 73.0                              | 123 |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)                     | 355-46-4    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 106                       | 67.0                              | 130 |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)                    | 375-92-8    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 122                       | 70.0                              | 132 |
| EP231X: Perfluorooctane sulfonic acid (PFOS)                      | 1763-23-1   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 118                       | 68.0                              | 136 |
| EP231X: Perfluorodecane sulfonic acid (PFDS)                      | 335-77-3    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 122                       | 59.0                              | 134 |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4388241)          |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: Perfluorobutanoic acid (PFBA)                             | 375-22-4    | 0.001  | mg/kg | <0.001                      | 0.00625 mg/kg                         | 113                       | 71.0                              | 135 |
| EP231X: Perfluoropentanoic acid (PFPeA)                           | 2706-90-3   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 110                       | 69.0                              | 132 |
| EP231X: Perfluorohexanoic acid (PFHxA)                            | 307-24-4    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 116                       | 70.0                              | 132 |
| EP231X: Perfluoroheptanoic acid (PFHpA)                           | 375-85-9    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 117                       | 71.0                              | 131 |
| EP231X: Perfluorooctanoic acid (PFOA)                             | 335-67-1    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 121                       | 69.0                              | 133 |
| EP231X: Perfluorononanoic acid (PFNA)                             | 375-95-1    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 105                       | 72.0                              | 129 |
| EP231X: Perfluorodecanoic acid (PFDA)                             | 335-76-2    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 114                       | 69.0                              | 133 |
| EP231X: Perfluoroundecanoic acid (PFUnDA)                         | 2058-94-8   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 122                       | 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                         | 99.6                      | 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: 4388241)              |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 111                       | 67.0                              | 137 |
| EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 118                       | 71.6                              | 129 |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 121                       | 69.8                              | 131 |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 113                       | 68.7                              | 130 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 116                       | 65.1                              | 134 |
| EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 114                       | 63.0                              | 144 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 107                       | 61.0                              | 139 |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4388241)       |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.0005 | mg/kg | <0.0005                     | 0.00125 mg/kg                         | 107                       | 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                         | 105                       | 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                         | 111                       | 65.0                              | 137 |



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 Work Order : EP2206832  
 Client : STANTEC AUSTRALIA PTY LTD  
 Project : WA\_0960\_PFASOMP



| Sub-Matrix: SOIL                                                        |             |        |       | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                    |                       |      |
|-------------------------------------------------------------------------|-------------|--------|-------|-----------------------------|---------------------------------------|--------------------|-----------------------|------|
| Method: Compound                                                        | CAS Number  | LOR    | Unit  |                             | Spike                                 | Spike Recovery (%) | Acceptable Limits (%) |      |
|                                                                         |             |        |       |                             | Concentration                         | LCS                | Low                   | High |
|                                                                         |             |        |       |                             |                                       |                    |                       |      |
|                                                                         |             |        |       |                             |                                       |                    |                       |      |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4388241) - continued |             |        |       |                             |                                       |                    |                       |      |
| EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)                     | 120226-60-0 | 0.0005 | mg/kg | <0.0005                     | 0.00125 mg/kg                         | 106                | 69.2                  | 143  |

## 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                                         |                   |                                                              |            | 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: 4388241)   |                   |                                                              |            |                          |                  |                       |      |
| EP2206832-001                                            | 0960_SS176_220517 | EP231X: Perfluorobutane sulfonic acid (PFBS)                 | 375-73-5   | 0.00125 mg/kg            | 122              | 72.0                  | 128  |
|                                                          |                   | EP231X: Perfluoropentane sulfonic acid (PFPeS)               | 2706-91-4  | 0.00125 mg/kg            | 107              | 73.0                  | 123  |
|                                                          |                   | EP231X: Perfluorohexane sulfonic acid (PFHxS)                | 355-46-4   | 0.00125 mg/kg            | 118              | 67.0                  | 130  |
|                                                          |                   | EP231X: Perfluoroheptane sulfonic acid (PFHpS)               | 375-92-8   | 0.00125 mg/kg            | 116              | 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            | 121              | 59.0                  | 134  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4388241) |                   |                                                              |            |                          |                  |                       |      |
| EP2206832-001                                            | 0960_SS176_220517 | EP231X: Perfluorobutanoic acid (PFBA)                        | 375-22-4   | 0.00625 mg/kg            | 110              | 71.0                  | 135  |
|                                                          |                   | EP231X: Perfluoropentanoic acid (PFPeA)                      | 2706-90-3  | 0.00125 mg/kg            | 110              | 69.0                  | 132  |
|                                                          |                   | EP231X: Perfluorohexanoic acid (PFHxA)                       | 307-24-4   | 0.00125 mg/kg            | 121              | 70.0                  | 132  |
|                                                          |                   | EP231X: Perfluoroheptanoic acid (PFHpA)                      | 375-85-9   | 0.00125 mg/kg            | 110              | 71.0                  | 131  |
|                                                          |                   | EP231X: Perfluorooctanoic acid (PFOA)                        | 335-67-1   | 0.00125 mg/kg            | 119              | 69.0                  | 133  |
|                                                          |                   | EP231X: Perfluorononanoic acid (PFNA)                        | 375-95-1   | 0.00125 mg/kg            | 110              | 72.0                  | 129  |
|                                                          |                   | EP231X: Perfluorodecanoic acid (PFDA)                        | 335-76-2   | 0.00125 mg/kg            | 106              | 69.0                  | 133  |
|                                                          |                   | EP231X: Perfluoroundecanoic acid (PFUnDA)                    | 2058-94-8  | 0.00125 mg/kg            | 123              | 64.0                  | 136  |
|                                                          |                   | EP231X: Perfluorododecanoic acid (PFDoDA)                    | 307-55-1   | 0.00125 mg/kg            | 129              | 69.0                  | 135  |
|                                                          |                   | EP231X: Perfluorotridecanoic acid (PFTrDA)                   | 72629-94-8 | 0.00125 mg/kg            | 95.6             | 66.0                  | 139  |
|                                                          |                   | EP231X: Perfluorotetradecanoic acid (PFTeDA)                 | 376-06-7   | 0.00312 mg/kg            | 94.9             | 69.0                  | 133  |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4388241)     |                   |                                                              |            |                          |                  |                       |      |
| EP2206832-001                                            | 0960_SS176_220517 | EP231X: Perfluorooctane sulfonamide (FOSA)                   | 754-91-6   | 0.00125 mg/kg            | 108              | 67.0                  | 137  |
|                                                          |                   | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)        | 31506-32-8 | 0.00312 mg/kg            | 126              | 71.6                  | 129  |
|                                                          |                   | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)         | 4151-50-2  | 0.00312 mg/kg            | 110              | 69.8                  | 131  |
|                                                          |                   | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE) | 24448-09-7 | 0.00312 mg/kg            | 111              | 68.7                  | 130  |
|                                                          |                   | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)  | 1691-99-2  | 0.00312 mg/kg            | 111              | 65.1                  | 134  |

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Sub-Matrix: **SOIL**

| 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: 4388241) - continued |                   |                                                                   |             |                          |                  |                       |      |
| EP2206832-001                                                    | 0960_SS176_220517 | 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            | 125              | 61.0                  | 139  |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4388241)      |                   |                                                                   |             |                          |                  |                       |      |
| EP2206832-001                                                    | 0960_SS176_220517 | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.00125 mg/kg            | 111              | 62.0                  | 145  |
|                                                                  |                   | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 27619-97-2  | 0.00125 mg/kg            | 91.6             | 64.0                  | 140  |
|                                                                  |                   | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | 39108-34-4  | 0.00125 mg/kg            | 97.2             | 65.0                  | 137  |
|                                                                  |                   | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | 120226-60-0 | 0.00125 mg/kg            | 98.4             | 69.2                  | 143  |

## QA/QC Compliance Assessment to assist with Quality Review

|              |                                 |                         |                                |
|--------------|---------------------------------|-------------------------|--------------------------------|
| Work Order   | : EP2206832                     | Page                    | : 1 of 5                       |
| Client       | : STANTEC AUSTRALIA PTY LTD     | Laboratory              | : Environmental Division Perth |
| Contact      | : [REDACTED]                    | Telephone               | : +6138549 9609                |
| Project      | : WA_0960_PFASOMP               | Date Samples Received   | : 20-May-2022                  |
| Site         | : DEF19009/Learmonth SED - MGMB | Issue Date              | : 14-Jun-2022                  |
| Sampler      | : [REDACTED]                    | No. of samples received | : 1                            |
| Order number | : DEF19009/0960                 | 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

- Analysis Holding Time Outliers exist - please see following pages for full details.

#### 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                                                                               |
|---------------------------------------|----------------------|-------------------|--------------------------------------|------------|----------------|--------|---------------------------------------------------------------------------------------|
| <b>Matrix Spike (MS) Recoveries</b>   |                      |                   |                                      |            |                |        |                                                                                       |
| EP231A: Perfluoroalkyl Sulfonic Acids | EP2206832--001       | 0960_SS176_220517 | Perfluorooctane sulfonic acid (PFOS) | 1763-23-1  | Not Determined | ----   | MS recovery not determined, background level greater than or equal to 4x spike level. |

## 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 |
| <b>EA055: Moisture Content (Dried @ 105-110°C)</b> |                          |                    |              |               |                  |              |
| HDPE Soil Jar<br>0960_SS176_220517                 | ----                     | ----               | ----         | 10-Jun-2022   | 31-May-2022      | 10           |

## 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      |                  |            |
|----------------------------------------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|
| Container / Client Sample ID(s)                    |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| <b>EA055: Moisture Content (Dried @ 105-110°C)</b> |             |                          |                    |            |               |                  |            |
| HDPE Soil Jar (EA055)<br>0960_SS176_220517         | 17-May-2022 | ----                     | ----               | ----       | 10-Jun-2022   | 31-May-2022      | ✖          |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>       |             |                          |                    |            |               |                  |            |
| HDPE Soil Jar (EP231X)<br>0960_SS176_220517        | 17-May-2022 | 09-Jun-2022              | 13-Nov-2022        | ✔          | 09-Jun-2022   | 19-Jul-2022      | ✔          |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>     |             |                          |                    |            |               |                  |            |
| HDPE Soil Jar (EP231X)<br>0960_SS176_220517        | 17-May-2022 | 09-Jun-2022              | 13-Nov-2022        | ✔          | 09-Jun-2022   | 19-Jul-2022      | ✔          |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>         |             |                          |                    |            |               |                  |            |
| HDPE Soil Jar (EP231X)<br>0960_SS176_220517        | 17-May-2022 | 09-Jun-2022              | 13-Nov-2022        | ✔          | 09-Jun-2022   | 19-Jul-2022      | ✔          |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>  |             |                          |                    |            |               |                  |            |
| HDPE Soil Jar (EP231X)<br>0960_SS176_220517        | 17-May-2022 | 09-Jun-2022              | 13-Nov-2022        | ✔          | 09-Jun-2022   | 19-Jul-2022      | ✔          |



Matrix: SOIL

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                      | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |
|---------------------------------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|
| Container / Client Sample ID(s)             |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| EP231P: PFAS Sums                           |             |                          |                    |            |               |                  |            |
| HDPE Soil Jar (EP231X)<br>0960_SS176_220517 | 17-May-2022 | 09-Jun-2022              | 13-Nov-2022        | ✓          | 09-Jun-2022   | 19-Jul-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                          |        | Count |         | Rate (%) |          |            | Quality Control Specification  |
|------------------------------------------------------|--------|-------|---------|----------|----------|------------|--------------------------------|
| Analytical Methods                                   | Method | QC    | Regular | Actual   | Expected | Evaluation |                                |
| Laboratory Duplicates (DUP)                          |        |       |         |          |          |            |                                |
| Moisture Content                                     | EA055  | 2     | 20      | 10.00    | 10.00    | ✔          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 2     | 20      | 10.00    | 10.00    | ✔          | NEPM 2013 B3 & ALS QC Standard |
| Laboratory Control Samples (LCS)                     |        |       |         |          |          |            |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 1     | 20      | 5.00     | 5.00     | ✔          | NEPM 2013 B3 & ALS QC Standard |
| Method Blanks (MB)                                   |        |       |         |          |          |            |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 1     | 20      | 5.00     | 5.00     | ✔          | NEPM 2013 B3 & ALS QC Standard |
| Matrix Spikes (MS)                                   |        |       |         |          |          |            |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 1     | 20      | 5.00     | 5.00     | ✔          | NEPM 2013 B3 & ALS QC Standard |



## Brief Method Summaries

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

| <i>Analytical Methods</i>                            | <i>Method</i> | <i>Matrix</i> | <i>Method Descriptions</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------------------------------|---------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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. |
| <i>Preparation Methods</i>                           | <i>Method</i> | <i>Matrix</i> | <i>Method Descriptions</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 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.                                                                                                                                                                                                                                   |



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## CLIENT DETAILS

|                                                           |                                                                                                                                                                                                |                                  |                                |
|-----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|--------------------------------|
| Company Name : Cardno (WA) Pty Ltd                        | Contact Name : Maelle Bourdais                                                                                                                                                                 | Purchase Order : PFAS-OMP        | COC Number : PFAS-OMP -01      |
| Office Address : 11 Harvest Terrace, West perth, WA, 6005 |                                                                                                                                                                                                | PROJECT Number : WA_0960_PFASOMP | Eurofins   mgt quote ID : NA   |
|                                                           | Email for COC/SRN/Results : <a href="mailto:maelle.bourdais@cardno.com.au">maelle.bourdais@cardno.com.au</a><br><a href="mailto:derp.labreports@esdat.com.au">derp.labreports@esdat.com.au</a> | PROJECT Name : WA_0960_PFASOMP   | Data output format: PDF; ESDAT |

|                                                                                                                                                                                                                                                                                                                                                                 |  | Analytes    |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Some common holding times (with correct preservation).<br>For further information contact the lab |        |                |                                |                |                               |          |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---------------------------------------------------------------------------------------------------|--------|----------------|--------------------------------|----------------|-------------------------------|----------|
| Special Directions & Comments :<br>Please send ESdat files to <a href="mailto:derp.labreports@esdat.com.au">derp.labreports@esdat.com.au</a> with the project No in the header file<br><br>Please send email invoice to <a href="mailto:claire.armstrong@cardno.com.au">claire.armstrong@cardno.com.au</a><br><br><br><br>Eurofins   mgt DI water batch number: |  | 8 analytes) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                   | Waters |                | Soils                          |                |                               |          |
|                                                                                                                                                                                                                                                                                                                                                                 |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                   |        | BTEX, MAH, VOC | 14 days                        | BTEX, MAH, VOC | 14 days                       |          |
|                                                                                                                                                                                                                                                                                                                                                                 |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                   |        |                | TRH, PAH, Phenols, Pesticides  | 7 days         | TRH, PAH, Phenols, Pesticides | 14 days  |
|                                                                                                                                                                                                                                                                                                                                                                 |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                   |        |                | Heavy Metals                   | 6 months       | Heavy Metals                  | 6 months |
|                                                                                                                                                                                                                                                                                                                                                                 |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                   |        |                | Mercury, CrVI                  | 28 days        | Mercury, CrVI                 | 28 days  |
|                                                                                                                                                                                                                                                                                                                                                                 |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                   |        |                | Microbiological testing        | 24 hours       | Microbiological testing       | 72 hours |
|                                                                                                                                                                                                                                                                                                                                                                 |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                   |        |                | BOD, Nitrate, Nitrite, Total N | 2 days         | Anions                        | 28 days  |
|                                                                                                                                                                                                                                                                                                                                                                 |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                   |        |                | Solids - TSS, TDS etc          | 7 days         | SPOCAS, pH Field and FOX, CrS | 24 hours |
|                                                                                                                                                                                                                                                                                                                                                                 |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                                                                                   |        |                | Ferrous iron                   | 7 days         | ASLP, TCLP                    | 7 days   |

[illegible]

|                             |                                      |                                                                                              |  |                                                                                                                           |  |                         |
|-----------------------------|--------------------------------------|----------------------------------------------------------------------------------------------|--|---------------------------------------------------------------------------------------------------------------------------|--|-------------------------|
| Laboratory Staff            |                                      | Turn around time                                                                             |  | Method Of Shipment                                                                                                        |  | Temperature on arrival: |
| Relinquished By:<br>Cardno  | Received By:<br><i>MS</i>            | 1 DAY <input type="checkbox"/> 2 DAY <input type="checkbox"/> 3 DAY <input type="checkbox"/> |  | <input checked="" type="checkbox"/> Courier<br><input type="checkbox"/> Hand Delivered<br><input type="checkbox"/> Postal |  | <i>19.9</i>             |
| Date & Time :<br>18/05/2022 | Date & Time :<br><i>20/5/22 1000</i> | STANDARD <input checked="" type="checkbox"/> Other:                                          |  | Courier Consignment # : 00903WFOPB                                                                                        |  | Report number:          |
| Signature:                  | Signature:<br><i>[Signature]</i>     |                                                                                              |  |                                                                                                                           |  |                         |

890781

**Eurofins ARL Pty Ltd**

ABN: 91 05 0159 898

Perth  
46-48 Banksia Road  
Welshpool WA 6106  
Phone : +61 8 6253 4444  
NATA # 2377 Site # 2370

**Eurofins Environment Testing Australia Pty Ltd**

ABN: 50 005 085 521

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6 Monterey Road  
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179 Magowar Road  
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Phone : +61 7 3902 4600  
NATA # 1261 Site # 20794

Newcastle  
4/52 Industrial Drive  
Mayfield East NSW 2304  
PO Box 60 Wickham 2293  
Phone : +61 2 4968 8448  
NATA # 1261 Site # 25079

**Eurofins Environment Testing NZ Limited**

NZBN: 9429046024954

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Penrose, Auckland 1061  
Phone : +64 9 526 45 51  
IANZ # 1327

Christchurch  
43 Detroit Drive  
Rolleston, Christchurch 7675  
Phone : 0800 856 450  
IANZ # 1290

## Sample Receipt Advice

**Company name:** Cardno (WA)  
**Contact name:** [REDACTED]  
**Project name:** Not provided  
**Project ID:** WA\_0960\_PFASOMP  
**Turnaround time:** 5 Day  
**Date/Time received:** May 20, 2022 10:00 AM  
**Eurofins reference:** 890781

## Sample Information

- ✓ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ✓ Sample Temperature of chilled sample on the batch as recorded by Eurofins Sample Receipt : 19.9 degrees Celsius.
- ✓ All samples have been received as described on the above COC.
- ✓ COC has been completed correctly.
- ✓ Attempt to chill was evident.
- ✓ Appropriately preserved sample containers have been used.
- ✓ All samples were received in good condition.
- ✓ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ✓ Appropriate sample containers have been used.
- ✓ Sample containers for volatile analysis received with zero headspace.
- ✗ Split sample sent to requested external lab.
- ✗ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

## Notes

## Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

[REDACTED] on phone : or by email: [RobertJohnston@eurofins.com](mailto:RobertJohnston@eurofins.com)

Results will be delivered electronically via email to [REDACTED] - [REDACTED]@cardno.com.au.

*Note: A copy of these results will also be delivered to the general Cardno (WA) email address.*



ARL

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43 Detroit Drive  
Rolleston, Christchurch 7675  
Phone : 0800 856 450  
IANZ # 1290

web: www.eurofins.com.au

email: EnviroSales@eurofins.com

**Company Name:** Cardno (WA)  
**Address:** 11 Harvest Terrace  
West Perth  
WA 6005  
  
**Project Name:**  
**Project ID:** WA\_0960\_PFASOMP

**Order No.:**  
**Report #:** 890781  
**Phone:** 08 9273 3888  
**Fax:** 08 9388 3831

**Received:** May 20, 2022 10:00 AM  
**Due:** May 27, 2022  
**Priority:** 5 Day  
**Contact Name:** [REDACTED]

Eurofins Analytical Services Manager : [REDACTED]

| Sample Detail                                  |                   |              |               |        |               | Moisture Set | PFAS (Full Suite) Water Std | PFAS (Full Suite) Soil |
|------------------------------------------------|-------------------|--------------|---------------|--------|---------------|--------------|-----------------------------|------------------------|
| Perth Laboratory - NATA # 2377 Site # 2370     |                   |              |               |        |               | X            | X                           | X                      |
| Melbourne Laboratory - NATA # 1261 Site # 1254 |                   |              |               |        |               |              |                             |                        |
| Sydney Laboratory - NATA # 1261 Site # 18217   |                   |              |               |        |               |              |                             |                        |
| Brisbane Laboratory - NATA # 1261 Site # 20794 |                   |              |               |        |               |              |                             |                        |
| Mayfield Laboratory - NATA # 1261 Site # 25079 |                   |              |               |        |               |              |                             |                        |
| External Laboratory                            |                   |              |               |        |               |              |                             |                        |
| No                                             | Sample ID         | Sample Date  | Sampling Time | Matrix | LAB ID        |              |                             |                        |
| 1                                              | 0960_QC205_220517 | May 17, 2022 |               | Soil   | L22-My0054072 | X            |                             | X                      |
| 2                                              | 0960_QC206_220517 | May 17, 2022 |               | Soil   | L22-My0054073 | X            |                             | X                      |
| 3                                              | 0960_QC207_220517 | May 17, 2022 |               | Soil   | L22-My0054074 | X            |                             | X                      |
| 4                                              | 0960_QC208_220517 | May 17, 2022 |               | Water  | L22-My0054075 |              | X                           |                        |
| 5                                              | 0960_QC209_220517 | May 17, 2022 |               | Water  | L22-My0054076 |              | X                           |                        |
| 6                                              | 0960_QC210_       | May 18, 2022 |               | Water  | L22-          |              | X                           |                        |



ARL

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WA 6005

**Project Name:**  
**Project ID:** WA\_0960\_PFASOMP

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**Phone:** 08 9273 3888  
**Fax:** 08 9388 3831

**Received:** May 20, 2022 10:00 AM  
**Due:** May 27, 2022  
**Priority:** 5 Day  
**Contact Name:** [REDACTED]

Eurofins Analytical Services Manager : [REDACTED]

## Sample Detail

Moisture Set

PFAS (Full Suite) Water Std

PFAS (Full Suite) Soil

Perth Laboratory - NATA # 2377 Site # 2370

Melbourne Laboratory - NATA # 1261 Site # 1254

Sydney Laboratory - NATA # 1261 Site # 18217

Brisbane Laboratory - NATA # 1261 Site # 20794

Mayfield Laboratory - NATA # 1261 Site # 25079

External Laboratory

|   |                   |              |  |      |               |   |  |   |
|---|-------------------|--------------|--|------|---------------|---|--|---|
|   | 220518            |              |  |      | My0054077     |   |  |   |
| 7 | 0960_QC211_220518 | May 18, 2022 |  | Soil | L22-My0054078 | X |  | X |
| 8 | 0960_QC212_220518 | May 18, 2022 |  | Soil | L22-My0054079 | X |  | X |

Test Counts

5 3 5

**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**

PFAS (Full Suite) Water Std

**Testing Site**

Welshpool

**Extracted**

May 23, 2022

**Holding Time**

28 Days

- Method: ARL510 - Per and Polyfluoroalkyl Substances in Water by LCMS

**Company Name:** Cardno (WA)  
**Address:** 11 Harvest Terrace  
West Perth  
WA 6005  
  
**Project Name:**  
**Project ID:** WA\_0960\_PFASOMP

**Order No.:**  
**Report #:** 890781  
**Phone:** 08 9273 3888  
**Fax:** 08 9388 3831

**Received:** May 20, 2022 10:00 AM  
**Due:** May 27, 2022  
**Priority:** 5 Day  
**Contact Name:** [REDACTED]

**Eurofins Analytical Services Manager :** [REDACTED]

| Sample Detail                                  |                   |              |               |        |               | Moisture Set | PFAS (Full Suite) Water Std | PFAS (Full Suite) Soil |
|------------------------------------------------|-------------------|--------------|---------------|--------|---------------|--------------|-----------------------------|------------------------|
| Perth Laboratory - NATA # 2377 Site # 2370     |                   |              |               |        |               | X            | X                           | X                      |
| Melbourne Laboratory - NATA # 1261 Site # 1254 |                   |              |               |        |               |              |                             |                        |
| Sydney Laboratory - NATA # 1261 Site # 18217   |                   |              |               |        |               |              |                             |                        |
| Brisbane Laboratory - NATA # 1261 Site # 20794 |                   |              |               |        |               |              |                             |                        |
| Mayfield Laboratory - NATA # 1261 Site # 25079 |                   |              |               |        |               |              |                             |                        |
| External Laboratory                            |                   |              |               |        |               |              |                             |                        |
| No                                             | Sample ID         | Sample Date  | Sampling Time | Matrix | LAB ID        |              |                             |                        |
| 1                                              | 0960_QC205_220517 | May 17, 2022 |               | Soil   | L22-My0054072 | X            |                             | X                      |
| 2                                              | 0960_QC206_220517 | May 17, 2022 |               | Soil   | L22-My0054073 | X            |                             | X                      |
| 3                                              | 0960_QC207_220517 | May 17, 2022 |               | Soil   | L22-My0054074 | X            |                             | X                      |
| 4                                              | 0960_QC208_220517 | May 17, 2022 |               | Water  | L22-My0054075 |              | X                           |                        |
| 5                                              | 0960_QC209_220517 | May 17, 2022 |               | Water  | L22-My0054076 |              | X                           |                        |
| 6                                              | 0960_QC210_       | May 18, 2022 |               | Water  | L22-          |              | X                           |                        |

**Company Name:** Cardno (WA)  
**Address:** 11 Harvest Terrace  
West Perth  
WA 6005  
  
**Project Name:**  
**Project ID:** WA\_0960\_PFASOMP

**Order No.:**  
**Report #:** 890781  
**Phone:** 08 9273 3888  
**Fax:** 08 9388 3831

**Received:** May 20, 2022 10:00 AM  
**Due:** May 27, 2022  
**Priority:** 5 Day  
**Contact Name:** [REDACTED]

**Eurofins Analytical Services Manager :** [REDACTED]

| Sample Detail                                  |                   |              |  |      |               | Moisture Set | PFAS (Full Suite) Water Std | PFAS (Full Suite) Soil |
|------------------------------------------------|-------------------|--------------|--|------|---------------|--------------|-----------------------------|------------------------|
| Perth Laboratory - NATA # 2377 Site # 2370     |                   |              |  |      |               | X            | X                           | X                      |
| Melbourne Laboratory - NATA # 1261 Site # 1254 |                   |              |  |      |               |              |                             |                        |
| Sydney Laboratory - NATA # 1261 Site # 18217   |                   |              |  |      |               |              |                             |                        |
| Brisbane Laboratory - NATA # 1261 Site # 20794 |                   |              |  |      |               |              |                             |                        |
| Mayfield Laboratory - NATA # 1261 Site # 25079 |                   |              |  |      |               |              |                             |                        |
| External Laboratory                            |                   |              |  |      |               |              |                             |                        |
|                                                | 220518            |              |  |      | My0054077     |              |                             |                        |
| 7                                              | 0960_QC211_220518 | May 18, 2022 |  | Soil | L22-My0054078 | X            |                             | X                      |
| 8                                              | 0960_QC212_220518 | May 18, 2022 |  | Soil | L22-My0054079 | X            |                             | X                      |
| Test Counts                                    |                   |              |  |      |               | 5            | 3                           | 5                      |



## 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

|                                                  |                                           |                                                                          |
|--------------------------------------------------|-------------------------------------------|--------------------------------------------------------------------------|
| <b>mg/kg:</b> milligrams per kilogram            | <b>mg/L:</b> milligrams per litre         | <b>µg/L:</b> micrograms per litre                                        |
| <b>ppm:</b> parts per million                    | <b>ppb:</b> parts per billion             | <b>%:</b> Percentage                                                     |
| <b>org/100 mL:</b> Organisms per 100 millilitres | <b>NTU:</b> Nephelometric Turbidity Units | <b>MPN/100 mL:</b> Most Probable Number of organisms per 100 millilitres |

### Terms

|                         |                                                                                                                                                                                                                                                                                               |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>APHA</b>             | American Public Health Association                                                                                                                                                                                                                                                            |
| <b>COC</b>              | Chain of Custody                                                                                                                                                                                                                                                                              |
| <b>CP</b>               | Client Parent - QC was performed on samples pertaining to this report                                                                                                                                                                                                                         |
| <b>CRM</b>              | Certified Reference Material (ISO17034) - reported as percent recovery.                                                                                                                                                                                                                       |
| <b>Dry</b>              | Where a moisture has been determined on a solid sample the result is expressed on a dry basis.                                                                                                                                                                                                |
| <b>Duplicate</b>        | A second piece of analysis from the same sample and reported in the same units as the result to show comparison.                                                                                                                                                                              |
| <b>LOR</b>              | Limit of Reporting.                                                                                                                                                                                                                                                                           |
| <b>LCS</b>              | Laboratory Control Sample - reported as percent recovery.                                                                                                                                                                                                                                     |
| <b>Method Blank</b>     | 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.                                                                                                                                |
| <b>NCP</b>              | 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.                                                                                                                            |
| <b>RPD</b>              | Relative Percent Difference between two Duplicate pieces of analysis.                                                                                                                                                                                                                         |
| <b>SPIKE</b>            | Addition of the analyte to the sample and reported as percentage recovery.                                                                                                                                                                                                                    |
| <b>SRA</b>              | Sample Receipt Advice                                                                                                                                                                                                                                                                         |
| <b>Surr - Surrogate</b> | The addition of a like compound to the analyte target and reported as percentage recovery.                                                                                                                                                                                                    |
| <b>TBTO</b>             | 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. |
| <b>TCLP</b>             | Toxicity Characteristic Leaching Procedure                                                                                                                                                                                                                                                    |
| <b>TEQ</b>              | Toxic Equivalency Quotient or Total Equivalence                                                                                                                                                                                                                                               |
| <b>QSM</b>              | US Department of Defense Quality Systems Manual Version 5.4                                                                                                                                                                                                                                   |
| <b>US EPA</b>           | United States Environmental Protection Agency                                                                                                                                                                                                                                                 |
| <b>WA DWER</b>          | 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.

## Comments

### Sample Integrity

|                                                                         |     |
|-------------------------------------------------------------------------|-----|
| Custody Seals Intact (if used)                                          | N/A |
| Attempt to Chill was evident                                            | Yes |
| Sample correctly preserved                                              | Yes |
| Appropriate sample containers have been used                            | Yes |
| Sample containers for volatile analysis received with minimal headspace | Yes |
| Samples received within HoldingTime                                     | Yes |
| Some samples have been subcontracted                                    | No  |

### Authorised by:

██████████  
██████████

Analytical Services Manager  
Senior Analyst-PFAS



██████████

### Business Unit 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

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.

Cardno Consulting WA  
11 Harvest Terrace  
West Perth  
WA 6005



NATA Accredited  
Accreditation Number 2377  
Site Number 2370

Accredited for compliance with ISO/IEC 17025 – Testing  
NATA is a signatory to the ILAC Mutual Recognition  
Arrangement for the mutual recognition of the  
equivalence of testing, medical testing, calibration,  
inspection, proficiency testing scheme providers and  
reference materials producers reports and certificates.

Attention:



**Report** 890781-S-V2  
Project name  
Project ID WA\_0960\_PFASOMP  
Received Date May 20, 2022

| Client Sample ID                                           |        |       | 0960_QC205_2<br>20517 | 0960_QC206_2<br>20517 | 0960_QC207_2<br>20517 | 0960_QC211_2<br>20518 |
|------------------------------------------------------------|--------|-------|-----------------------|-----------------------|-----------------------|-----------------------|
| Sample Matrix                                              |        |       | Soil                  | Soil                  | Soil                  | Soil                  |
| Eurofins Sample No.                                        |        |       | L22-<br>My0054072     | L22-<br>My0054073     | L22-<br>My0054074     | L22-<br>My0054078     |
| Date Sampled                                               |        |       | May 17, 2022          | May 17, 2022          | May 17, 2022          | May 18, 2022          |
| Test/Reference                                             | LOR    | Unit  |                       |                       |                       |                       |
| % Moisture                                                 | 1      | %     | 5.0                   | 19                    | 8.8                   | 23                    |
| <b>PFAS (Full Suite) Soil</b>                              |        |       |                       |                       |                       |                       |
| Perfluorobutanoic acid (PFBA)                              | 0.0008 | mg/kg | < 0.0008              | < 0.0008              | < 0.0008              | < 0.0008              |
| Perfluoropentanoic acid (PFPeA)                            | 0.0002 | mg/kg | < 0.0002              | < 0.0002              | < 0.0002              | < 0.0002              |
| Perfluorohexanoic acid (PFHxA)                             | 0.0004 | mg/kg | < 0.0004              | < 0.0004              | < 0.0004              | < 0.0004              |
| Perfluoroheptanoic acid (PFHpA)                            | 0.0008 | mg/kg | < 0.0008              | < 0.0008              | < 0.0008              | < 0.0008              |
| Perfluorooctanoic acid (PFOA)                              | 0.0002 | mg/kg | < 0.0002              | < 0.0002              | < 0.0002              | < 0.0002              |
| Perfluorononanoic acid (PFNA)                              | 0.0002 | mg/kg | < 0.0002              | < 0.0002              | < 0.0002              | < 0.0002              |
| Perfluorodecanoic acid (PFDA)                              | 0.0002 | mg/kg | < 0.0002              | < 0.0002              | < 0.0002              | < 0.0002              |
| Perfluoroundecanoic acid (PFUnDA)                          | 0.0002 | mg/kg | < 0.0002              | < 0.0002              | < 0.0002              | < 0.0002              |
| Perfluorododecanoic acid (PFDoDA)                          | 0.0002 | mg/kg | < 0.0002              | < 0.0002              | < 0.0002              | < 0.0002              |
| Perfluorotridecanoic acid (PFTTrDA)                        | 0.0002 | mg/kg | < 0.0002              | < 0.0002              | < 0.0002              | < 0.0002              |
| Perfluorotetradecanoic acid (PFTeDA)                       | 0.0002 | mg/kg | < 0.0002              | < 0.0002              | < 0.0002              | < 0.0002              |
| Perfluorobutane sulfonic acid (PFBS)                       | 0.0004 | mg/kg | < 0.0004              | < 0.0004              | < 0.0004              | < 0.0004              |
| Perfluoropentane sulfonic acid (PFPeS)                     | 0.0004 | mg/kg | < 0.0004              | < 0.0004              | < 0.0004              | < 0.0004              |
| Perfluorohexane sulfonic acid (PFHxS)                      | 0.0004 | mg/kg | 0.0006                | < 0.0004              | < 0.0004              | < 0.0004              |
| Perfluoroheptane sulfonic acid (PFHpS)                     | 0.0004 | mg/kg | < 0.0004              | < 0.0004              | < 0.0004              | < 0.0004              |
| Perfluorooctane sulfonic acid (PFOS)                       | 0.0004 | mg/kg | 0.0026                | < 0.0004              | < 0.0004              | < 0.0004              |
| Perfluorodecane sulfonic acid (PFDS)                       | 0.0004 | mg/kg | < 0.0004              | < 0.0004              | < 0.0004              | < 0.0004              |
| 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                  | 0.0005 | mg/kg | < 0.0005              | < 0.0005              | < 0.0005              | < 0.0005              |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                  | 0.0005 | mg/kg | 0.0007                | < 0.0005              | < 0.0005              | < 0.0005              |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                  | 0.0005 | mg/kg | < 0.0005              | < 0.0005              | < 0.0005              | < 0.0005              |
| 10:2 Fluorotelomer sulfonic acid (10:2 FTS)                | 0.0005 | mg/kg | < 0.0005              | < 0.0005              | < 0.0005              | < 0.0005              |
| Perfluorooctane sulfonamide (FOSA)                         | 0.0004 | mg/kg | < 0.0004              | < 0.0004              | < 0.0004              | < 0.0004              |
| N-Methyl perfluorooctane sulfonamide (Me-FOSA)             | 0.0004 | mg/kg | < 0.0004              | < 0.0004              | < 0.0004              | < 0.0004              |
| N-Ethyl perfluorooctane sulfonamide (Et-FOSA)              | 0.0004 | mg/kg | < 0.0004              | < 0.0004              | < 0.0004              | < 0.0004              |
| Perfluorooctane sulfonamidoacetic acid (FOSAA)             | 0.0004 | mg/kg | < 0.0004              | < 0.0004              | < 0.0004              | < 0.0004              |
| N-Methyl perfluorooctane sulfonamidoacetic acid (Me-FOSAA) | 0.0004 | mg/kg | < 0.0004              | < 0.0004              | < 0.0004              | < 0.0004              |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (Et-FOSAA)  | 0.0004 | mg/kg | < 0.0004              | < 0.0004              | < 0.0004              | < 0.0004              |
| N-Methyl perfluorooctane sulfonamidoethanol (N-Me-FOSE)    | 0.0008 | mg/kg | < 0.0008              | < 0.0008              | < 0.0008              | < 0.0008              |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-Et-FOSE)     | 0.0008 | mg/kg | < 0.0008              | < 0.0008              | < 0.0008              | < 0.0008              |
| Sum of PFAS                                                | 0.0002 | mg/kg | 0.0040                | < 0.0002              | < 0.0002              | < 0.0002              |

|                               |        |       |                                    |                                    |                                    |                                    |
|-------------------------------|--------|-------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| <b>Client Sample ID</b>       |        |       | <a href="#">0960_QC205_2 20517</a> | <a href="#">0960_QC206_2 20517</a> | <a href="#">0960_QC207_2 20517</a> | <a href="#">0960_QC211_2 20518</a> |
| <b>Sample Matrix</b>          |        |       | Soil                               | Soil                               | Soil                               | Soil                               |
| <b>Eurofins Sample No.</b>    |        |       | L22-My0054072                      | L22-My0054073                      | L22-My0054074                      | L22-My0054078                      |
| <b>Date Sampled</b>           |        |       | May 17, 2022                       | May 17, 2022                       | May 17, 2022                       | May 18, 2022                       |
| Test/Reference                | LOR    | Unit  |                                    |                                    |                                    |                                    |
| <b>PFAS (Full Suite) Soil</b> |        |       |                                    |                                    |                                    |                                    |
| Sum of PFHxS and PFOS         | 0.0004 | mg/kg | 0.0033                             | < 0.0004                           | < 0.0004                           | < 0.0004                           |
| Sum of PFAS (WA DER List)     | 0.0002 | mg/kg | 0.0040                             | < 0.0002                           | < 0.0002                           | < 0.0002                           |

|                                                            |        |       |                                    |
|------------------------------------------------------------|--------|-------|------------------------------------|
| <b>Client Sample ID</b>                                    |        |       | <a href="#">0960_QC212_2 20518</a> |
| <b>Sample Matrix</b>                                       |        |       | Soil                               |
| <b>Eurofins Sample No.</b>                                 |        |       | L22-My0054079                      |
| <b>Date Sampled</b>                                        |        |       | May 18, 2022                       |
| Test/Reference                                             | LOR    | Unit  |                                    |
|                                                            |        |       |                                    |
| % Moisture                                                 | 1      | %     | 12                                 |
| <b>PFAS (Full Suite) Soil</b>                              |        |       |                                    |
| Perfluorobutanoic acid (PFBA)                              | 0.0008 | mg/kg | < 0.0008                           |
| Perfluoropentanoic acid (PFPeA)                            | 0.0002 | mg/kg | < 0.0002                           |
| Perfluorohexanoic acid (PFHxA)                             | 0.0004 | mg/kg | < 0.0004                           |
| Perfluoroheptanoic acid (PFHpA)                            | 0.0008 | mg/kg | < 0.0008                           |
| Perfluorooctanoic acid (PFOA)                              | 0.0002 | mg/kg | < 0.0002                           |
| Perfluorononanoic acid (PFNA)                              | 0.0002 | mg/kg | < 0.0002                           |
| Perfluorodecanoic acid (PFDA)                              | 0.0002 | mg/kg | < 0.0002                           |
| Perfluoroundecanoic acid (PFUnDA)                          | 0.0002 | mg/kg | < 0.0002                           |
| Perfluorododecanoic acid (PFDoDA)                          | 0.0002 | mg/kg | < 0.0002                           |
| Perfluorotridecanoic acid (PFTTrDA)                        | 0.0002 | mg/kg | < 0.0002                           |
| Perfluorotetradecanoic acid (PFTeDA)                       | 0.0002 | mg/kg | < 0.0002                           |
| Perfluorobutane sulfonic acid (PFBS)                       | 0.0004 | mg/kg | < 0.0004                           |
| Perfluoropentane sulfonic acid (PFPeS)                     | 0.0004 | mg/kg | < 0.0004                           |
| Perfluorohexane sulfonic acid (PFHxS)                      | 0.0004 | mg/kg | < 0.0004                           |
| Perfluoroheptane sulfonic acid (PFHpS)                     | 0.0004 | mg/kg | < 0.0004                           |
| Perfluorooctane sulfonic acid (PFOS)                       | 0.0004 | mg/kg | < 0.0004                           |
| Perfluorodecane sulfonic acid (PFDS)                       | 0.0004 | mg/kg | < 0.0004                           |
| 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                  | 0.0005 | mg/kg | < 0.0005                           |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                  | 0.0005 | mg/kg | < 0.0005                           |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                  | 0.0005 | mg/kg | < 0.0005                           |
| 10:2 Fluorotelomer sulfonic acid (10:2 FTS)                | 0.0005 | mg/kg | < 0.0005                           |
| Perfluorooctane sulfonamide (FOSA)                         | 0.0004 | mg/kg | < 0.0004                           |
| N-Methyl perfluorooctane sulfonamide (Me-FOSA)             | 0.0004 | mg/kg | < 0.0004                           |
| N-Ethyl perfluorooctane sulfonamide (Et-FOSA)              | 0.0004 | mg/kg | < 0.0004                           |
| Perfluorooctane sulfonamidoacetic acid (FOSAA)             | 0.0004 | mg/kg | < 0.0004                           |
| N-Methyl perfluorooctane sulfonamidoacetic acid (Me-FOSAA) | 0.0004 | mg/kg | < 0.0004                           |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (Et-FOSAA)  | 0.0004 | mg/kg | < 0.0004                           |
| N-Methyl perfluorooctane sulfonamidoethanol (N-Me-FOSE)    | 0.0008 | mg/kg | < 0.0008                           |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-Et-FOSE)     | 0.0008 | mg/kg | < 0.0008                           |
| Sum of PFAS                                                | 0.0002 | mg/kg | < 0.0002                           |
| Sum of PFHxS and PFOS                                      | 0.0004 | mg/kg | < 0.0004                           |
| Sum of PFAS (WA DER List)                                  | 0.0002 | mg/kg | < 0.0002                           |

### 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<br>- Method: ARL135 Moisture in Solids                                                        | Welshpool    | May 23, 2022 | 14 Days      |
| PFAS (Full Suite) Soil<br>- Method: ARL511 - Per and Polyfluoroalkyl Substances in Soil/Sediment by LCMS | Welshpool    | Aug 03, 2022 | 28 Days      |

### Repeat Samples

| Description                                                                                              | Testing Site | Extracted    | Holding Time |
|----------------------------------------------------------------------------------------------------------|--------------|--------------|--------------|
| % Moisture<br>- Method: ARL135 Moisture in Solids                                                        | Welshpool    | May 23, 2022 | 14 Days      |
| PFAS (Full Suite) Soil<br>- Method: ARL511 - Per and Polyfluoroalkyl Substances in Soil/Sediment by LCMS | Welshpool    | Aug 03, 2022 | 28 Days      |

**Company Name:** Cardno (WA)  
**Address:** 11 Harvest Terrace  
West Perth  
WA 6005

**Project Name:**  
**Project ID:** WA\_0960\_PFASOMP

**Order No.:**  
**Report #:** 890781  
**Phone:** 08 9273 3888  
**Fax:** 08 9388 3831

**Received:** May 20, 2022 10:00 AM  
**Due:** May 27, 2022  
**Priority:** 5 Day  
**Contact Name:** [REDACTED]

**Eurofins Analytical Services Manager :** [REDACTED]

| Sample Detail                                  |                   |              |               |        |               | Moisture Set | PFAS (Full Suite) Water Std | PFAS (Full Suite) Soil |
|------------------------------------------------|-------------------|--------------|---------------|--------|---------------|--------------|-----------------------------|------------------------|
| Perth Laboratory - NATA # 2377 Site # 2370     |                   |              |               |        |               | X            | X                           | X                      |
| Melbourne Laboratory - NATA # 1261 Site # 1254 |                   |              |               |        |               |              |                             |                        |
| Sydney Laboratory - NATA # 1261 Site # 18217   |                   |              |               |        |               |              |                             |                        |
| Brisbane Laboratory - NATA # 1261 Site # 20794 |                   |              |               |        |               |              |                             |                        |
| Mayfield Laboratory - NATA # 1261 Site # 25079 |                   |              |               |        |               |              |                             |                        |
| External Laboratory                            |                   |              |               |        |               |              |                             |                        |
| No                                             | Sample ID         | Sample Date  | Sampling Time | Matrix | LAB ID        |              |                             |                        |
| 1                                              | 0960_QC205_220517 | May 17, 2022 |               | Soil   | L22-My0054072 | X            |                             | X                      |
| 2                                              | 0960_QC206_220517 | May 17, 2022 |               | Soil   | L22-My0054073 | X            |                             | X                      |
| 3                                              | 0960_QC207_220517 | May 17, 2022 |               | Soil   | L22-My0054074 | X            |                             | X                      |
| 4                                              | 0960_QC208_220517 | May 17, 2022 |               | Water  | L22-My0054075 |              | X                           |                        |
| 5                                              | 0960_QC209_220517 | May 17, 2022 |               | Water  | L22-My0054076 |              | X                           |                        |
| 6                                              | 0960_QC210_       | May 18, 2022 |               | Water  | L22-          |              | X                           |                        |

**Company Name:** Cardno (WA)  
**Address:** 11 Harvest Terrace  
West Perth  
WA 6005  
  
**Project Name:**  
**Project ID:** WA\_0960\_PFASOMP

**Order No.:**  
**Report #:** 890781  
**Phone:** 08 9273 3888  
**Fax:** 08 9388 3831

**Received:** May 20, 2022 10:00 AM  
**Due:** May 27, 2022  
**Priority:** 5 Day  
**Contact Name:** [REDACTED]

**Eurofins Analytical Services Manager :** [REDACTED]

| Sample Detail                                  |                   |              |  |      |               | Moisture Set | PFAS (Full Suite) Water Std | PFAS (Full Suite) Soil |
|------------------------------------------------|-------------------|--------------|--|------|---------------|--------------|-----------------------------|------------------------|
| Perth Laboratory - NATA # 2377 Site # 2370     |                   |              |  |      |               | X            | X                           | X                      |
| Melbourne Laboratory - NATA # 1261 Site # 1254 |                   |              |  |      |               |              |                             |                        |
| Sydney Laboratory - NATA # 1261 Site # 18217   |                   |              |  |      |               |              |                             |                        |
| Brisbane Laboratory - NATA # 1261 Site # 20794 |                   |              |  |      |               |              |                             |                        |
| Mayfield Laboratory - NATA # 1261 Site # 25079 |                   |              |  |      |               |              |                             |                        |
| External Laboratory                            |                   |              |  |      |               |              |                             |                        |
|                                                | 220518            |              |  |      | My0054077     |              |                             |                        |
| 7                                              | 0960_QC211_220518 | May 18, 2022 |  | Soil | L22-My0054078 | X            |                             | X                      |
| 8                                              | 0960_QC212_220518 | May 18, 2022 |  | Soil | L22-My0054079 | X            |                             | X                      |
| Test Counts                                    |                   |              |  |      |               | 5            | 3                           | 5                      |



## Internal Quality Control Review and Glossary

### General

1. 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.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. 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

|                                                  |                                           |                                                                          |
|--------------------------------------------------|-------------------------------------------|--------------------------------------------------------------------------|
| <b>mg/kg:</b> milligrams per kilogram            | <b>mg/L:</b> milligrams per litre         | <b>µg/L:</b> micrograms per litre                                        |
| <b>ppm:</b> parts per million                    | <b>ppb:</b> parts per billion             | <b>%:</b> Percentage                                                     |
| <b>org/100 mL:</b> Organisms per 100 millilitres | <b>NTU:</b> Nephelometric Turbidity Units | <b>MPN/100 mL:</b> Most Probable Number of organisms per 100 millilitres |

### Terms

|                         |                                                                                                                                                                                                                                                                                               |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>APHA</b>             | American Public Health Association                                                                                                                                                                                                                                                            |
| <b>COC</b>              | Chain of Custody                                                                                                                                                                                                                                                                              |
| <b>CP</b>               | Client Parent - QC was performed on samples pertaining to this report                                                                                                                                                                                                                         |
| <b>CRM</b>              | Certified Reference Material (ISO17034) - reported as percent recovery.                                                                                                                                                                                                                       |
| <b>Dry</b>              | Where a moisture has been determined on a solid sample the result is expressed on a dry basis.                                                                                                                                                                                                |
| <b>Duplicate</b>        | A second piece of analysis from the same sample and reported in the same units as the result to show comparison.                                                                                                                                                                              |
| <b>LOR</b>              | Limit of Reporting.                                                                                                                                                                                                                                                                           |
| <b>LCS</b>              | Laboratory Control Sample - reported as percent recovery.                                                                                                                                                                                                                                     |
| <b>Method Blank</b>     | 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.                                                                                                                                |
| <b>NCP</b>              | 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.                                                                                                                            |
| <b>RPD</b>              | Relative Percent Difference between two Duplicate pieces of analysis.                                                                                                                                                                                                                         |
| <b>SPIKE</b>            | Addition of the analyte to the sample and reported as percentage recovery.                                                                                                                                                                                                                    |
| <b>SRA</b>              | Sample Receipt Advice                                                                                                                                                                                                                                                                         |
| <b>Surr - Surrogate</b> | The addition of a like compound to the analyte target and reported as percentage recovery.                                                                                                                                                                                                    |
| <b>TBTO</b>             | 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. |
| <b>TCLP</b>             | Toxicity Characteristic Leaching Procedure                                                                                                                                                                                                                                                    |
| <b>TEQ</b>              | Toxic Equivalency Quotient or Total Equivalence                                                                                                                                                                                                                                               |
| <b>QSM</b>              | US Department of Defense Quality Systems Manual Version 5.4                                                                                                                                                                                                                                   |
| <b>US EPA</b>           | United States Environmental Protection Agency                                                                                                                                                                                                                                                 |
| <b>WA DWER</b>          | 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

1. 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.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

## Quality Control Results

| Test                                                       | Units | Result 1 |  |  | Acceptance Limits | Pass Limits | Qualifying Code |
|------------------------------------------------------------|-------|----------|--|--|-------------------|-------------|-----------------|
| <b>Method Blank</b>                                        |       |          |  |  |                   |             |                 |
| <b>PFAS (Full Suite) Soil</b>                              |       |          |  |  |                   |             |                 |
| Perfluorobutanoic acid (PFBA)                              | mg/kg | < 0.0008 |  |  | 0.0008            | Pass        |                 |
| Perfluoropentanoic acid (PFPeA)                            | mg/kg | < 0.0002 |  |  | 0.0002            | Pass        |                 |
| Perfluorohexanoic acid (PFHxA)                             | mg/kg | < 0.0004 |  |  | 0.0004            | Pass        |                 |
| Perfluoroheptanoic acid (PFHpA)                            | mg/kg | < 0.0008 |  |  | 0.0008            | Pass        |                 |
| Perfluorooctanoic acid (PFOA)                              | mg/kg | < 0.0002 |  |  | 0.0002            | Pass        |                 |
| Perfluorononanoic acid (PFNA)                              | mg/kg | < 0.0002 |  |  | 0.0002            | Pass        |                 |
| Perfluorodecanoic acid (PFDA)                              | mg/kg | < 0.0002 |  |  | 0.0002            | Pass        |                 |
| Perfluoroundecanoic acid (PFUnDA)                          | mg/kg | < 0.0002 |  |  | 0.0002            | Pass        |                 |
| Perfluorododecanoic acid (PFDoDA)                          | mg/kg | < 0.0002 |  |  | 0.0002            | Pass        |                 |
| Perfluorotridecanoic acid (PFTTrDA)                        | mg/kg | < 0.0002 |  |  | 0.0002            | Pass        |                 |
| Perfluorotetradecanoic acid (PFTeDA)                       | mg/kg | < 0.0002 |  |  | 0.0002            | Pass        |                 |
| Perfluorobutane sulfonic acid (PFBS)                       | mg/kg | < 0.0004 |  |  | 0.0004            | Pass        |                 |
| Perfluoropentane sulfonic acid (PFPeS)                     | mg/kg | < 0.0004 |  |  | 0.0004            | Pass        |                 |
| Perfluorohexane sulfonic acid (PFHxS)                      | mg/kg | < 0.0004 |  |  | 0.0004            | Pass        |                 |
| Perfluoroheptane sulfonic acid (PFHpS)                     | mg/kg | < 0.0004 |  |  | 0.0004            | Pass        |                 |
| Perfluorooctane sulfonic acid (PFOS)                       | mg/kg | < 0.0004 |  |  | 0.0004            | Pass        |                 |
| Perfluorodecane sulfonic acid (PFDS)                       | mg/kg | < 0.0004 |  |  | 0.0004            | Pass        |                 |
| 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                  | mg/kg | < 0.0005 |  |  | 0.0005            | Pass        |                 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                  | mg/kg | < 0.0005 |  |  | 0.0005            | Pass        |                 |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                  | mg/kg | < 0.0005 |  |  | 0.0005            | Pass        |                 |
| 10:2 Fluorotelomer sulfonic acid (10:2 FTS)                | mg/kg | < 0.0005 |  |  | 0.0005            | Pass        |                 |
| Perfluorooctane sulfonamide (FOSA)                         | mg/kg | < 0.0004 |  |  | 0.0004            | Pass        |                 |
| N-Methyl perfluorooctane sulfonamide (Me-FOSA)             | mg/kg | < 0.0004 |  |  | 0.0004            | Pass        |                 |
| N-Ethyl perfluorooctane sulfonamide (Et-FOSA)              | mg/kg | < 0.0004 |  |  | 0.0004            | Pass        |                 |
| Perfluorooctane sulfonamidoacetic acid (FOSAA)             | mg/kg | < 0.0004 |  |  | 0.0004            | Pass        |                 |
| N-Methyl perfluorooctane sulfonamidoacetic acid (Me-FOSAA) | mg/kg | < 0.0004 |  |  | 0.0004            | Pass        |                 |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (Et-FOSAA)  | mg/kg | < 0.0004 |  |  | 0.0004            | Pass        |                 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-Me-FOSE)    | mg/kg | < 0.0008 |  |  | 0.0008            | Pass        |                 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-Et-FOSE)     | mg/kg | < 0.0008 |  |  | 0.0008            | Pass        |                 |
| Sum of PFAS                                                | mg/kg | < 0.0002 |  |  | 0.0002            | Pass        |                 |
| Sum of PFHxS and PFOS                                      | mg/kg | < 0.0004 |  |  | 0.0004            | Pass        |                 |
| Sum of PFAS (WA DER List)                                  | mg/kg | < 0.0002 |  |  | 0.0002            | Pass        |                 |
| <b>LCS - % Recovery</b>                                    |       |          |  |  |                   |             |                 |
| <b>PFAS (Full Suite) Soil</b>                              |       |          |  |  |                   |             |                 |
| Perfluorobutanoic acid (PFBA)                              | %     | 115      |  |  | 50-130            | Pass        |                 |
| Perfluoropentanoic acid (PFPeA)                            | %     | 116      |  |  | 50-130            | Pass        |                 |
| Perfluorohexanoic acid (PFHxA)                             | %     | 112      |  |  | 50-130            | Pass        |                 |
| Perfluorooctanoic acid (PFOA)                              | %     | 109      |  |  | 50-130            | Pass        |                 |
| Perfluorononanoic acid (PFNA)                              | %     | 107      |  |  | 50-130            | Pass        |                 |
| Perfluorodecanoic acid (PFDA)                              | %     | 109      |  |  | 50-130            | Pass        |                 |
| Perfluoroundecanoic acid (PFUnDA)                          | %     | 117      |  |  | 50-130            | Pass        |                 |
| Perfluorododecanoic acid (PFDoDA)                          | %     | 104      |  |  | 50-130            | Pass        |                 |
| Perfluorotridecanoic acid (PFTTrDA)                        | %     | 106      |  |  | 50-130            | Pass        |                 |
| Perfluorotetradecanoic acid (PFTeDA)                       | %     | 104      |  |  | 50-130            | Pass        |                 |
| Perfluorobutane sulfonic acid (PFBS)                       | %     | 117      |  |  | 50-130            | Pass        |                 |
| Perfluoropentane sulfonic acid (PFPeS)                     | %     | 109      |  |  | 50-130            | Pass        |                 |
| Perfluorohexane sulfonic acid (PFHxS)                      | %     | 96       |  |  | 50-130            | Pass        |                 |
| Perfluoroheptane sulfonic acid (PFHpS)                     | %     | 108      |  |  | 50-130            | Pass        |                 |
| Perfluorooctane sulfonic acid (PFOS)                       | %     | 116      |  |  | 50-130            | Pass        |                 |
| Perfluorodecane sulfonic acid (PFDS)                       | %     | 108      |  |  | 50-130            | Pass        |                 |

| Test                                                       |               |           | Units | Result 1 |          |     | Acceptance Limits | Pass Limits | Qualifying Code |
|------------------------------------------------------------|---------------|-----------|-------|----------|----------|-----|-------------------|-------------|-----------------|
| 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                  |               |           | %     | 109      |          |     | 50-130            | Pass        |                 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                  |               |           | %     | 111      |          |     | 50-130            | Pass        |                 |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                  |               |           | %     | 107      |          |     | 50-130            | Pass        |                 |
| Perfluorooctane sulfonamide (FOSA)                         |               |           | %     | 115      |          |     | 50-130            | Pass        |                 |
| N-Methyl perfluorooctane sulfonamidoacetic acid (Me-FOSAA) |               |           | %     | 107      |          |     | 50-130            | Pass        |                 |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (Et-FOSAA)  |               |           | %     | 115      |          |     | 50-130            | Pass        |                 |
| Test                                                       | Lab Sample ID | QA Source | Units | Result 1 |          |     | Acceptance Limits | Pass Limits | Qualifying Code |
| <b>Duplicate</b>                                           |               |           |       |          |          |     |                   |             |                 |
| <b>PFAS (Full Suite) Soil</b>                              |               |           |       | Result 1 | Result 2 | RPD |                   |             |                 |
| Perfluorobutanoic acid (PFBA)                              | L22-My0067800 | NCP       | mg/kg | < 0.0008 | < 0.0008 | <1  | 30%               | Pass        |                 |
| Perfluoropentanoic acid (PFPeA)                            | L22-My0067800 | NCP       | mg/kg | < 0.0002 | < 0.0002 | <1  | 30%               | Pass        |                 |
| Perfluorohexanoic acid (PFHxA)                             | L22-My0067800 | NCP       | mg/kg | < 0.0004 | < 0.0004 | <1  | 30%               | Pass        |                 |
| Perfluoroheptanoic acid (PFHpA)                            | L22-My0067800 | NCP       | mg/kg | < 0.0008 | < 0.0008 | <1  | 30%               | Pass        |                 |
| Perfluorooctanoic acid (PFOA)                              | L22-My0067800 | NCP       | mg/kg | < 0.0002 | < 0.0002 | <1  | 30%               | Pass        |                 |
| Perfluorononanoic acid (PFNA)                              | L22-My0067800 | NCP       | mg/kg | < 0.0002 | < 0.0002 | <1  | 30%               | Pass        |                 |
| Perfluorodecanoic acid (PFDA)                              | L22-My0067800 | NCP       | mg/kg | < 0.0002 | < 0.0002 | <1  | 30%               | Pass        |                 |
| Perfluoroundecanoic acid (PFUnDA)                          | L22-My0067800 | NCP       | mg/kg | < 0.0002 | < 0.0002 | <1  | 30%               | Pass        |                 |
| Perfluorododecanoic acid (PFDoDA)                          | L22-My0067800 | NCP       | mg/kg | < 0.0002 | < 0.0002 | <1  | 30%               | Pass        |                 |
| Perfluorotridecanoic acid (PFTriDA)                        | L22-My0067800 | NCP       | mg/kg | < 0.0002 | < 0.0002 | <1  | 30%               | Pass        |                 |
| Perfluorotetradecanoic acid (PFTeDA)                       | L22-My0067800 | NCP       | mg/kg | < 0.0002 | < 0.0002 | <1  | 30%               | Pass        |                 |
| Perfluorobutane sulfonic acid (PFBS)                       | L22-My0067800 | NCP       | mg/kg | < 0.0004 | < 0.0004 | <1  | 30%               | Pass        |                 |
| Perfluoropentane sulfonic acid (PFPeS)                     | L22-My0067800 | NCP       | mg/kg | < 0.0004 | < 0.0004 | <1  | 30%               | Pass        |                 |
| Perfluorohexane sulfonic acid (PFHxS)                      | L22-My0067800 | NCP       | mg/kg | < 0.0004 | < 0.0004 | <1  | 30%               | Pass        |                 |
| Perfluoroheptane sulfonic acid (PFHpS)                     | L22-My0067800 | NCP       | mg/kg | < 0.0004 | < 0.0004 | <1  | 30%               | Pass        |                 |
| Perfluorooctane sulfonic acid (PFOS)                       | L22-My0067800 | NCP       | mg/kg | < 0.0004 | < 0.0004 | <1  | 30%               | Pass        |                 |
| Perfluorodecane sulfonic acid (PFDS)                       | L22-My0067800 | NCP       | mg/kg | < 0.0004 | < 0.0004 | <1  | 30%               | Pass        |                 |
| 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                  | L22-My0067800 | NCP       | mg/kg | < 0.0005 | < 0.0005 | <1  | 30%               | Pass        |                 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                  | L22-My0067800 | NCP       | mg/kg | < 0.0005 | < 0.0005 | <1  | 30%               | Pass        |                 |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                  | L22-My0067800 | NCP       | mg/kg | < 0.0005 | < 0.0005 | <1  | 30%               | Pass        |                 |
| 10:2 Fluorotelomer sulfonic acid (10:2 FTS)                | L22-My0067800 | NCP       | mg/kg | < 0.0005 | < 0.0005 | <1  | 30%               | Pass        |                 |
| Perfluorooctane sulfonamide (FOSA)                         | L22-My0067800 | NCP       | mg/kg | < 0.0004 | < 0.0004 | <1  | 30%               | Pass        |                 |
| N-Methyl perfluorooctane sulfonamide (Me-FOSA)             | L22-My0067800 | NCP       | mg/kg | < 0.0004 | < 0.0004 | <1  | 30%               | Pass        |                 |
| N-Ethyl perfluorooctane sulfonamide (Et-FOSA)              | L22-My0067800 | NCP       | mg/kg | < 0.0004 | < 0.0004 | <1  | 30%               | Pass        |                 |
| Perfluorooctane sulfonamidoacetic acid (FOSAA)             | L22-My0067800 | NCP       | mg/kg | < 0.0004 | < 0.0004 | <1  | 30%               | Pass        |                 |
| N-Methyl perfluorooctane sulfonamidoacetic acid (Me-FOSAA) | L22-My0067800 | NCP       | mg/kg | < 0.0004 | < 0.0004 | <1  | 30%               | Pass        |                 |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (Et-FOSAA)  | L22-My0067800 | NCP       | mg/kg | < 0.0004 | < 0.0004 | <1  | 30%               | Pass        |                 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-Me-FOSE)    | L22-My0067800 | NCP       | mg/kg | < 0.0008 | < 0.0008 | <1  | 30%               | Pass        |                 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-Et-FOSE)     | L22-My0067800 | NCP       | mg/kg | < 0.0008 | < 0.0008 | <1  | 30%               | Pass        |                 |

| Test                          | Lab Sample ID | QA Source | Units | Result 1 | Result 2 | RPD | Acceptance Limits | Pass Limits | Qualifying Code |
|-------------------------------|---------------|-----------|-------|----------|----------|-----|-------------------|-------------|-----------------|
| <b>Duplicate</b>              |               |           |       |          |          |     |                   |             |                 |
| <b>PFAS (Full Suite) Soil</b> |               |           |       | Result 1 | Result 2 | RPD |                   |             |                 |
| Sum of PFAS                   | L22-My0067800 | NCP       | mg/kg | < 0.0002 | < 0.0002 | <1  | 30%               | Pass        |                 |
| Sum of PFHxS and PFOS         | L22-My0067800 | NCP       | mg/kg | < 0.0004 | < 0.0004 | <1  | 30%               | Pass        |                 |
| Sum of PFAS (WA DER List)     | L22-My0067800 | NCP       | mg/kg | < 0.0002 | < 0.0002 | <1  | 30%               | Pass        |                 |
| <b>Duplicate</b>              |               |           |       |          |          |     |                   |             |                 |
|                               |               |           |       | Result 1 | Result 2 | RPD |                   |             |                 |
| % Moisture                    | L22-My0054073 | CP        | %     | 19       | 19       | 3.0 | 30%               | Pass        |                 |

## Comments

V2 report issued following re-analysis of samples on client request.

## Sample Integrity

|                                                                         |     |
|-------------------------------------------------------------------------|-----|
| Custody Seals Intact (if used)                                          | N/A |
| Attempt to Chill was evident                                            | Yes |
| Sample correctly preserved                                              | Yes |
| Appropriate sample containers have been used                            | Yes |
| Sample containers for volatile analysis received with minimal headspace | Yes |
| Samples received within HoldingTime                                     | Yes |
| Some samples have been subcontracted                                    | No  |

## Authorised by:

|                                                                                   |                                  |
|-----------------------------------------------------------------------------------|----------------------------------|
|  | Analytical Services Manager      |
|  | Senior Analyst-PFAS              |
| Sean Sangster                                                                     | Senior Analyst-Sample Properties |



  
**Business Unit Manager**

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

\* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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## APPENDIX

# D

FIELD RECORDS & CALIBRATION CERTIFICATES

Table D1 - Surface water Field Records

| Site           | Monitoring Location ID | Date       | Sample ID         | Sampling Method    | Sample Depth (m) | WaterBody Depth (m) | Flow Rate | Comments   | Temp (°C) | DO (mg/L) | EC (us/Cm) | TDS (mg/L) | pH   | Eh (mV) | Water Colour | Turbidity | Parameter Comments     |
|----------------|------------------------|------------|-------------------|--------------------|------------------|---------------------|-----------|------------|-----------|-----------|------------|------------|------|---------|--------------|-----------|------------------------|
| RAAF Learmonth | SW001                  | 18/05/2022 | 0960_SW001_220518 | Direct into Bottle | 0.1              | 0.4                 | Slow      |            | 21.2      | 4.27      | 59727      | 38805      | 8.07 | 90      |              | Low       |                        |
| RAAF Learmonth | SW157                  | 17/05/2022 | 0960_SW157_220517 | Direct into Bottle | 0.1              | 0.2                 | Slow      |            | 23.9      | 6.31      | 8317       | 5408       |      | 148.9   | Clear        | Low       |                        |
| RAAF Learmonth | SW170                  | 17/05/2022 | 0960_SW170_220517 | Direct into Bottle | 0.1              | 0.5                 | Slow      |            | 21        | 4.65      | 593        | 383.5      |      | 195     | Clear        | Low       | PH probe faulty        |
| RAAF Learmonth | SW189                  | 17/05/2022 | 0960_SW189_220517 | Direct into Bottle | 0.1              | 0.5                 | Slow      |            | 21.8      | 4.98      | 4307       | 4322       |      | 199.2   | Clear        | Low       | Wrong pH               |
| RAAF Learmonth | SW190                  | 17/05/2022 | 0960_SW190_220517 | Direct into Bottle | 0.1              | 0.8                 | Slow      |            | 22        | 5.51      | 5554       | 3607       |      | 207.7   |              | Low       | PH probe faulty        |
| RAAF Learmonth | SW192                  | 18/05/2022 | 0960_SW192_220518 | Direct into Bottle | 0.1              | 0.5                 | Slow      |            | 17.3      | 5.49      | 40893      | 26585      | 8.14 | 101.9   | clear        | Low       |                        |
| RAAF Learmonth | SW193                  | 18/05/2022 | 0960_SW193_220518 | Direct into Bottle | 0.1              | 0.3                 | Slow      | QC110, 210 | 17.3      | 5.26      | 41281      | 26832      | 8.09 | 98.5    | clear        | Low       |                        |
| RAAF Learmonth | SW199                  | 17/05/2022 |                   |                    |                  |                     |           | Dry        |           |           |            |            |      |         |              |           |                        |
| RAAF Learmonth | SW200                  | 17/05/2022 |                   |                    |                  |                     |           | Dry        |           |           |            |            |      |         |              |           |                        |
| RAAF Learmonth | SW205                  | 17/05/2022 | 0960_SW205_220517 | Direct into Bottle | 0.05             | 0.1                 | Slow      |            | 24.1      | 4.85      | 57152      | 37245      |      | 131     | Clear        | Low       |                        |
| RAAF Learmonth | SW207                  | 18/05/2022 | 0960_SW207_220518 | Direct into Bottle | 0.1              | 0.5                 | Slow      |            | 22.8      | 4.42      | 55291      | 35945      | 8.12 | 115.6   | clear        | Low       |                        |
| RAAF Learmonth | SW208                  | 17/05/2022 | 0960_SW208_220517 | Direct into Bottle | 0.1              | 3                   | Fast      |            | 21.8      | 4.08      | 55049      | 35815      |      | 146.9   | clear        | Low       | PH reading looks wrong |
| RAAF Learmonth | SW209                  | 18/05/2022 | 0960_SW209_220518 | Direct into Bottle | 0.1              | 0.5                 | Slow      |            | 22        | 2.51      | 55102      | 35815      | 7.81 | 121.1   | clear        | Low       |                        |
| RAAF Learmonth | SW210                  | 18/05/2022 | 0960_SW210_220518 | Direct into Bottle | 0.1              | 0.5                 | Slow      |            | 22.3      | 3.83      | 54509      | 35425      | 7.88 | 117.8   | clear        | Low       |                        |
| RAAF Learmonth | SW211                  | 18/05/2022 | 0960_SW211_220518 | Direct into Bottle | 0.1              | 0.5                 | Slow      |            | 21.1      | 4.73      | 53854      | 35002.5    | 8.02 | 108.7   | clear        | Low       |                        |
| RAAF Learmonth | SW219                  | 17/05/2022 | 0960_SW219_220517 | Direct into Bottle | 0.1              | 0.2                 | Slow      |            | 25.3      | 4.7       | 367.5      | 238        |      | 157.6   | Cloudy       | Medium    | PH reading looks wrong |
| RAAF Learmonth | SW265                  | 17/05/2022 | 0960_SW265_220517 | Direct into Bottle | 0.1              | 0.2                 | Slow      |            | 21.2      | 5.14      | 6188       | 4023.5     |      | 155     | Clear        | Low       | PH reading looks wrong |
| RAAF Learmonth | SW288                  | 18/05/2022 | 0960_SW288_220518 | Direct into Bottle | 0.1              | 0.3                 | Slow      |            | 20.2      | 4.04      | 52884      | 34417.5    | 8.11 | 97.8    | clear        | Low       |                        |
| RAAF Learmonth | SW298                  | 17/05/2022 | 0960_SW298_220517 | Direct into Bottle | 0.1              | 0.5                 | Slow      | QC108, 208 | 25.4      | 4.1       | 60054      | 39000      |      | 180.6   | clear        | Low       |                        |
| RAAF Learmonth | SW300                  | 18/05/2022 | 0960_SW300_220518 | Direct into Bottle | 0.1              | 0.3                 | Slow      |            | 22        | 8.81      | 56593      | 36790      | 8.2  | 99.3    | clear        | Low       |                        |
| RAAF Learmonth | SW301                  | 17/05/2022 | 0960_SW301_220517 | Direct into Bottle | 0.1              | 0.15                | Slow      |            | 24.5      | 4.48      | 59151      | 38480      | 7.78 | 60.3    | Clear        | Low       |                        |
| RAAF Learmonth | SW302                  | 18/05/2022 | 0960_SW302_220518 | Direct into Bottle | 0.1              | 0.5                 | Slow      |            | 21.1      | 3.02      | 55446      | 36010      | 7.83 | 117.9   | clear        | Low       |                        |
| RAAF Learmonth | SW303                  | 18/05/2022 | 0960_SW303_220518 | Direct into Bottle | 0.1              | 0.6                 | Slow      |            | 21.4      | 2.14      | 55447      | 36075      | 7.78 | 66      | clear        | Low       |                        |
| RAAF Learmonth | SW304                  | 18/05/2022 | 0960_SW304_220518 | Direct into Bottle | 0.1              | 0.6                 | Slow      |            | 22.2      | 3.4       | 55303      | 35945      | 7.83 | 60.9    | clear        | Low       |                        |
| RAAF Learmonth | SW305                  | 18/05/2022 | 0960_SW305_220518 | Direct into Bottle | 0.1              | 0.4                 | Slow      |            | 20.6      | 3.16      | 54529      | 35444.5    | 7.83 | 113.6   | clear        | Low       |                        |



Table D2 - Sediment Field Records

| Site           | Monitoring Location ID | Date       | Sample ID         | Depth of Sediment Sampling (m) | Sampling Method | Sample Condition | Sample Description            | Comments   |
|----------------|------------------------|------------|-------------------|--------------------------------|-----------------|------------------|-------------------------------|------------|
| RAAF Learmonth | SD199                  | 17/05/2022 | 0960_SD199_220517 | 0.1                            | Trowel          | Dry              | reddy brown clay              |            |
| RAAF Learmonth | SD200                  | 17/05/2022 | 0960_SD200_220517 | 0.1                            | Trowel          | Dry              | reddy brown sandy clay        | QC107, 207 |
| RAAF Learmonth | SD205                  | 17/05/2022 | 0960_SD205_220517 | 0.1                            | Trowel          | Wet              | reddy brown sandy clay        |            |
| RAAF Learmonth | SD207                  | 18/05/2022 | 0960_SD207_220518 | 0.1                            | Trowel          | Wet              | Sandy clay. dk brown          |            |
| RAAF Learmonth | SD208                  | 17/05/2022 | 0960_SD208_220517 | 0.1                            | Trowel          | Wet              | white yellow sand             |            |
| RAAF Learmonth | SD209                  | 18/05/2022 | 0960_SD209_220518 | 0.1                            | Trowel          | Wet              | Brown sandy clay              |            |
| RAAF Learmonth | SD210                  | 18/05/2022 | 0960_SD210_220518 | 0.1                            | Trowel          | Wet              | Sandy clay                    |            |
| RAAF Learmonth | SD211                  | 18/05/2022 | 0960_SD211_220518 | 0.1                            | Trowel          | Wet              | Brown clay                    |            |
| RAAF Learmonth | SD219                  | 17/05/2022 | 0960_SD219_220517 | 0.1                            | Trowel          | Wet              | reddy brown clay              |            |
| RAAF Learmonth | SD300                  | 18/05/2022 | 0960_SD300_220518 | 0.1                            | Trowel          | Wet              | Brown clay                    |            |
| RAAF Learmonth | SD301                  | 18/05/2022 | 0960_SD301_220518 | 0.1                            | Trowel          | Wet              | Brown clay                    |            |
| RAAF Learmonth | SD302                  | 18/05/2022 | 0960_SD302_220518 | 0.1                            | Trowel          | Wet              | Dk brown sandy clay           |            |
| RAAF Learmonth | SD303                  | 18/05/2022 | 0960_SD303_220518 | 0.1                            | Trowel          | Wet              | Dk brown clayey sand          |            |
| RAAF Learmonth | SD304                  | 18/05/2022 | 0960_SD304_220518 | 0.1                            | Trowel          | Wet              | Brown coarse sand             |            |
| RAAF Learmonth | SD305                  | 18/05/2022 | 0960_SD305_220518 | 0.1                            | Trowel          | Wet              | Brown coarse sand             |            |
| RAAF Learmonth | SS108                  | 17/05/2022 | 0960_SS108_220517 | 0.1                            | Trowel          | Dry              | reddy brown clay              |            |
| RAAF Learmonth | SS113                  | 17/05/2022 | 0960_SS113_220517 | 0.1                            | Trowel          | Dry              | Orange clay with some gravels |            |
| RAAF Learmonth | SS114                  | 17/05/2022 | 0960_SS114_220517 | 0.1                            | Trowel          | Dry              | reddy brown clay              |            |
| RAAF Learmonth | SS121                  | 17/05/2022 | 0960_SS121_220517 | 0.1                            | Trowel          | Dry              | reddy brown clay              |            |
| RAAF Learmonth | SS122                  | 17/05/2022 | 0960_SS122_220517 | 0.1                            | Trowel          | Dry              | reddy brown clay              | QC105, 205 |
| RAAF Learmonth | SS123                  | 17/05/2022 | 0960_SS123_220517 | 0.1                            | Trowel          | Dry              | Orange clay                   |            |
| RAAF Learmonth | SS124                  | 17/05/2022 | 0960_SS124_220517 | 0.1                            | Trowel          | Dry              | Orange clay                   |            |
| RAAF Learmonth | SS125                  | 17/05/2022 | 0960_SS125_220517 | 0.1                            | Trowel          | Dry              | Orange clay                   |            |
| RAAF Learmonth | SS157                  | 17/05/2022 | 0960_SS157_220517 | 0.1                            | Trowel          | Wet              | reddy brown, gravelly clay    |            |
| RAAF Learmonth | SS166                  | 17/05/2022 | 0960_SS166_220517 | 0.1                            | Trowel          | Dry              | Orange clay                   |            |
| RAAF Learmonth | SS168                  | 17/05/2022 | 0960_SS168_220517 | 0.1                            | Trowel          | Dry              | Orange clay                   |            |
| RAAF Learmonth | SS170                  | 17/05/2022 | 0960_SS170_220517 | 0.1                            | Trowel          | Wet              | reddy brown, gravelly clay    |            |
| RAAF Learmonth | SS174                  | 17/05/2022 | 0960_SS174_220517 | 0.1                            | Trowel          | Dry              | reddy brown, gravelly clay    |            |
| RAAF Learmonth | SS176                  | 17/05/2022 | 0960_SS176_220517 | 0.1                            | Trowel          | Dry              | Orange clay                   |            |
| RAAF Learmonth | SS189                  | 17/05/2022 | 0960_SS189_220517 | 0.1                            | Trowel          | Wet              | reddy brown clay              |            |
| RAAF Learmonth | SS190                  | 17/05/2022 | 0960_SS190_220517 | 0.1                            | Trowel          | Wet              | reddy brown clay              |            |
| RAAF Learmonth | SS192                  | 18/05/2022 | 0960_SS192_220518 | 0.1                            | Trowel          | Wet              | Brown coarse sand             |            |
| RAAF Learmonth | SS193                  | 18/05/2022 | 0960_SS193_220518 | 0.1                            | Trowel          | Wet              | Coarse brown sand             | QC111/211  |
| RAAF Learmonth | SS198                  | 18/05/2022 | 0960_SS198_220518 | 0.1                            | Trowel          | Dry              | Brown sand                    | QC112/212  |
| RAAF Learmonth | SS227                  | 17/05/2022 | 0960_SS227_220517 | 0.1                            | Trowel          | Dry              | Orange sandy clay             |            |
| RAAF Learmonth | SS231                  | 17/05/2022 | 0960_SS231_220517 | 0.1                            | Trowel          | Dry              | reddy brown clay              |            |
| RAAF Learmonth | SS234                  | 17/05/2022 | 0960_SS234_220517 | 0.1                            | Trowel          | Dry              | reddy brown clay              |            |
| RAAF Learmonth | SS235                  | 17/05/2022 | 0960_SS235_220517 | 0.1                            | Trowel          | Dry              | Orange clay                   |            |
| RAAF Learmonth | SS243                  | 17/05/2022 | 0960_SS243_220517 | 0.1                            | Trowel          | Dry              | reddy brown, gravelly clay    |            |
| RAAF Learmonth | SS265                  | 17/05/2022 | 0960_SS265_220517 | 0.1                            | Trowel          | Wet              | reddy brown, gravelly clay    | QC106, 206 |
| RAAF Learmonth | SS277                  | 17/05/2022 | 0960_SS277_220517 | 0.1                            | Trowel          | Dry              | Orange clay                   |            |
| RAAF Learmonth | SS278                  | 17/05/2022 | 0960_SS278_220517 | 0.1                            | Trowel          | Dry              | reddy brown, clay             |            |
| RAAF Learmonth | SS279                  | 17/05/2022 | 0960_SS279_220517 | 0.1                            | Trowel          | Dry              | Orange clay                   |            |
| RAAF Learmonth | SS288                  | 18/05/2022 | 0960_SS288_220518 | 0.1                            | Trowel          | Wet              | Brown fine sand               |            |
| RAAF Learmonth | SS291                  | 17/05/2022 | 0960_SS291_220517 | 0.1                            | Trowel          | Dry              | reddy brown clay              |            |
| RAAF Learmonth | SS292                  | 18/05/2022 | 0960_SS292_220518 | 0.1                            | Trowel          | Dry              | reddy brown clay              |            |
| RAAF Learmonth | SS293                  | 18/05/2022 | 0960_SS293_220518 | 0.1                            | Trowel          | Dry              | Brown sand                    |            |
| RAAF Learmonth | SS298                  | 17/05/2022 | 0960_SS298_220517 | 0.1                            | Trowel          | Wet              | reddy brown sandy clay        |            |
| RAAF Learmonth | SS301                  | 17/05/2022 | 0960_SS301_220517 | 0.1                            | Trowel          | Wet              | reddy brown, sandy clay       |            |

**Note:** ‘SS’ indicates a shallow soil (dry) location, ‘SD’ indicates a sediment (wet) location based on the condition on the first time the location was sampled.



## Calibration Report

### Multi-Parameter Water Quality Instrument

Customer:

Contact:

Manufacturer: YSI

Instrument: Professional Plus with Quatro cable

Serial #: 20J100956

Cable length: 1m 20J100101

| Item                                                     | Test                         | Pass | Comments                                             |
|----------------------------------------------------------|------------------------------|------|------------------------------------------------------|
| Battery                                                  | 2 x Alkaline C-cells         | ✓    | Voltage reading above 2.9V                           |
|                                                          | Battery Saver                | ✓    | Automatically turns off after 30 minutes if not used |
| Connections                                              | Condition                    | ✓    | Good, clean                                          |
| Cable                                                    | Condition                    | ✓    | Clean, no tears                                      |
| Display                                                  | Operation                    | ✓    |                                                      |
| Firmware                                                 | Version                      | ✓    | 4.0.0                                                |
| Keypad                                                   | Operational                  | ✓    |                                                      |
| Display                                                  | Screen                       | ✓    |                                                      |
| Unit                                                     | Condition, seals and O-rings | ✓    |                                                      |
| Monitor housing                                          | Condition                    | ✓    |                                                      |
| <b>pH</b>                                                |                              |      |                                                      |
| Condition                                                |                              | ✓    | Good, clean                                          |
| pH millivolts for pH7 calibration range                  | 0 mV ± 50 mV                 | ✓    |                                                      |
| pH 4 mV range + 165 to + 180 from 7 buffer mV value      |                              | ✓    | 173.40 mV                                            |
| pH slope                                                 |                              | ✓    | 55 to 60 mV/pH, ideal 59mV 58.72                     |
| Response time < 90 seconds                               |                              | ✓    |                                                      |
| Calibrated and conforms to manufacturer's specifications |                              | ✓    |                                                      |
| <b>ORP</b>                                               |                              |      |                                                      |
| Condition                                                |                              | ✓    | Good, clean                                          |
| Response time < 90 seconds                               |                              | ✓    |                                                      |
| within ± 80mv of reference Zobell Reading                |                              | ✓    |                                                      |
| Calibrated and conforms to manufacturer's specifications |                              | ✓    | variance range ± 20mV 4 mV                           |
| <b>Conductivity</b>                                      |                              |      |                                                      |
| Condition                                                |                              | ✓    | Good, clean                                          |
| Temperature                                              |                              | ✓    | °C                                                   |
| Conductivity cell constant                               | 5.0 ± 1.0 in GLP file        | ✓    |                                                      |
| Clean sensor reads less than 3 uS/cm in dry air          |                              | ✓    |                                                      |
| Calibrated and conforms to manufacturer's specifications |                              | ✓    | µs/cm                                                |
| <b>Dissolved Oxygen</b>                                  |                              |      |                                                      |
| Condition                                                |                              | ✓    | Good, clean                                          |
| DO sensor in use                                         |                              | ✓    | Galvanic                                             |
| 1.25 mil PE membrane (yellow membrane):                  |                              | ✓    |                                                      |
| DO Sensor Value                                          |                              | ✓    | (min 4.31 uA - max 8.00 uA) Avg 6.15 uA              |
| Calibrated and conforms to manufacturer's specifications |                              | ✓    | ppm                                                  |

This is to certify that the above instrument has been calibrated to the following specifications:

| Parameter                | Standards                | Reference | Calibration Point | Span   | Units | Instrument Readings |       |       |
|--------------------------|--------------------------|-----------|-------------------|--------|-------|---------------------|-------|-------|
|                          |                          |           |                   |        |       | Before              | After | Units |
| Temperature              | Check Temp NATA          | Room Temp | 18.2              | -0.9   | °C    | NA                  | 17.3  | °C    |
| pH (21K)                 | pH 7.00                  | 375757    | 7.01              | -6.00  | mV    | 7.04                | 7.01  | pH    |
| pH (21K)                 | pH 4.00                  | 378281    | 4.00              | 167.40 | mV    | 4.02                | 4.00  | pH    |
| Conductivity (20H100492) | 2764 µs/cm at 25°C       | 21/1012   | 2764              | GLP    | 4.94  | 2766                | 2764  | µs/cm |
| ORP (201013SIA605102)    | Zobell A & B             | 21/1611   | 246               | 246    | mV    | 244.8               | 242   | mV    |
| Zero DO (20H100658)      | NaSO3 in distilled water | 10175     | 0.0               | NA     | NA    | 0.1                 | 0.0   | %     |
| 100% DO (20H100658)      | 100% Air Saturation      | Air       | 100.0             | 4.7    | uA    | 102.3               | 100.0 | %     |

Calibrated by: Gaurav Kanwar

Calibration Date: 07-May-22

Next Due: 03-Nov-22



## Calibration Report

### Multi-Parameter Water Quality Instrument

Customer:

Contact:

Manufacturer: YSI

Instrument: Professional Plus with Quatro cable

Serial #: 20D101039

Cable length: 1m 20A100403

| Item                                                     | Test                         | Pass | Comments                                             |
|----------------------------------------------------------|------------------------------|------|------------------------------------------------------|
| Battery                                                  | 2 x Alkaline C-cells         | ✓    | Voltage reading above 2.9V                           |
|                                                          | Battery Saver                | ✓    | Automatically turns off after 30 minutes if not used |
| Connections                                              | Condition                    | ✓    | Good, clean                                          |
| Cable                                                    | Condition                    | ✓    | Clean, no tears                                      |
| Display                                                  | Operation                    | ✓    |                                                      |
| Firmware                                                 | Version                      | ✓    | 4.0.0                                                |
| Keypad                                                   | Operational                  | ✓    |                                                      |
| Display                                                  | Screen                       | ✓    |                                                      |
| Unit                                                     | Condition, seals and O-rings | ✓    |                                                      |
| Monitor housing                                          | Condition                    | ✓    |                                                      |
| <b>pH</b>                                                |                              |      |                                                      |
| Condition                                                |                              | ✓    | Good, clean                                          |
| pH millivolts for pH7 calibration range                  | 0 mV ± 50 mV                 | ✓    |                                                      |
| pH 4 mV range + 165 to + 180 from 7 buffer mV value      |                              | ✓    | 171.70 mV                                            |
| pH slope                                                 |                              | ✓    | 55 to 60 mV/pH, ideal 59mV 58.14                     |
| Response time < 90 seconds                               |                              | ✓    |                                                      |
| Calibrated and conforms to manufacturer's specifications |                              | ✓    |                                                      |
| <b>ORP</b>                                               |                              |      |                                                      |
| Condition                                                |                              | ✓    | Good, clean                                          |
| Response time < 90 seconds                               |                              | ✓    |                                                      |
| within ± 80mv of reference Zobell Reading                |                              | ✓    |                                                      |
| Calibrated and conforms to manufacturer's specifications |                              | ✓    | variance range ± 20mV 4 mV                           |
| <b>Conductivity</b>                                      |                              |      |                                                      |
| Condition                                                |                              | ✓    | Good, clean                                          |
| Temperature                                              |                              | ✓    | °C                                                   |
| Conductivity cell constant                               | 5.0 ± 1.0 in GLP file        | ✓    |                                                      |
| Clean sensor reads less than 3 uS/cm in dry air          |                              | ✓    |                                                      |
| Calibrated and conforms to manufacturer's specifications |                              | ✓    | µs/cm                                                |
| <b>Dissolved Oxygen</b>                                  |                              |      |                                                      |
| Condition                                                |                              | ✓    | Good, clean                                          |
| DO sensor in use                                         |                              | ✓    | Galvanic                                             |
| 1.25 mil PE membrane (yellow membrane):                  |                              | ✓    |                                                      |
| DO Sensor Value                                          |                              | ✓    | (min 4.31 uA - max 8.00 uA) Avg 6.15 uA              |
| Calibrated and conforms to manufacturer's specifications |                              | ✓    | ppm                                                  |

This is to certify that the above instrument has been calibrated to the following specifications:

| Parameter                | Standards                | Reference | Calibration Point | Span   | Units | Instrument Readings |       |       |
|--------------------------|--------------------------|-----------|-------------------|--------|-------|---------------------|-------|-------|
|                          |                          |           |                   |        |       | Before              | After | Units |
| Temperature (11H100544)  | Check Temp NATA          | Room Temp | 18.2              | -1     | °C    | NA                  | 17.2  | °C    |
| pH (21K)                 | pH 7.00                  | 375757    | 7.01              | -4.10  | mV    | 7.07                | 7.01  | pH    |
| pH (21K)                 | pH 4.00                  | 378281    | 4.00              | 167.60 | mV    | 4.07                | 4.00  | pH    |
| Conductivity (11H100544) | 2764 µs/cm at 25°C       | 21/1012   | 2764              | GLP    | 4.83  | 2718                | 2764  | µs/cm |
| ORP (2004085IA605101)    | Zobell A & B             | 21/1611   | 246               | 246    | mV    | 243.2               | 242.1 | mV    |
| Zero DO (20B140053)      | NaSO3 in distilled water | 10175     | 0.0               | NA     | NA    | 0.4                 | 0.0   | %     |
| 100% DO (20B140053)      | 100% Air Saturation      | Air       | 100.0             | 4.6    | uA    | 94.2                | 100.0 | %     |

Calibrated by: Gaurav Kanwar

Calibration Date: 07-May-22

Next Due: 03-Nov-22

| Date of Bump Test | Site ID      | Unit Brand/ Model | Ambient Air Oxygen Calibration | Zero % Oxygen Solution Calibration | Standard Concentrations                                          | Ambient Temperature (°C) | Bump Test Reading                            | Bump Test Readings within ±5%?                                                   | Comment | Test by (Name) | (Signature)                                                                         |
|-------------------|--------------|-------------------|--------------------------------|------------------------------------|------------------------------------------------------------------|--------------------------|----------------------------------------------|----------------------------------------------------------------------------------|---------|----------------|-------------------------------------------------------------------------------------|
| 16/5/22           | 0082<br>0083 | YSI #200101039    | 100% Saturation? Y N           | 0% Calibration? Y N NA             | pH 4.00 Y / N<br>pH 7.00 Y / N<br>EC: 1,413µS/cm Y / N<br>35,000 |                          | pH 4.00: 4.09<br>pH 7.00: 7.08<br>EC: 34640  | pH 4.00: (± pH 0.2) Y / N<br>pH 7.00: (± pH 0.2) Y / N<br>EC: (± 150µS/cm) Y / N |         | MG             |  |
| 17/05/22          | 0960         | YSI #200101039    | 100% Saturation? Y N           | 0% Calibration? Y N NA             | pH 4.00 Y / N<br>pH 7.00 Y / N<br>EC: 1,413µS/cm Y / N<br>35,000 |                          | pH 4.00: -2.12<br>pH 7.00: 7.15<br>EC: 34663 | pH 4.00: (± pH 0.2) Y / N<br>pH 7.00: (± pH 0.2) Y / N<br>EC: (± 150µS/cm) Y / N |         | MB             |                                                                                     |
| 18/05/22          | 0960         | YSI #200101039    | 100% Saturation? Y N           | 0% Calibration? Y N NA             | pH 4.00 Y / N<br>pH 7.00 Y / N<br>EC: 1,413µS/cm Y / N<br>35,000 |                          | pH 4.00: 4.11<br>pH 7.00: 7.06<br>EC: 34753  | pH 4.00: (± pH 0.2) Y / N<br>pH 7.00: (± pH 0.2) Y / N<br>EC: (± 150µS/cm) Y / N |         | MG             |  |
|                   |              | YSI #             | 100% Saturation? Y N           | 0% Calibration? Y N NA             | pH 4.00 Y / N<br>pH 7.00 Y / N<br>EC: 1,413µS/cm Y / N           |                          | pH 4.00:<br>pH 7.00:<br>Temp:<br>EC:         | pH 4.00: (± pH 0.2) Y / N<br>pH 7.00: (± pH 0.2) Y / N<br>EC: (± 150µS/cm) Y / N |         |                |                                                                                     |
|                   |              | YSI #             | 100% Saturation? Y N           | 0% Calibration? Y N NA             | pH 4.00 Y / N<br>pH 7.00 Y / N<br>EC: 1,413µS/cm Y / N           |                          | pH 4.00:<br>pH 7.00:<br>Temp:<br>EC:         | pH 4.00: (± pH 0.2) Y / N<br>pH 7.00: (± pH 0.2) Y / N<br>EC: (± 150µS/cm) Y / N |         |                |                                                                                     |
|                   |              | YSI #             | 100% Saturation? Y N           | 0% Calibration? Y N NA             | pH 4.00 Y / N<br>pH 7.00 Y / N<br>EC: 1,413µS/cm Y / N           |                          | pH 4.00:<br>pH 7.00:<br>Temp:<br>EC:         | pH 4.00: (± pH 0.2) Y / N<br>pH 7.00: (± pH 0.2) Y / N<br>EC: (± 150µS/cm) Y / N |         |                |                                                                                     |
|                   |              | YSI #             | 100% Saturation? Y N           | 0% Calibration? Y N NA             | pH 4.00 Y / N<br>pH 7.00 Y / N<br>EC: 1,413µS/cm Y / N           |                          | pH 4.00:<br>pH 7.00:<br>Temp:<br>EC:         | pH 4.00: (± pH 0.2) Y / N<br>pH 7.00: (± pH 0.2) Y / N<br>EC: (± 150µS/cm) Y / N |         |                |                                                                                     |
|                   |              | YSI #             | 100% Saturation? Y N           | 0% Calibration? Y N NA             | pH 4.00 Y / N<br>pH 7.00 Y / N<br>EC: 1,413µS/cm Y / N           |                          | pH 4.00:<br>pH 7.00:<br>Temp:<br>EC:         | pH 4.00: (± pH 0.2) Y / N<br>pH 7.00: (± pH 0.2) Y / N<br>EC: (± 150µS/cm) Y / N |         |                |                                                                                     |

APPENDIX

# E

DATA QUALITY REVIEW

## Data Quality Review

### PFAS OMP First Flush monitoring event

This appendix reviews the Quality Assurance (QA) and Quality Control (QC) documentation. Quality assurance encompasses the actions, procedures, checks and decisions undertaken to ensure sample integrity and representativeness, and the reliability and accuracy of analysis results. The QA documentation should also include an indication of the Data Quality Objectives sought in relation to each significant action, test or process involved in the assessment.

QC activities measure the effectiveness of the QA procedures by undertaking testing, and then comparing results to previously established objectives. QC work will include the internal laboratory testing as well as results of QC samples submitted such as field blanks and duplicates. The quality of the information and/or data is deemed satisfactory when the QC results demonstrate that agreed objectives have been met.

| QA/QC Aspects                                                     | Evidence & Evaluation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>QA Documentation</b>                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Project Quality Plan/Work Plan and Data Quality Objectives</b> | <p>The field investigation was carried out on 17-18 May 2022 and is generally in accordance with the proposed scope of work, as documented in the SAQP (ref DEF19009_RAAF Learmonth_SAQP_Rev5) issued to the client and in general compliance with the Australian standards AS 4482.1- 2005 “<i>Guide to Sampling and Investigation of Potentially Contaminated Soil, Part 1: Non-volatile and Semi-volatile Compounds</i>”, Standards Australia 1998. AS/NZ 5667:1998 <i>Water quality – sampling</i> and NEPM “<i>National Environment Protection (Assessment of Site Contamination) Measure</i>”.</p> <p>A quality control program was implemented during the Investigation and the quality assurance procedures used have been reiterated in the report (DEF19009_First Flush 2022 OMP Factual Report_RAAF Learmonth). In addition, a Health, Safety and Environment Work Method Statement (HSEWMS) was also prepared.</p> <p>The Data Quality Objectives were expressed in terms of the purpose of the assessment and the relevant assessment criteria.</p> |
| <b>Data Representativeness</b>                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Use of Composites</b>                                          | No Composites were used during the investigation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Holding Times</b>                                              | Chain of custody and laboratory reports provide evidence of holding times. Holding times were compliant with required timeframes.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Background samples</b>                                         | No background samples were collected as part of this investigation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Verification of field procedures</b>                           | <p>The methodology conducted during this investigation is documented in the body of the report, and was in general conformance with the SAQP.</p> <p>Non-disposable equipment was decontaminated between sample locations.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |



| QA/QC Aspects                                                                                                 |                                                                                                                                                                                                                                                     | Evidence & Evaluation                  |                                           |
|---------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|-------------------------------------------|
| Data Precision & Accuracy                                                                                     |                                                                                                                                                                                                                                                     |                                        |                                           |
| QC sample Frequency                                                                                           | QC sample type                                                                                                                                                                                                                                      | SAQP required frequency                | Sample Collected                          |
|                                                                                                               | Blind duplicate                                                                                                                                                                                                                                     | 1 in 10 primary water samples (10%)    | 3 for 23 primary water samples (13.0%)    |
|                                                                                                               |                                                                                                                                                                                                                                                     | 1 in 10 primary sediment samples (10%) | 5 for 49 primary sediment samples (10.2%) |
|                                                                                                               | Interlab duplicate                                                                                                                                                                                                                                  | 1 in 10 primary water samples (10%)    | 3 for 23 primary water samples (13.0%)    |
|                                                                                                               |                                                                                                                                                                                                                                                     | 1 in 10 primary sediment samples (10%) | 5 for 49 primary sediment samples (10.2%) |
| Rinsate                                                                                                       | 1 per day / equipment used                                                                                                                                                                                                                          | 2 for 2 day (100%)                     |                                           |
| Field Blank                                                                                                   | 1 per day / field team (esky)                                                                                                                                                                                                                       | 2 for 2 day (100%)                     |                                           |
| QC sample frequency was compliant with the SAQP for water and sediment duplicates, rinsates and field blanks. |                                                                                                                                                                                                                                                     |                                        |                                           |
| RPD acceptance criteria                                                                                       | Magnitude of Results                                                                                                                                                                                                                                |                                        | Acceptable RPD range                      |
|                                                                                                               | < 10 x LOR                                                                                                                                                                                                                                          |                                        | No limits                                 |
|                                                                                                               | 10 – 20 LOR                                                                                                                                                                                                                                         |                                        | 0% - 50%                                  |
|                                                                                                               | > 20 x LOR                                                                                                                                                                                                                                          |                                        | 0% - 20%                                  |
| QC Testing – Blind Duplicates (Primary Lab)                                                                   | Surface water                                                                                                                                                                                                                                       |                                        |                                           |
|                                                                                                               | <ul style="list-style-type: none"><li>Number of primary samples analysed: 23</li><li>Duplicate samples analysed: 3</li></ul> All RPDs were within acceptable range.                                                                                 |                                        |                                           |
| QC Testing – Blind Duplicates (Primary Lab)                                                                   | Sediment                                                                                                                                                                                                                                            |                                        |                                           |
|                                                                                                               | <ul style="list-style-type: none"><li>Number of primary samples analysed: 49</li><li>Duplicate samples analysed: 5</li></ul> All RPDs were within acceptable range.                                                                                 |                                        |                                           |
| QC Testing – Interlab Duplicates (Secondary Lab)                                                              | Surface water                                                                                                                                                                                                                                       |                                        |                                           |
|                                                                                                               | <ul style="list-style-type: none"><li>Number of primary samples Analysed: 23</li><li>Interlab Duplicates Samples Analysed: 3</li></ul> All RPDs were below acceptable range.                                                                        |                                        |                                           |
| QC Testing – Interlab Duplicates (Secondary Lab)                                                              | Sediment                                                                                                                                                                                                                                            |                                        |                                           |
|                                                                                                               | <ul style="list-style-type: none"><li>Number of primary samples analysed: 49</li><li>Interlab Duplicates Samples Analysed: 5</li></ul> QC212 recorded one RPD exceedance for PFOS.                                                                  |                                        |                                           |
| QC Testing – Interlab Duplicates (Secondary Lab)                                                              | Laboratory results between samples QC205 and QC207 had been swapped by the secondary laboratory. A request for confirmatory analysis was made. The laboratory confirmed the mistake and re-issued a corrected report.                               |                                        |                                           |
|                                                                                                               | QC205 recorded one minor RPD exceedance for the Sum of PFOS and PFHxS (31%). This is attributed to the difference of methodologies between the primary and secondary laboratories.                                                                  |                                        |                                           |
| Field Blanks                                                                                                  | Field Blanks were collected at a rate of one per field team (esky) per fieldwork day. All field blank samples tested reported analytes below the laboratory limit of reporting.                                                                     |                                        |                                           |
| Laboratory Internal QC                                                                                        | Evidence of the laboratories internal QC testing is present and complete in the reports. ALS (Primary) performed internal QC with adequate testing and satisfactory results for method blank, laboratory control samples and laboratory duplicates. |                                        |                                           |



| QA/QC Aspects                                 | Evidence & Evaluation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                               | <p>All Matrix Spikes reported recoveries within the acceptable range with exception of the following:</p> <ul style="list-style-type: none"> <li>EP2206832 <ul style="list-style-type: none"> <li>Sample ID: SS176 - PFOS MS recovery not determined due to background level greater than or equal to 4x spike level.</li> </ul> </li> <li>EP2205970 <ul style="list-style-type: none"> <li>Sample ID: SW288 - Sulfate MS recovery not determined due to background level greater than or equal to 4x spike level.</li> </ul> </li> </ul> <p>All Method Blank results were within acceptable range.</p> <p>All Quality Control sample frequencies were of an acceptable rate with exception of the following:</p> <ul style="list-style-type: none"> <li>EP2205925, EP2205970 <ul style="list-style-type: none"> <li>Matrix Spikes and Lab duplicates for PFAS were undertaken less than the target rate.</li> </ul> </li> <li>EP2205969 <ul style="list-style-type: none"> <li>Lab duplicates for moisture content was undertaken less than the target rate.</li> </ul> </li> </ul> |
| <b>Laboratory Method Detection Limit</b>      | Laboratory reports indicate the method detection limits were generally lower than the respective assessment criteria.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>NATA endorsement of laboratory reports</b> | <p>Laboratory reports were stamped with the NATA endorsement stamp and signature.</p> <p>ALS Accreditation No. 825</p> <p>Eurofins Accreditation No. 1261</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Calibration of Field Equipment</b>         | <p>All equipment used during the investigation was calibrated by the supplier prior to use.</p> <p>The equipment calibration certificates are provided in Appendix D.</p> <p>Cardno undertook in-field calibration checks (bump tests) for each YSI water quality meters per day of sampling. The bump tests found all parameters to be within the acceptable range with the exception of the pH parameter.</p> <p>Cardno is satisfied that the equipment calibrations were acceptable for this assessment. pH was not recorded for some samples due to an apparent faulty probe.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Decontamination and Equipment Blanks</b>   | Rinsate blanks were collected at a rate of one per day when reusable equipment is used (i.e. YSI, dipper, trowels/shovels...). All rinsate samples tested reported analytes concentrations below the laboratory LORs.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Data Comparability</b>                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Standard Procedures</b>                    | Fieldwork procedures are detailed in the SAQP and reports and are comparable for each phase of Investigation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Qualified Personnel</b>                    | Staff involved in managing and reviewing the project and those involved in fieldwork are qualified personnel.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Sample Integrity</b>                       | Field Chain of Custody/Laboratory request forms can be found in Appendix C.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Data Completeness</b>                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Completeness of test program</b>           | The scope of work undertaken was generally consistent with the SAQP.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Validity of Data Set</b>                   | The data quality review indicates no significant systematic errors in the data collection process for groundwater and therefore, the data set used as the basis for the investigation is considered valid and complete.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

# PFAS OMP Biannual Monitoring Event Factual Report

June 2022

RAAF Learmonth

304700525



Prepared for  
Department of Defence

10 October 2022

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now

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

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## Chemical Names

|       |                                            |
|-------|--------------------------------------------|
| DOC   | Dissolved Organic Carbon                   |
| DO    | Dissolved Oxygen                           |
| PFAS  | Per- and Poly-fluoroalkyl Substances       |
| PFHxS | Per-fluoro-hexane Sulphonate               |
| PFOA  | Per-fluoro-octanoic Acid                   |
| PFOS  | Per-fluoro-octane Sulfonate                |
| TDS   | Total Dissolved Solids (salinity of water) |
| TOC   | Total Organic Carbon                       |
| TSS   | Total Suspended Solids                     |

## Technical Terms

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

## Units

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

## Site Specific

|      |                           |
|------|---------------------------|
| OMP  | Ongoing Monitoring Plan   |
| FTG  | Fire Training Ground      |
| RAAF | Royal Australian Airforce |



# 1 Introduction

## 1.1 Background

Cardno now Stantec (“Cardno”) was engaged by the Australian Department of Defence (“Defence” or “the Client”) to carry out the Per- and Poly-Fluoroalkyl Substances (PFAS) Ongoing Monitoring Plan (OMP) biannual monitoring event at the Royal Australian Airforce (RAAF) Learmonth (“the site”). The site is located approximately 30 km south of Exmouth, Western Australia (WA) (Figure 1, Appendix A).

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

- > Cardno, June 2022, Reference: DEF19009, ‘PFAS Ongoing Monitoring Plan Sampling and Analysis Quality Plan (SAQP) RAAF Base Learmonth’. Rev 6

The SAQP was reviewed prior to the monitoring event and the following update was made:

- > Replacement of lost monitoring well MW016 by adjacent suitable well MW238.

For the purposes of this report:

- > “the site” was defined as RAAF Base Learmonth.
- > the “Management Area” was defined as comprising the site, plus the land east of the Base, including the salt pan, drainage channels, Wapet Creek and extends to Exmouth Gulf (Figure 2, Appendix A).

## 1.2 Purpose & Objectives

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

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

The objectives of the report are:

- > To provide a succinct summary of the June 2022 monitoring event and provision of analytical results with supporting tables and figures.
- > To provide confirmation of the current understanding of risk.
- > To provide supporting data for the assessment of management actions, where relevant.

## 1.3 Relevant Guidelines

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

- > National Environment Protection Council (NEPC), 1999, National Environmental Protection (Assessment of Site Contamination) Measure (as amended 2013) (ASC NEPM).
- > Heads of Environmental Protection Authority’s Australia and New Zealand (HEPA), January 2020, PFAS National Environmental Management Plan (NEMP) 2.0.
- > Australian Standard AS 4482-2005 Guide to the investigation and sampling of sites with potentially contaminated soils, Part 1 - Non-volatile and semi-volatile compounds.
- > Standards Australia 1998. AS/NZ 5667:1998 Water quality – sampling.
- > Australian and New Zealand Guidelines, 2018. Australian and New Zealand Guidelines for Fresh and Marine Water Quality.

- > Department of Water and Environmental Regulation (DWER), 2021, Assessment and Management of Contaminated Sites<sup>1</sup>.
- > Department of Defence, Department of Energy, 2018, Quality System Manual Schedule B15.
- > U.S. Environmental Protection Agency (EPA), 2000, 'Guidance for the Data Quality Objectives Process (EPA QA/G-4)'.
- > USEPA, 2002, 'Guidance on Environmental Data Verification and Data Validation (EPA QA/G-8)'.
- > National Health and Medical Research Council (NHMRC), August 2019, Guidance on Per and Polyfluoroalkyl Substances (PFAS) in Recreational Water.

## 2 Scope of Work

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

### 2.1 Groundwater Monitoring

Sampling of selected groundwater wells was generally performed in accordance with the SAQP, applying methods set out in Section 3 of this report. The groundwater wells monitored as part of the OMP are presented in Table 2-1, and are shown on Figure 4, Appendix A.

Table 2-1 Groundwater Monitoring Locations

| Monitoring Area                  | Location ID                                                                                                                                               |
|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Source Area 1 – Maintenance Area | MW018, MW021, MW112, MW113, MW114, MW115, MW162, MW163, MW164, MW165, MW166, MW167, MW168, MW211, MW233.                                                  |
| Source Area 2 – Fuel Farm        | MW105, MW148D, MW148S, MW151, MW159, MW238.                                                                                                               |
| Pathway                          | MW102, MW103, MW104, MW122, MW124, MW126, MW127, MW134, MW135, MW138, MW139, MW140, MW143, MW144, MW145, MW146, MW147, MW170, MW172, MW175, MW180, MW181. |
| Receptor                         | MW137, MW141, MW176, MW177, MW178, MW179.                                                                                                                 |

### 2.2 Seepage Water Monitoring

Sampling of selected seepage water monitoring locations was performed in accordance with the SAQP, applying methods set out in section 3 of this report. The seepage water locations monitored as part of the OMP are presented in Table 2-2 and are shown on Figure 4, Appendix A.

Table 2-2 Seepage Water Monitoring Locations

| Monitoring Area | Location ID                                     |
|-----------------|-------------------------------------------------|
| Seepage         | OTH103, OTH106, OTH107, OTH129, OTH132, OTH134. |

### 2.3 Surface water Monitoring

Sampling of selected surface water monitoring locations was performed in accordance with the SAQP, applying methods set out in Section 3 of this report. The surface water locations monitored as part of the OMP are presented in Table 2-3 and are shown on Figure 5, Appendix A.

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

Table 2-3 Surface water Monitoring Locations

| Monitoring Area   | Location ID                                                                                                                                                                                                                                                 |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Drainage channels | SW219, SW234, SW235, SW114, SW113, SW231, SW157, SW265, SW189, SW190, SW288, SW193, SW192, SW198, SW293, SS292, SW291, SW227, SW108, SW170, SW168, SW279, SW166, SW243, SW174, SW121, SW122, SW124, SW277, SW125, SW278, SW176, SW123, SW199, SW200, SW298. |
| WAPET Creek       | SW211, SW300, SW210, SW001, SW302, SW303, SW209, SW304, SW305, SW207, SW208, SW205, SW301.                                                                                                                                                                  |

## 2.4 Sediment Monitoring

Sampling of selected sediment (or shallow soil if dry) monitoring locations was performed in accordance with the SAQP, applying methods set out in Section 3 of this report. The sediment locations monitored as part of the OMP are presented in Table 2-4 and are shown on Figure 6, Appendix A.

Table 2-4 Sediment Monitoring Locations

| Monitoring Area   | Location ID                                                                                                                                                                                                                                                 |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Drainage channels | SD219, SS234, SS235, SS114, SS113, SS231, SS157, SS265, SS189, SS190, SS288, SS193, SS192, SS198, SS293, SS292, SS291, SS227, SS108, SS170, SS168, SS279, SS166, SS243, SS174, SS121, SS122, SS124, SS277, SS125, SS278, SS176, SS123, SD199, SD200, SS298. |
| WAPET Creek       | SD211, SD300, SD210, SD301, SD302, SD303, SD209, SD304, SD305, SD207, SD208, SD205, SS301.                                                                                                                                                                  |

**Note:** 'SS' prefix indicates a shallow soil (dry) location, 'SD' prefix a sediment (wet) location

## 2.5 Data Management

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

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

## 2.6 Deviations from the OMP SAQP

Deviations from the SAQP (Cardno, June 2022) for the June 2022 monitoring event are presented in Table 2-5.

Table 2-5 Summary of deviations from the OMP SAQP

| Location                                                                                                       | Deviation                                | Comments                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------------------------------|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SW113, SW124, SW125, SW166, SW168, SW174, SW176, SW198, SW231, SW234, SW235, SW243, SW277, SW278, SW279, SW292 | Not sampled                              | These surface water monitoring locations were found dry. No impact on the OMP – These locations have never been sampled for surface water as always been dry (sediment samples collected and analysed for PFAS)                         |
| SW114, SW121, SW122, SW123, SW219, SW291, SW293                                                                | Not sampled                              | These surface water monitoring locations were found dry. Limited impact on the OMP (sediment sample collected and analysed for PFAS)                                                                                                    |
| MW103                                                                                                          | Not sampled                              | No access due to area flooded. Limited impact on the OMP, no data collected for June 2022.                                                                                                                                              |
| All groundwater monitoring locations                                                                           | Water quality meter not placed down-hole | To prevent risks of cross contamination of the monitoring wells, the water quality parameters were taken from water collected from the hydraSleeves rather than placing the water quality meter inside the wells. No impact on the OMP. |

## 3 Methodology

### 3.1 Groundwater Sampling Methodology

Groundwater monitoring was undertaken applying the methods detailed in Table 3-1.

Table 3-1 Groundwater Sampling Method

| Activity                                                                       | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Well Gauging                                                                   | Standing Water Level (SWL) were gauged using an interface probe. All wells were measured against a surveyed mark at the top of the well casing.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Groundwater Field Parameters                                                   | <p>Groundwater field parameters were recorded via a quality meter prior to deployment of Hydrasleeves® or pre-sample collection. The following field parameters were recorded using a water quality meter:</p> <ul style="list-style-type: none"> <li>pH.</li> <li>electrical conductivity (EC).</li> <li>oxidation reduction potential (ORP).</li> <li>Dissolved oxygen (DO).</li> <li>Temperature.</li> </ul> <p>Once field parameters have stabilised (as indicated by at least three consecutive measurements falling within +/- 10% of each other) measurement were recorded on field data records.</p> <p>All field instruments (e.g. water quality meter) were calibrated by the equipment supplier and reading of reference solutions (bump tests) undertaken daily in the field to optimise the accuracy of the measurements taken. Calibration certificates and bump tests records are provided in Appendix D.</p> |
| Deployment and Retrieval of Hydrasleeves (single level well sample collection) | <p>Hydrasleeve were deployed with top weight sample collection to begin at the lowest point. Hydrasleeve sampling devices were left in wells for a minimum of 24 hours to allow restabilisation of the well following the slight disturbance caused by sampler deployment.</p> <p>Samples were collected via continuous pull method at a rate allowing the water to pass through the check valve into the sample sleeve.</p> <p>Samples were discharged immediately (minimise changes in chemistry) via discharge tube.</p> <p>Following sampling, hydrasleeves were deployed in preparation for the next OMP monitoring event using the same string for consistency between event (same depth of sampling i.e. within screen).</p>                                                                                                                                                                                          |
| Peristaltic pump (multi-level wells sample collection)                         | <p>The shallowest (non-dry) screen intervals were sampled at each multi-level well location, using Teflon-free dedicated and disposable high-density polyethylene (HDPE) tubing coupled to a peristaltic pump system. The groundwater was purged at a low flow rate of 0.2 mL/min.</p> <p>SWL and field parameters were measured during purging and post sample collection to ensure limited drawdown effects. The groundwater was sampled when the field parameters had stabilised.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Decontamination procedure                                                      | <p>Dedicated Hydrasleeves/tubing were used at each groundwater well thus removing the need for decontamination.</p> <p>All re-usable sampling equipment was thoroughly washed using PFAS &amp; phosphate-free detergent, then double rinsed with clean water before the sample collection.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Sample identification, preservation transport and holding times                | <p>Each sample was labelled with the sample location, date, project identification number and sampler's initials.</p> <p>Samples were collected directly into appropriately preserved laboratory supplied bottles (Teflon-free) and packed in chilled containers for delivery to the laboratory under Chain of Custody (CoC) documentation.</p> <p>Sample containers, preservation procedures, sample storage requirements and holding times were undertaken in accordance with those recommended by Standards Australia (AS/NZS 5667.1:1998 and AS 4482.1 as appropriate).</p>                                                                                                                                                                                                                                                                                                                                              |
| Laboratory Testing                                                             | Groundwater samples were submitted for the following analysis:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

| Activity                             | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                      | <ul style="list-style-type: none"> <li>Full PFAS analytical suite (refer to the SAQP for full list of analytes).</li> <li>Major anions and cations (include calcium, magnesium, sodium, potassium, chloride, sulfate, alkalinity and ionic balance).</li> </ul> <p>The primary laboratory was ALS Global Laboratories (Perth), and the secondary laboratory (quality control) was Eurofins ARL (Perth). Both laboratories are NATA-accredited for the parameters tested. Copies of the NATA stamped laboratory reports and Chain of Custody documentation are included in Appendix C.</p> |
| Laboratory Testing – Quality Control | <p>Groundwater QC samples were collected at the following frequencies as detailed in the SAQP (Cardno, 2022):</p> <ul style="list-style-type: none"> <li>Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch is less than 10 samples.</li> <li>Field triplicate (inter-laboratory) samples at 1 per 10 water samples and sent to a secondary laboratory.</li> <li>Rinsate blank sample at 1 per day [collected off re-used sampling equipment (e.g. interface probe)].</li> <li>Field blank samples at 1 per day.</li> </ul>                 |

### 3.2 Seepage Water Sampling Methodology

Seepage water monitoring procedure is detailed in Table 3-2.

Table 3-2 Seepage water Sampling method

| Activity                                                        | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Field parameters                                                | <p>The following field parameters were recorded using a water quality meter:</p> <ul style="list-style-type: none"> <li>pH.</li> <li>electrical conductivity (EC).</li> <li>oxidation reduction potential (ORP).</li> <li>Dissolved oxygen (DO).</li> <li>Temperature.</li> </ul> <p>Field observations such as water flow, odours or sheen presence were also recorded on field sampling sheets.</p>                                                                                                                                                        |
| Sampling Method                                                 | <p>Sampling was carried out in a two-hour period; one hour each side of the low tide. Sampling protocol involved a shallow excavation in the beach sand; just above where inundation by wave action is occurring.</p> <p>Sampling containers were lowered into the exposed seepage water and filled.</p>                                                                                                                                                                                                                                                     |
| Decontamination procedure                                       | <p>All re-usable sampling equipment was thoroughly washed using PFAS &amp; phosphate-free detergent, then double rinsed with clean water before the sample collection.</p>                                                                                                                                                                                                                                                                                                                                                                                   |
| Sample identification, preservation transport and holding times | <p>Each sample was labelled with the sample location, date, project identification number and sampler's initials.</p> <p>Samples were collected directly into appropriately preserved laboratory supplied bottles (Teflon-free) and packed in chilled containers for delivery to the laboratory under CoC documentation.</p> <p>Sample containers, preservation procedures, sample storage requirements and holding times were undertaken in accordance with those recommended by Standards Australia (AS/NZS 5667.1:1998 and AS 4482.1 as appropriate).</p> |
| Laboratory Testing                                              | <p>Seepage water samples were submitted for the following analysis:</p> <ul style="list-style-type: none"> <li>Full PFAS analytical suite (refer to the SAQP for full list of analytes).</li> <li>Major anions and cations (include calcium, magnesium, sodium, potassium, chloride, sulfate, alkalinity and ionic balance).</li> </ul>                                                                                                                                                                                                                      |
| Laboratory Testing – Quality Control                            | <p>Seepage water QC samples were collected at the following frequencies as detailed in the SAQP (Cardno, 2022):</p> <ul style="list-style-type: none"> <li>Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch is less than 10 samples.</li> <li>Field triplicate (inter-laboratory) samples at 1 per 10 water samples and sent to a secondary laboratory.</li> </ul>                                                                                                                                           |

| Activity | Details                                                                                                                                                                                           |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|          | <ul style="list-style-type: none"> <li>Rinsate blank sample at 1 per day [collected off re-used sampling equipment (e.g. interface probe)].</li> <li>Field blank samples at 1 per day.</li> </ul> |

### 3.3 Surface Water Sampling Methodology

Surface water monitoring procedure is detailed in Table 3-3.

Table 3-3 Surface water Sampling Method

| Activity                                                        | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Field parameters                                                | <p>The following field parameters were recorded using a water quality meter:</p> <ul style="list-style-type: none"> <li>pH.</li> <li>electrical conductivity (EC).</li> <li>oxidation reduction potential (ORP).</li> <li>Dissolved oxygen (DO).</li> <li>Temperature.</li> </ul> <p>Field observations such as water flow, odours or sheen presence were also recorded on field sampling sheets.</p>                                                                                                                                                                       |
| Sampling Method                                                 | <p>Surface water samples were collected directly into sample containers using a 'Grab' (manual) sample method via a long handled sampling device.</p> <p>Where depth permits, the sample container was positioned at least 10 cm below the surface water level and above the sediment bed and oriented with the capped opening facing downwards to avoid the collection of surface films.</p>                                                                                                                                                                               |
| Decontamination procedure                                       | <p>All re-usable sampling equipment was thoroughly washed using PFAS &amp; phosphate-free detergent, then double rinsed with clean water before the sample collection.</p>                                                                                                                                                                                                                                                                                                                                                                                                  |
| Sample identification, preservation transport and holding times | <p>Each sample was labelled with the sample location, date, project identification number and sampler's initials.</p> <p>Samples were collected directly into appropriately preserved laboratory supplied bottles (Teflon-free) and packed in chilled containers for delivery to the laboratory under CoC documentation.</p> <p>Sample containers, preservation procedures, sample storage requirements and holding times were undertaken in accordance with those recommended by Standards Australia (AS/NZS 5667.1:1998 and AS 4482.1 as appropriate).</p>                |
| Laboratory Testing                                              | <p>Surface water samples were submitted for the following analysis:</p> <ul style="list-style-type: none"> <li>Full PFAS analytical suite (refer to the SAQP for full list of analytes).</li> <li>Major anions and cations (include calcium, magnesium, sodium, potassium, chloride, sulfate, alkalinity and ionic balance).</li> </ul>                                                                                                                                                                                                                                     |
| Laboratory Testing – Quality Control                            | <p>Surface water QC samples were collected at the following frequencies as detailed in the SAQP (Cardno, 2022):</p> <ul style="list-style-type: none"> <li>Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch is less than 10 samples.</li> <li>Field triplicate (inter-laboratory) samples at 1 per 10 water samples and sent to a secondary laboratory.</li> <li>Rinsate blank sample at 1 per day [collected off re-used sampling equipment (e.g. interface probe)].</li> <li>Field blank samples at 1 per day.</li> </ul> |

### 3.4 Sediment Sampling Methodology

Sediment sampling methodology is detailed in Table 3-4.

Table 3-4 Sediment Sampling Method

| Activity                             | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sample Collection                    | <p>Sediment samples were collected at the sediment/water interface using hand tools (e.g. trowel, hand auger, PVC pipe etc.) with samples placed directly into appropriately labelled, laboratory supplied sample containers and packed in chilled containers for delivery to the laboratory under CoC documentation.</p> <p>At each sampling location, the sediment sample was visually assessed and observations (including physical description) recorded on field data sheets.</p>                                                                                                  |
| Field Records                        | <p>The following information was recorded on the field data sheets:</p> <ul style="list-style-type: none"> <li>Sampling time, date and name of the sampler.</li> <li>Weather conditions.</li> <li>Sample Collection method.</li> <li>Sampling equipment decontamination procedures where non-disposable sampling equipment is utilised.</li> </ul>                                                                                                                                                                                                                                      |
| Decontamination                      | <p>All re-usable sampling equipment was thoroughly washed using PFAS &amp; phosphate-free detergent, then double rinsed with clean water before the sample collection.</p>                                                                                                                                                                                                                                                                                                                                                                                                              |
| Laboratory Testing                   | <p>Sediment samples were submitted for the following analysis:</p> <ul style="list-style-type: none"> <li>Full PFAS analytical suite (refer to the SAQP for full list of analytes).</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                          |
| Laboratory Testing – Quality Control | <p>Sediment QC samples were collected at the following frequencies as detailed in the SAQP (Cardno, 2022):</p> <ul style="list-style-type: none"> <li>Field duplicate (intra-laboratory) samples greater than 1 per 20 sediment samples or 1 per batch if the batch is less than 20 samples.</li> <li>Field triplicate (inter-laboratory) samples greater than 1 per 20 sediment samples and sent to a secondary laboratory.</li> <li>Rinsate blank sample at 1 per day [collected off re-used sampling equipment (e.g. trowel)].</li> <li>Field blank samples at 1 per day.</li> </ul> |

### 3.5 Quality Control / Quality Assurance

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

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

A detailed review of these aspects has been undertaken, the results of which are presented in Appendix E.

The QA/QC review concluded that there are no significant systematic errors in the data collection process and therefore, the dataset used for the assessment is considered valid and complete.

### 3.6 Assessment Criteria

#### 3.6.1 Groundwater, Seepage water and surface water

The adopted assessment criteria for groundwater are detailed in Table 3-5.



Table 3-5 Criteria for groundwater, seepage water and surface water

| Exposure Scenario                                                                                                                                                                                                                                                                                                                                                               | Adopted Assessment Criteria |      | Guidance              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|------|-----------------------|
|                                                                                                                                                                                                                                                                                                                                                                                 | PFHxS / PFOS<br>µg/L        | PFOA |                       |
| Human Health – Recreational Water                                                                                                                                                                                                                                                                                                                                               | 2 <sup>1</sup>              | 10   | NHMRC 2019, HEPA 2020 |
| Ecological – 99% species protection                                                                                                                                                                                                                                                                                                                                             | 0.00023 <sup>2</sup>        | 19   | HEPA 2020             |
| <ol style="list-style-type: none"> <li>Sum of PFOS and PFHxS.</li> <li>PFOS only; Practical screening guideline of 0.01 µg/L is based on typical current laboratory limit of reporting. Therefore, it should be noted that warning and action levels would not be relevant until the detection limits are reduced or the screening levels are increased (HEPA 2020).</li> </ol> |                             |      |                       |

### 3.6.2 Sediment

The adopted assessment criteria for sediment are detailed in Table 3-6.

Table 3-6 Criteria for Sediment

| Exposure Scenario                                                                           | Adopted Assessment Criteria |      | Guidance  |
|---------------------------------------------------------------------------------------------|-----------------------------|------|-----------|
|                                                                                             | PFHxS / PFOS<br>mg/kg       | PFOA |           |
| Human Health - Commercial / industrial (on-base activities)                                 | 20 <sup>1</sup>             | 50   | HEPA 2020 |
| Ecological – Direct exposure (interim guidelines)                                           | 1 <sup>2</sup>              | 10   | HEPA 2020 |
| Ecological - indirect exposure (interim guidelines)                                         | 0.01 <sup>2</sup>           | -    | HEPA 2020 |
| <ol style="list-style-type: none"> <li>Sum of PFOS and PFHxS.</li> <li>PFOS only</li> </ol> |                             |      |           |

## 4 Field Observations and Results

### 4.1 General Site Observations

The site experienced above average rainfall for the months leading to the June 2022 monitoring event. Surface water was noted pooling in low laying areas of the site's drains and within the northern and southern drainage channels offsite.

No groundwater monitoring wells were found dry during the June 2022 monitoring event, however the area north of the site was flooded and access to monitoring well MW103 was not possible.

### 4.2 Groundwater

#### 4.2.1 Summary of Field Observations

##### 4.2.1.1 Physicochemical parameters

Stabilised physicochemical parameters, water colour and observations recorded during the groundwater sampling program are presented in field sampling records, included in Appendix D. Groundwater was fresh to hyper saline (TDS ranging from 1,287 mg/L to 68,383 mg/L), and near neutral (pH ranging 6.79 to 8.30). Groundwater temperature was on average 27.1°C, and DO readings indicate aerobic groundwater condition at most monitoring wells (DO ranging from 0.4 mg/L to 4.14 mg/L). Field parameters were generally consistent with the previous monitoring events.

#### 4.2.1.2 Groundwater Elevation and Migration

Well gauging was undertaken over two days and several tide cycles which has been considered when interpreting inferred groundwater contours and flow direction.

Groundwater elevations ranged from 0.811 mAHD (MW178) to 1.474 mAHD (MW165).

Groundwater flow beneath the maintenance area was interpreted to be easterly, towards the Exmouth Gulf, consistent with the previous monitoring events. Groundwater flow beneath the fuel farm and northern drainage channel was inferred to be southerly. Groundwater is generally inferred to flow towards areas of groundwater depression that lie between the Base and the coast (refer to Figure 3). Groundwater elevation in wells closer to the shore might be influenced by tidal effects.

Groundwater elevation contours and flow direction are shown in Figure 3, Appendix A. Gauging records are presented in Appendix D.

### 4.2.2 Groundwater Laboratory Results

#### 4.2.2.1 PFAS analytes

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

Table 4-1 Summary of Groundwater Results Exceeding Adopted Criteria

| Analytes              | Locations Exceeding Criteria                                                                                                                  | Lowest Criteria (µg/L) | Max Conc. (µg/L) | No. Analytical Results <sup>1</sup> | No. Results Above Criteria |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|------------------------|------------------|-------------------------------------|----------------------------|
| PFOA                  | -                                                                                                                                             | 10 <sup>2</sup>        | 2.05 (MW151)     | 48                                  | 0                          |
| PFOS                  | MW018, MW021, MW105, MW112, MW115, MW138, MW148D, MW148S, MW151, MW162, MW163, MW164, MW165, MW166, MW167, MW168, MW172, MW211, MW233, MW238. | 0.01 <sup>3</sup>      | 28.8 (MW151)     | 48                                  | 20                         |
| Sum of PFHxS and PFOS | MW148D, MW148S, MW151, MW162, MW163, MW164, MW167, MW172, MW211, MW233, MW238                                                                 | 2 <sup>2</sup>         | 58.4 (MW151)     | 48                                  | 11                         |

**Notes:**

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

Findings are summarised as follows:

- > There was no first-time detection of PFOA or the sum of PFOS and PFHxS for any of the groundwater monitoring locations in June 2022.
- > No new exceedance of a guideline value was reported for any of the groundwater monitoring locations in June 2022.

#### 4.2.2.2 Non-PFAS analytes

Tabulated laboratory results for non-PFAS analytes are provided within Appendix B. Results were compared to historical range for each monitoring location. Total anions concentrations ranged from 17.8 (MW211) and 1,350 (MW145) meq/L. Total cations concentrations ranged from 15.6 (MW233) and 1,340 (MW181) meq/L. Non-PFAS analytes concentrations were of the same order of magnitude as previous monitoring events. However, concentrations were observed to be in the lower end of the range, or slightly lower than historical data. This could be attributed to the high rainfall amount that had occurred in the months preceding the June 2022 monitoring event.

## 4.3 Seepage Water

### 4.3.1 Summary of Field Observations

Stabilised physiochemical parameters, water colour and turbidity observations recorded during the groundwater sampling program are presented in field sampling record sheets, included in Appendix D. Seepage water temperature was on average 23.2°C, DO readings indicate aerobic conditions, pH was near neutral, and TDS indicates brackish to saline water condition. Field parameters were generally consistent with the previous monitoring events.

### 4.3.2 Laboratory Results

#### 4.3.2.1 PFAS analytes

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

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

| Analytes              | Locations Exceeding Criteria | Lowest Criteria (µg/L) | Max Conc. (µg/L) | No. Analytical Results <sup>1</sup> | No. Results Above Criteria |
|-----------------------|------------------------------|------------------------|------------------|-------------------------------------|----------------------------|
| PFOA                  | -                            | 10 <sup>2</sup>        | <0.01            | 6                                   | 0                          |
| PFOS                  | OTH134                       | 0.01 <sup>3</sup>      | 0.11 (OTH134)    | 6                                   | 1                          |
| Sum of PFHxS and PFOS | -                            | 2 <sup>2</sup>         | 0.13 (OTH134)    | 6                                   | 0                          |

**Notes:**

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

Findings are summarised as follows:

- > One (1) out of six (6) seepage water samples reported PFOS concentrations above the LOR.
- > There was no first time detect of PFOA or Sum of PFOS and PFHxS or new exceedance of guideline values at the seepage water monitoring locations during the June 2022 monitoring event.

#### 4.3.2.2 Non-PFAS analytes

Tabulated laboratory results for non-PFAS analytes are provided within Appendix B. Results were compared to historical range for each monitoring location. Total anions concentrations ranged from 24.2 (OTH134) and 606 (OTH129) meq/L. Total cations concentrations ranged from 22.3 (OTH134) and 682 (OTH129) meq/L. Non-PFAS analytes concentrations were of the same order of magnitude as previous monitoring events except for OTH134 which was one order of magnitude below historical range. Concentrations were lower than historical data for all seepage water monitoring locations. This could be attributed to the high rainfall amount that had occurred in the months preceding the June 2022 monitoring event.

## 4.4 Surface water

### 4.4.1 Summary of Field Observations

Stabilised physiochemical parameters, water colour and turbidity observations recorded during the groundwater sampling program are presented in field sampling record sheets, included in Appendix D. Field parameters were generally consistent with the previous monitoring events. pH was near neutral to alkaline, and water condition was aerobic and fresh to saline (TDS ranging from 163.4 to 59,150 mg/L).

## 4.4.2 Laboratory Results

### 4.4.2.1 PFAS analytes

The results of laboratory analysis have been compared against adopted assessment criteria. Tabulated analytical results are provided within Appendix B. A summary of results exceeding the adopted criteria is presented in Table 4-3. Laboratory results have also been compared to available historical data in order to identify monitoring wells where a first-time detection of Sum of PFOS and PFHxS or PFOA; or a new exceedance of guideline values were reported. Figure 5 in Appendix A presents the surface water monitoring locations. The laboratory reports are provided in Appendix C.

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

| Analytes              | Locations Exceeding Criteria                                                                      | Lowest Criteria (µg/L) | Max Conc. (µg/L) | No. Analytical Results <sup>1</sup> | No. Results Above Criteria |
|-----------------------|---------------------------------------------------------------------------------------------------|------------------------|------------------|-------------------------------------|----------------------------|
| PFOA                  | -                                                                                                 | 10 <sup>2</sup>        | <0.01            | 26                                  | 0                          |
| PFOS                  | SW108, SW157, SW170, SW189, SW190, SW192, SW193, SW210, SW227, SW265, SW288, SW300, SW302, SW303. | 0.01 <sup>3</sup>      | 0.20 (SW190)     | 26                                  | 14                         |
| Sum of PFHxS and PFOS | -                                                                                                 | 2 <sup>2</sup>         | 0.20 (SW190)     | 26                                  | 0                          |

**Notes:**

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

Findings are summarised as follows:

- > SW108 and SW227 (both sampled for the first time) reported exceedances of the ecological criteria for PFOS (LOR adopted). These monitoring locations are situated within the central drainage channel at the site boundary, SW108 is onsite and SW227 is offsite.

### 4.4.2.2 Non-PFAS analytes

Tabulated laboratory results for non-PFAS analytes are provided within Appendix B. Results were compared to historical range, where available, for each monitoring location. Total anions concentrations ranged from 1.46 (SW200) and 1,120 (SW301) meq/L. Total cations concentrations ranged from 1.3 (SW200) and 1,090 (SW301) meq/L. Non-PFAS analytes concentrations were of the same order of magnitude as previous monitoring events except for SW298 which was one order of magnitude below historical range. However, concentrations were observed to be generally in the lower end of the range, or slightly lower than historical data. This could be attributed to the high rainfall amount that had occurred in the months preceding the June 2022 monitoring event.

## 4.5 Sediment

### 4.5.1 Summary of Field Observations

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

### 4.5.2 Laboratory Results

The results of laboratory analysis have been compared against adopted assessment criteria. Tabulated analytical results are provided within Appendix B. Soil criteria are adopted in the absence of criteria for sediment for consistency with the SAQP (Cardno, June 2022), DSI (GHD, 2018) and ERA (GHD, 2019). A summary of results exceeding the adopted criteria is presented in Table 4-4. Laboratory results have also been compared to available historical data to identify monitoring wells where a first-time detection of Sum of PFOS and PFHxS or PFOA; or a new exceedance of guideline values were reported. Figure 6 in Appendix A presents the sediment monitoring locations.

Table 4-4 Summary of Sediment Results Exceeding Adopted Criteria

| Analytes              | Locations Exceeding Criteria                           | Lowest Criteria (mg/kg) | Max Conc. (mg/kg)     | No. Analytical Results <sup>1</sup> | No. Results Above Criteria |
|-----------------------|--------------------------------------------------------|-------------------------|-----------------------|-------------------------------------|----------------------------|
| PFOA                  | -                                                      | 10 <sup>2</sup>         | 0.0003 (SD300, SS234) | 49                                  | 0                          |
| PFOS                  | SS108, SS114, SS121, SS123, SS124, SS234, SS235, SS243 | 0.01 <sup>3</sup>       | 0.365 (SS124)         | 49                                  | 8                          |
| Sum of PFHxS and PFOS | -                                                      | 20 <sup>4</sup>         | 0.365 (SS124)         | 49                                  | 0                          |

**Notes:**

1. Non-inclusive of quality control samples
2. Ecosystems – all land uses – Direct exposure (HEPA, 2020)
3. Ecosystems – all land uses – Indirect exposure (HEPA, 2020)
4. Human health – Commercial/Industrial (HEPA, 2020)

Findings are summarised as follows:

- > None of the sediment samples reported a new exceedance of guideline values.
- > SD300 (offsite, northern reach of WAPET Creek) recorded a first time detection of PFOA above the LOR (0.0003 mg/kg detected).

## 4.6 Changes to the Monitoring Network Condition

No changes to the monitoring network condition were noted during this sampling event.

## 5 Summary and Conclusions

Cardno undertook the June 2022 groundwater, seepage water, surface water and sediment monitoring event at RAAF Base Learmonth as part of the PFAS OMP. Groundwater sampling and testing was undertaken at 48 monitoring bores, 26 surface water locations, six (6) seepage water locations and 49 sediment monitoring locations. 23 surface water monitoring locations could not be sampled as these were found dry, one groundwater monitoring well could not be accessed due to flooding.

Groundwater levels were gauged in all wells before sampling. Groundwater is inferred to flow towards an area of groundwater depression that lies between the Base and the coast.

The groundwater laboratory results reported the following:

- > Of the 48 samples that were tested, PFOS (20 samples) and Sum of PFHxS and PFOS (11 samples) reported concentrations that exceeded the HEPA (2020) ecological guideline value for 99% protection species and HEPA (2020) guideline value for recreational use respectively.
- > There was no first time detection of PFOA or the sum of PFOS and PFHxS for any of the groundwater monitoring locations.
- > No new exceedance of a guideline value was reported for any of the groundwater monitoring locations.

The seepage water laboratory results reported the following:

- > One (1) out of six (6) seepage water samples reported PFOS concentrations above the HEPA (2020) ecological guideline value for 99% protection species.
- > There was no first time detect of PFOA or Sum of PFOS and PFHxS or new exceedance of guideline values at the seepage water monitoring locations during the June 2022 monitoring event.

The surface water laboratory results reported the following:

- > Of the 26 samples that were tested, PFOS (14 samples) reported concentrations that exceeded the HEPA (2020) ecological guideline value for 99% protection species.

- > SW108 and SW227 (both sampled for the first time) reported exceedances of the ecological criteria for PFOS. These monitoring locations are situated within the central drainage channel at the site boundary, SW108 is onsite and SW227 is offsite.

The sediment laboratory results reported the following:

- > Of the 49 sediment samples that were tested, PFOS (8 samples) reported concentrations that exceeded the HEPA (2020) ecological indirect exposure criteria.
- > SD300 (offsite, northern reach of WAPET Creek) recorded a first time detection of PFOA above the LOR (0.0003 mg/kg detected).
- > No new exceedance of guideline values was reported at any of the sediment monitoring locations during June 2022.

PFAS concentrations were generally within the historical range for all media sampled.

The next OMP sampling event for RAAF Base Learmonth will be the November 2022 biannual monitoring event. An Annual Interpretive Report will be prepared for the July 2021 – June 2022 monitoring period.

## 6 References

### General References

1. Australian Standard AS 4482-2005 Guide to the investigation and sampling of sites with potentially contaminated soils, Part 1 – Non-volatile and semi-volatile compounds.
2. Australian Standard AS 4482-1999 Guide to the investigation and sampling of sites with potentially contaminated soils, Part 2 – Volatile substances.
3. Australian Water Quality Guidelines for Fresh and Marine Water Quality (ANZECC and ARMCANZ, 2000).
4. *Contaminated Sites Act 2003*, Western Australia.
5. Department of Defence, May 2021, PFAS OMP Factual Report Guidance Version 0.2.
6. Department of Defence, July 2018 amended August 2019, *Contamination Management Manual*, Annex L *Guidance on Data Management*.
7. Department of the Environment and Energy (2017) in the National Greenhouse and Energy Reporting Scheme Measurement Technical Guidelines for the Estimation of Emissions by Facilities in Australia.
8. Department of Water and Environmental Regulation (DWER), 2021, *Assessment and Management of Contaminated Sites*.
9. Department of Water and Environment Regulation (DWER), 2018, Perth Groundwater Atlas, (<https://maps.water.wa.gov.au/#/webmap/gwm>).
10. Environmental Protection Agency (United States EPA), November 2002, Reference: EPA/240/R-02/004, 'Guidance on Environmental Data Verification and Data Validation'.
11. The Heads of EPAs Australia and New Zealand (HEPA; 2020) PFAS National Environmental Management Plan (NEMP) 2.0, January 2020.
12. National Environment Protection Council (NEPC), 1999, National Environmental Protection (Assessment of Site Contamination) Measure (as amended), registered May 2013.
13. National Health and Medical Research Council (NHMRC) (2011, as updated 2018) National Water Quality Management Strategy Australian Drinking Water Guidelines 6, August 2018
14. NHMRC, August 2019, Guidance on Per and Polyfluoroalkyl Substances (PFAS) in Recreational Water.
15. Standards Australia/Standards New Zealand (1998) AS5667.1:1998 'Water Quality – Sampling, Part 1: Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples'.
16. U.S. Environmental Protection Agency (EPA), 2000, 'Guidance for the Data Quality Objectives Process (EPA QA/G-4)'.
17. USEPA, 2002, 'Guidance on Environmental Data Verification and Data Validation (EPA QA/G-8)'.

### Site Specific References

18. Cardno, August 2022, PFAS OMP First Flush Sampling Event Factual Report RAAF Base Learmonth
19. Cardno, July 2022, *draft 2021 Annual Interpretive Report*, RAAF Base Learmonth
20. Cardno, April 2021, PFAS OMP Biannual Monitoring Event Factual Report RAAF Base Learmonth
21. Cardno, August 2021, PFAS OMP Biannual Monitoring Event Factual Report RAAF Base Learmonth
22. Cardno, July 2021, PFAS OMP 2020 Annual Interpretive Report, RAAF Base Learmonth
23. Cardno, June 2022, Reference: DEF19009, 'PFAS Ongoing Monitoring Plan Sampling and Analysis Quality Plan (SAQP) RAAF Base Learmonth'. Rev 6
24. Cardno, May 2021, PFAS OMP First Flush Sampling Event Factual Report RAAF Base Learmonth
25. Cardno, February 2021, OMP Biannual Monitoring Event Factual Report RAAF Base Learmonth
26. Cardno, July 2020, PFAS OMP First Flush Sampling Event Factual Report RAAF Base Learmonth
27. Cardno, April 2020, PFAS OMP Biannual Monitoring Event Factual Report RAAF Base Learmonth
28. Department of Defence, May 2019, RAAF Base Learmonth PFAS Ongoing Monitoring Plan.



29. GHD, December 2018, RAAF Base Learmonth – PFAS Investigations – Preliminary and Detailed Site Investigation Report.
30. GHD, April 2019, RAAF Base Learmonth – PFAS Investigations – Ecological Risk Assessment Preliminary (ERA).

APPENDIX

A

FIGURES



now



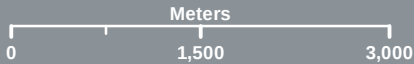


**Legend**

 Management Area

 RAAF Learmonth

FIGURE 1  
1:60,000 Scale at A3



Site Location

JUNE 2022 BIANNUAL MONITORING EVENT  
RAAF BASE LEARMONTH  
DEPARTMENT OF DEFENCE

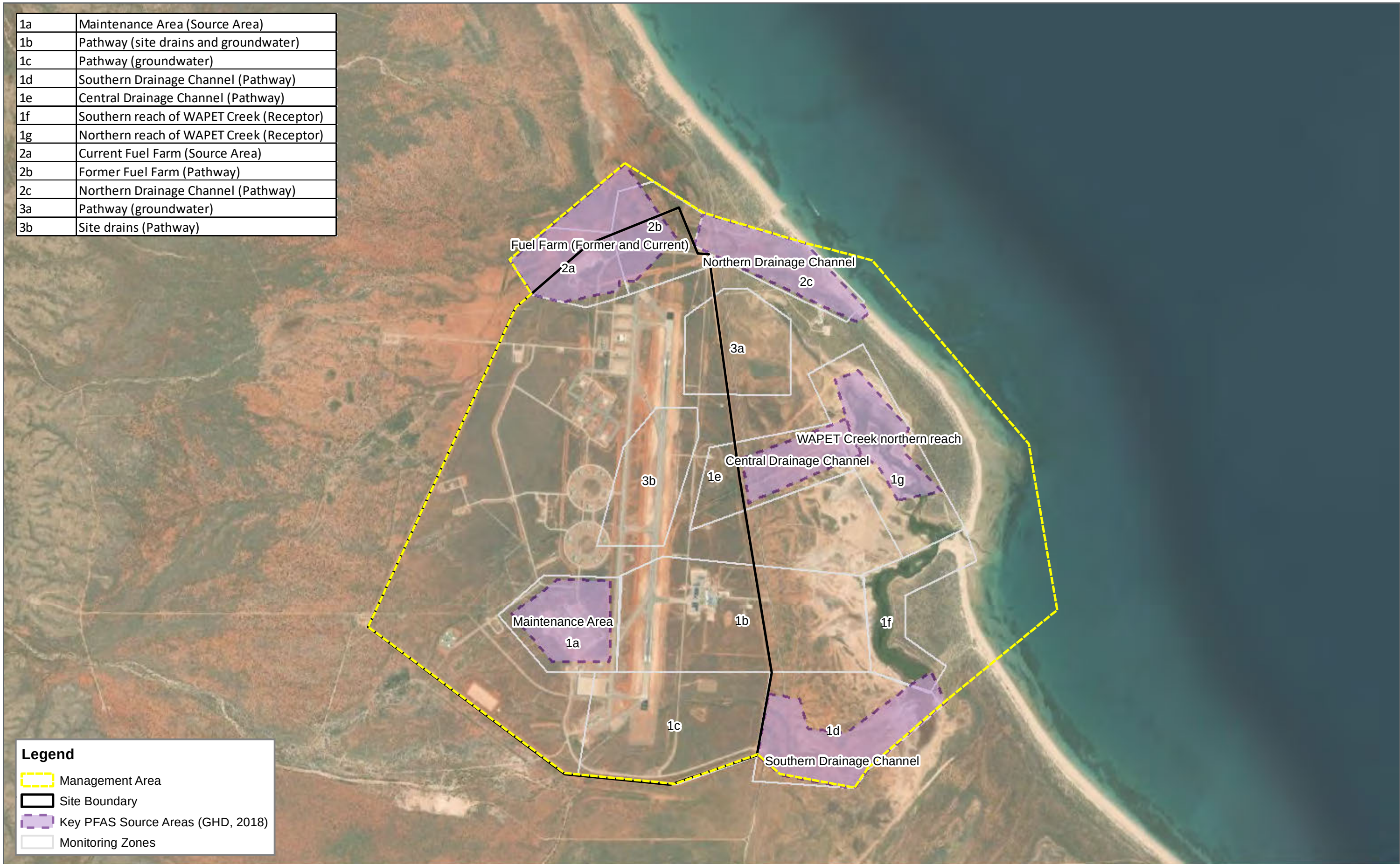




Map Produced by Cardno WA  
Date: 2022-09-08 | Project: DEF19009  
Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere  
Map: DEF19009\_WA\_0960-GS-001\_RegionalLocation 02.mxd  
Aerial Imagery Supplied by Google Earth



|    |                                          |
|----|------------------------------------------|
| 1a | Maintenance Area (Source Area)           |
| 1b | Pathway (site drains and groundwater)    |
| 1c | Pathway (groundwater)                    |
| 1d | Southern Drainage Channel (Pathway)      |
| 1e | Central Drainage Channel (Pathway)       |
| 1f | Southern reach of WAPET Creek (Receptor) |
| 1g | Northern reach of WAPET Creek (Receptor) |
| 2a | Current Fuel Farm (Source Area)          |
| 2b | Former Fuel Farm (Pathway)               |
| 2c | Northern Drainage Channel (Pathway)      |
| 3a | Pathway (groundwater)                    |
| 3b | Site drains (Pathway)                    |



**Legend**

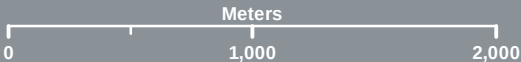
 Management Area

 Site Boundary

 Key PFAS Source Areas (GHD, 2018)

 Monitoring Zones

FIGURE 2  
1:31,000 Scale at A3



Management Area

JUNE 2022 BIANNUAL MONITORING EVENT  
RAAF BASE LEARMONTH  
DEPARTMENT OF DEFENCE



Map Produced by Cardno WA  
Date: 2022-09-08 | Project: DEF19009  
Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere  
Map: DEF19009\_WA\_0960-GS-002\_ManagementAreas 02.mxd  
Aerial Imagery Supplied by Google Earth



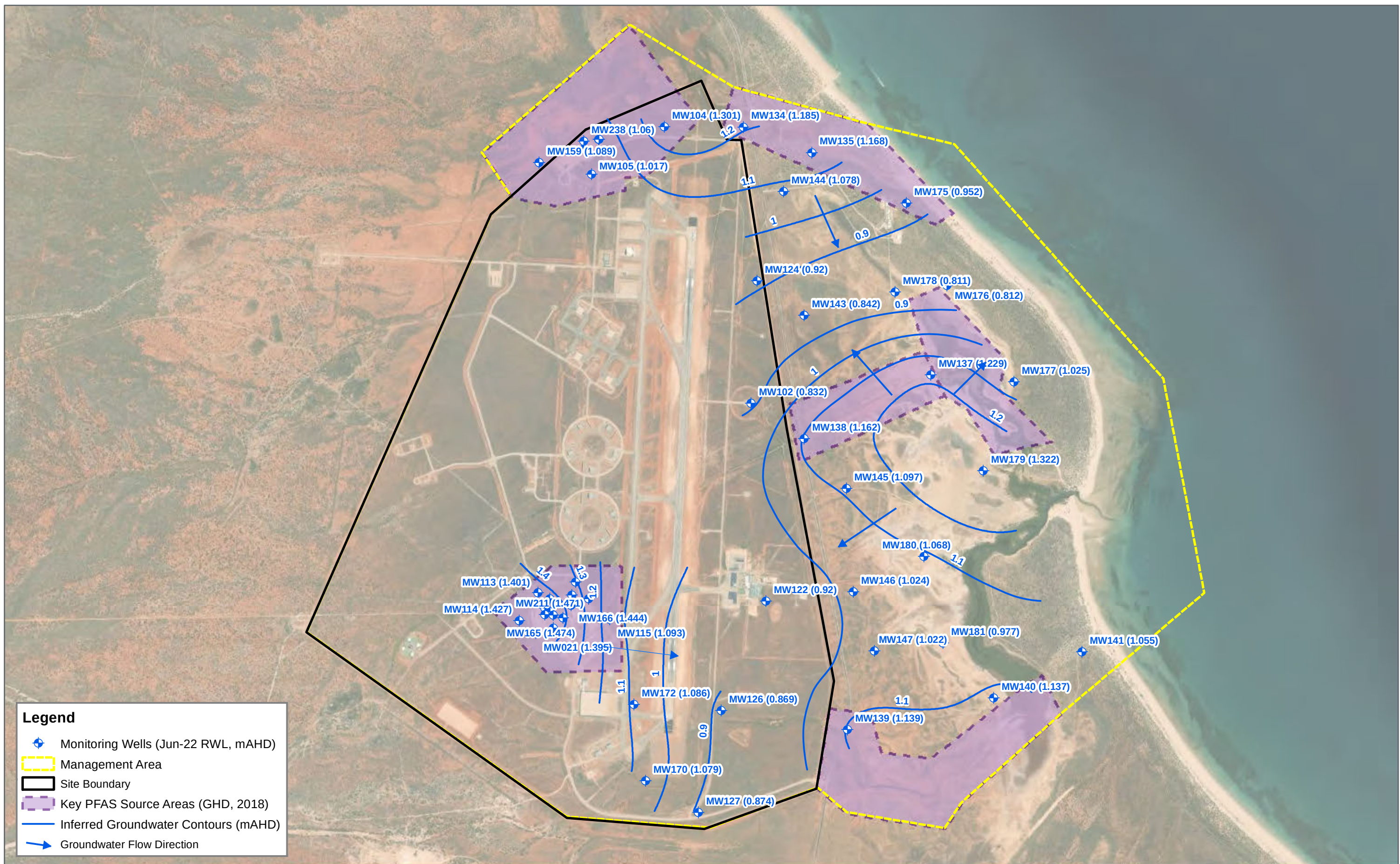


FIGURE 3  
1:22,000 Scale at A3

Meters  
0 750 1,500

## Inferred Groundwater Contours

JUNE 2022 BIENNIAL MONITORING EVENT  
RAAF BASE LEARMONTH  
DEPARTMENT OF DEFENCE



Map Produced by Cardno WA  
Date: 2022-09-08 | Project: DEF19009  
Coordinate System: GDA 1994 MGA Zone 50  
Map: DEF19009\_WA\_0960-GS-003\_GroundwaterElevationContours 01.mxd  
Aerial Imagery Supplied by Google Earth



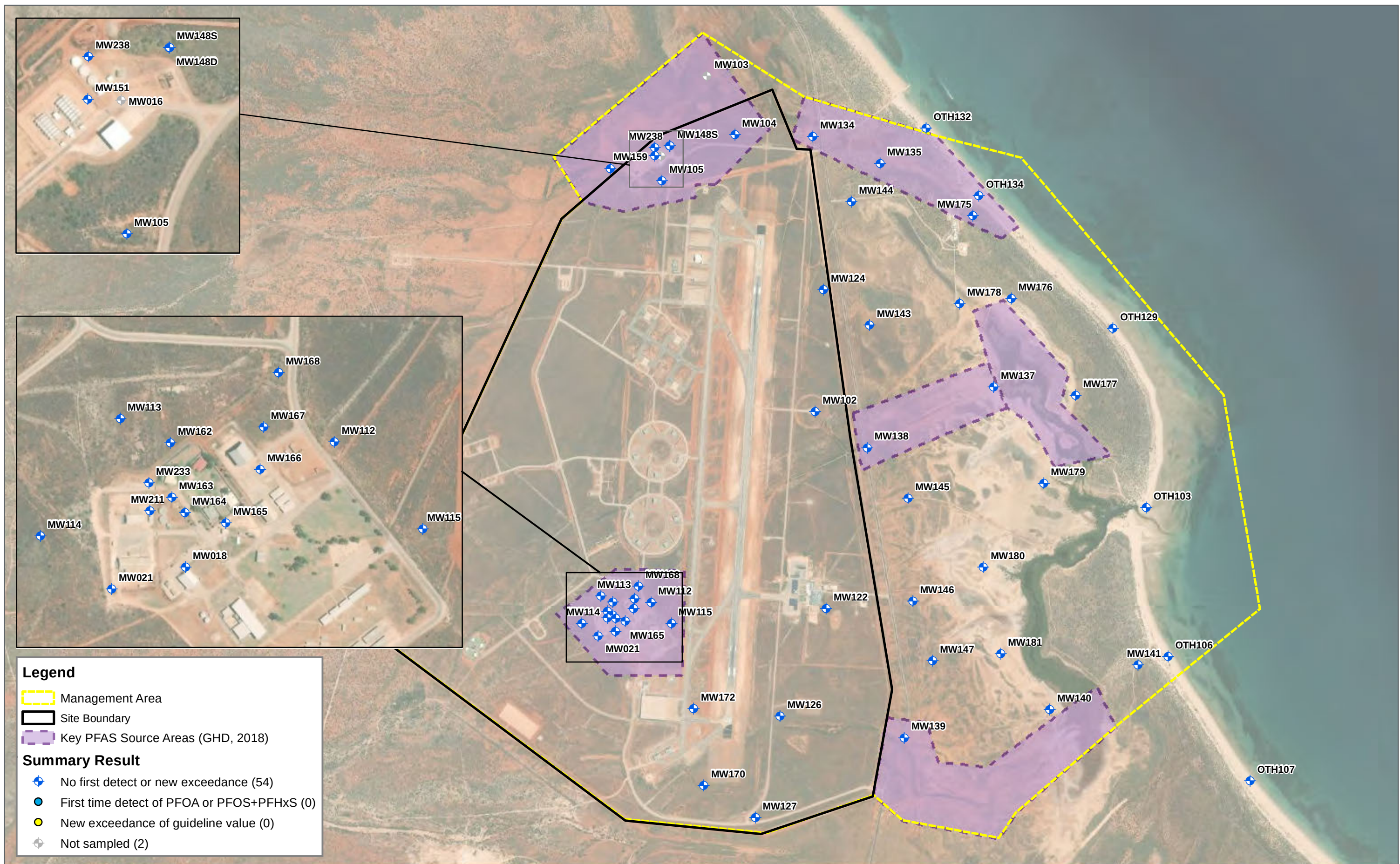


FIGURE 4  
1:24,000 Scale at A3

Meters  
0 1,000 2,000

## Groundwater & Seepage water Monitoring Locations and Results

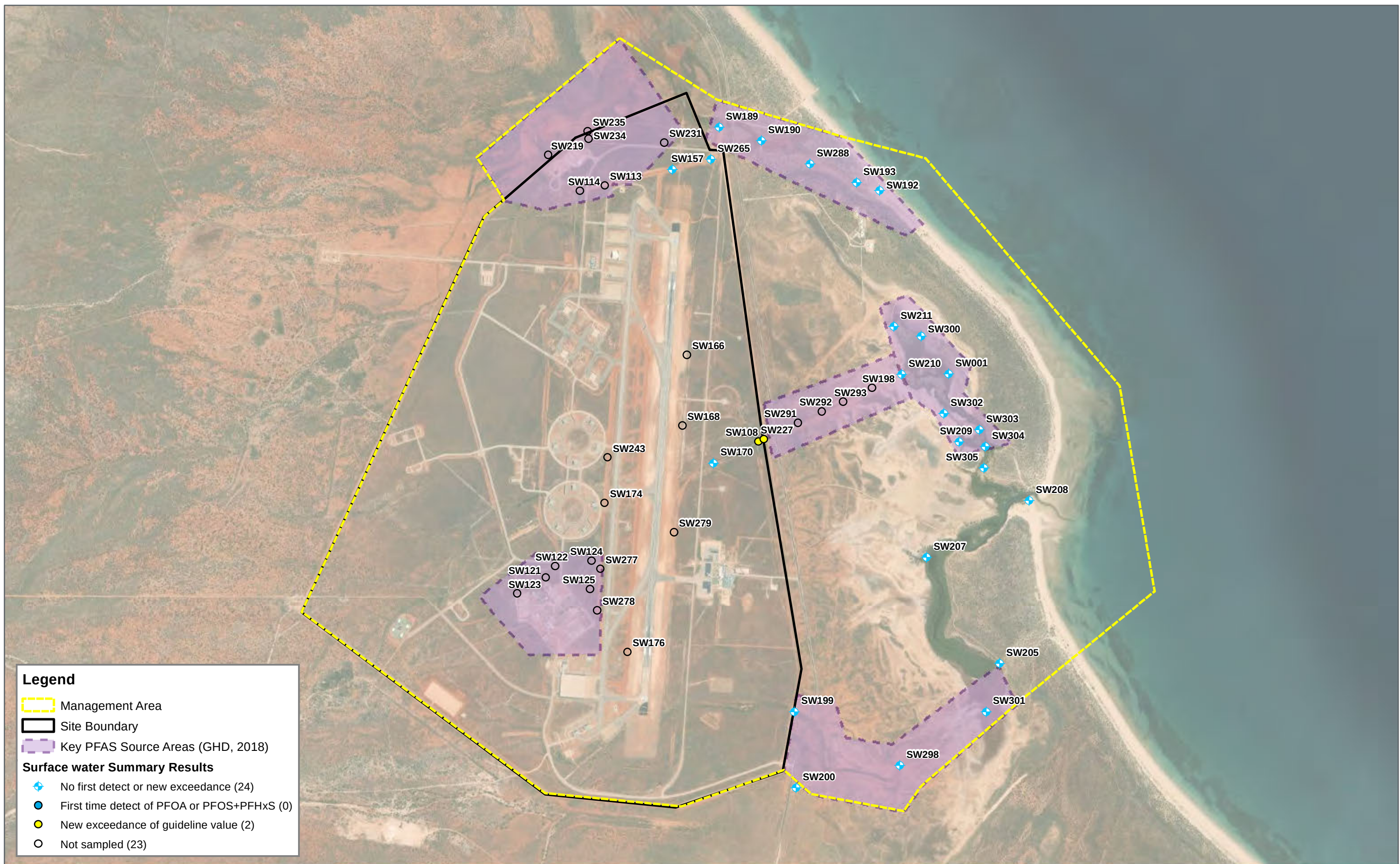
JUNE 2022 BIENNIAL SAMPLING EVENT  
RAAF BASE LEARMONTH  
DEPARTMENT OF DEFENCE



**Cardno**

Map Produced by Cardno WA  
Date: 2022-09-08 | Project: DEF19009  
Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere  
Map: DEF19009\_WA\_0960-GS-004\_GWResults\_Jun22 01.mxd  
Aerial Imagery Supplied by Google Earth





**Legend**

Management Area

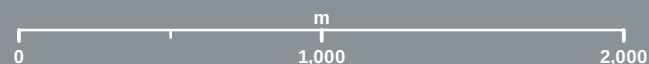
Site Boundary

Key PFAS Source Areas (GHD, 2018)

**Surface water Summary Results**

- No first detect or new exceedance (24)
- First time detect of PFOA or PFOS+PFHxS (0)
- New exceedance of guideline value (2)
- Not sampled (23)

FIGURE 5  
1:25,000 Scale at A3



## Surface water Monitoring Locations & Results

JUNE 2022 BIANNUAL MONITORING EVENT  
RAAF BASE LEARMONTH  
DEPARTMENT OF DEFENCE



Map Produced by Cardno WA  
Date: 2022-09-08 | Project: DEF19009  
Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere  
Map: DEF19009\_WA\_0960-GS-005\_SWResults\_Jun22 01.mxd







APPENDIX

# B

DATA ASSESSMENT TABLES



now



| PFAS - Perfluoroalkyl Sulfonic Acids |                                        |                                       |                                        |                                      |                                      | PFAS - Perfluoroalkyl Carboxylic Acids |                                 |                                |                                 |                               |                               |                               |                                   |                                   |                                   |                                      |                                           | PFAS - (n:2) Fluorotelomer Sulfonic Acids |                                           |                                             |       |
|--------------------------------------|----------------------------------------|---------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|----------------------------------------|---------------------------------|--------------------------------|---------------------------------|-------------------------------|-------------------------------|-------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|--------------------------------------|-------------------------------------------|-------------------------------------------|-------------------------------------------|---------------------------------------------|-------|
| Perfluorobutane sulfonic acid (PFBS) | Perfluoropentane sulfonic acid (PFPeS) | Perfluorohexane sulfonic acid (PFHxS) | Perfluoroheptane sulfonic acid (PFHpS) | Perfluorooctane sulfonic acid (PFOS) | Perfluorodecane sulfonic acid (PFDS) | Perfluorobutanoic acid (PFBA)          | Perfluoropentanoic acid (PFPeA) | Perfluorohexanoic acid (PFHxA) | Perfluoroheptanoic acid (PFHpA) | Perfluorooctanoic acid (PFOA) | Perfluorononanoic acid (PFNA) | Perfluorodecanoic acid (PFDA) | Perfluoroundecanoic acid (PFUnDA) | Perfluorododecanoic acid (PFDoDA) | Perfluorotridecanoic acid (PFTDA) | Perfluorotetradecanoic acid (PFTeDA) | 4:2 Fluorotelomer sulfonic acid (4:2 FTS) | 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | 10:2 Fluorotelomer sulfonic acid (10:2 FTS) |       |
| µg/L                                 | µg/L                                   | µg/L                                  | µg/L                                   | µg/L                                 | µg/L                                 | µg/L                                   | µg/L                            | µg/L                           | µg/L                            | µg/L                          | µg/L                          | µg/L                          | µg/L                              | µg/L                              | µg/L                              | µg/L                                 | µg/L                                      | µg/L                                      | µg/L                                      | µg/L                                        |       |
| LOR - Limit of Reporting             | 0.002                                  | 0.002                                 | 0.002                                  | 0.002                                | 0.004                                | 0.004                                  | 0.008                           | 0.002                          | 0.001                           | 0.004                         | 0.001                         | 0.002                         | 0.001                             | 0.001                             | 0.001                             | 0.001                                | 0.001                                     | 0.008                                     | 0.008                                     | 0.002                                       | 0.004 |
| PFAS NEMP 2020 Interim Marine 99%    |                                        |                                       |                                        |                                      | 0.00023*                             |                                        |                                 |                                |                                 | 19                            |                               |                               |                                   |                                   |                                   |                                      |                                           |                                           |                                           |                                             |       |
| PFAS NEMP 2020 Recreational Water    |                                        |                                       |                                        |                                      |                                      |                                        |                                 |                                |                                 | 10                            |                               |                               |                                   |                                   |                                   |                                      |                                           |                                           |                                           |                                             |       |

| Location Code | Field ID                  | Date       | Sample Type        | Lab Report Number |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
|---------------|---------------------------|------------|--------------------|-------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
|               | 0960_QC301_220622         | 22/06/2022 | Rinsate            | EP2207727         | <0.02  | <0.02  | <0.01  | <0.02  | <0.01  | <0.02  | <0.1   | <0.02  | <0.02  | <0.02  | <0.01  | <0.02  | <0.02  | <0.02  | <0.02  | <0.02  | <0.05  | <0.05  | <0.05  | <0.05  |        |
|               | 0960_QC301_230623         | 23/06/2022 | Rinsate            | EP2207810         | <0.02  | <0.02  | <0.01  | <0.02  | <0.01  | <0.02  | <0.1   | <0.02  | <0.02  | <0.02  | <0.01  | <0.02  | <0.02  | <0.02  | <0.02  | <0.02  | <0.05  | <0.05  | <0.05  | <0.05  |        |
|               | 0960_QC302_220622         | 22/06/2022 | Rinsate            | EP2207727         | <0.02  | <0.02  | <0.01  | <0.02  | <0.01  | <0.02  | <0.1   | <0.02  | <0.02  | <0.02  | <0.01  | <0.02  | <0.02  | <0.02  | <0.02  | <0.02  | <0.05  | <0.05  | <0.05  | <0.05  |        |
|               | 0960_QC302_230623         | 23/06/2022 | Rinsate            | EP2207810         | <0.02  | <0.02  | <0.01  | <0.02  | <0.01  | <0.02  | <0.1   | <0.02  | <0.02  | <0.02  | <0.01  | <0.02  | <0.02  | <0.02  | <0.02  | <0.02  | <0.05  | <0.05  | <0.05  | <0.05  |        |
|               | 0960_QC303_220622         | 22/06/2022 | Rinsate            | EP2207727         | <0.02  | <0.02  | <0.01  | <0.02  | <0.01  | <0.02  | <0.1   | <0.02  | <0.02  | <0.02  | <0.01  | <0.02  | <0.02  | <0.02  | <0.02  | <0.02  | <0.05  | <0.05  | <0.05  | <0.05  |        |
|               | 0960_QC401_220622         | 22/06/2022 | Field Blank        | EP2207727         | <0.02  | <0.02  | <0.01  | <0.02  | <0.01  | <0.02  | <0.1   | <0.02  | <0.02  | <0.02  | <0.01  | <0.02  | <0.02  | <0.02  | <0.02  | <0.02  | <0.05  | <0.05  | <0.05  | <0.05  |        |
|               | 0960_QC401_230623         | 23/06/2022 | Field Blank        | EP2207810         | <0.02  | <0.02  | <0.01  | <0.02  | <0.01  | <0.02  | <0.1   | <0.02  | <0.02  | <0.02  | <0.01  | <0.02  | <0.02  | <0.02  | <0.02  | <0.02  | <0.05  | <0.05  | <0.05  | <0.05  |        |
|               | 0960_QC402_220622         | 22/06/2022 | Field Blank        | EP2207727         | <0.02  | <0.02  | <0.01  | <0.02  | <0.01  | <0.02  | <0.1   | <0.02  | <0.02  | <0.02  | <0.01  | <0.02  | <0.02  | <0.02  | <0.02  | <0.02  | <0.05  | <0.05  | <0.05  | <0.05  |        |
|               | 0960_QC402_230623         | 23/06/2022 | Field Blank        | EP2207810         | <0.02  | <0.02  | <0.01  | <0.02  | <0.01  | <0.02  | <0.1   | <0.02  | <0.02  | <0.02  | <0.01  | <0.02  | <0.02  | <0.02  | <0.02  | <0.02  | <0.05  | <0.05  | <0.05  | <0.05  |        |
|               | 0960_QC403_220622         | 22/06/2022 | Field Blank        | EP2207727         | <0.02  | <0.02  | <0.01  | <0.02  | <0.01  | <0.02  | <0.1   | <0.02  | <0.02  | <0.02  | <0.01  | <0.02  | <0.02  | <0.02  | <0.02  | <0.02  | <0.05  | <0.05  | <0.05  | <0.05  |        |
| MW018         | 0960_MW018_220622         | 22/06/2022 | Normal             | EP2207731         | 0.06   | 0.08   | 1.14   | 0.05   | 0.55   | <0.02  | 0.8    | 1.92   | 1.89   | 0.79   | 0.09   | <0.02  | <0.02  | <0.02  | <0.02  | <0.02  | <0.05  | <0.05  | <0.05  | <0.05  |        |
| MW018         | 0960_QC117_220622         | 22/06/2022 | Field Duplicate    | EP2207731         | 0.05   | 0.07   | 1.03   | 0.04   | 0.52   | <0.02  | 0.7    | 1.72   | 1.70   | 0.68   | 0.08   | <0.02  | <0.02  | <0.02  | <0.02  | <0.02  | <0.05  | <0.05  | <0.05  | <0.05  |        |
| MW018         | 0960_QC217_220622         | 22/06/2022 | Interlab Duplicate | 901145            | 0.056  | 0.077  | 0.46   | 0.030  | 0.16   | <0.004 | 0.64   | 1.0    | 0.82   | 0.29   | 0.072  | <0.002 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.008 | <0.008 | <0.002 | <0.004 |
| MW021         | 0960_MW021_220622         | 22/06/2022 | Normal             | EP2207731         | 0.11   | 0.10   | 0.67   | <0.02  | 0.33   | <0.02  | <0.1   | 0.04   | 0.13   | <0.02  | 0.02   | <0.02  | <0.02  | <0.02  | <0.02  | <0.02  | <0.05  | <0.05  | <0.05  | <0.05  |        |
| MW102         | 0960_MW102_220622         | 22/06/2022 | Normal             | EP2207727         | <0.02  | <0.02  | <0.01  | <0.02  | <0.01  | <0.02  | <0.1   | <0.02  | <0.02  | <0.02  | <0.01  | <0.02  | <0.02  | <0.02  | <0.02  | <0.02  | <0.05  | <0.05  | <0.05  | <0.05  |        |
| MW104         | 0960_MW104_220622         | 22/06/2022 | Normal             | EP2207727         | 0.04   | <0.02  | 0.08   | <0.02  | <0.01  | <0.02  | <0.1   | <0.02  | <0.02  | <0.02  | <0.01  | <0.02  | <0.02  | <0.02  | <0.02  | <0.02  | <0.05  | <0.05  | <0.05  | <0.05  |        |
| MW105         | 0960_MW105_220622         | 22/06/2022 | Normal             | EP2207727         | 0.18   | 0.20   | 0.92   | <0.02  | 0.04   | <0.02  | <0.1   | 0.04   | 0.19   | <0.02  | 0.01   | <0.02  | <0.02  | <0.02  | <0.02  | <0.02  | <0.05  | <0.05  | <0.05  | <0.05  |        |
| MW105         | 0960_QC119_220622         | 22/06/2022 | Field Duplicate    | EP2207727         | 0.15   | 0.20   | 0.86   | <0.02  | 0.05   | <0.02  | <0.1   | 0.04   | 0.17   | <0.02  | 0.01   | <0.02  | <0.02  | <0.02  | <0.02  | <0.02  | <0.05  | <0.05  | <0.05  | <0.05  |        |
| MW105         | 0960_QC219_220622         | 22/06/2022 | Interlab Duplicate | 901145            | 0.15   | 0.20   | 0.11   | 0.006  | 0.034  | <0.004 | 0.044  | 0.025  | 0.017  | <0.004 | 0.014  | <0.002 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.008 | <0.008 | <0.002 | <0.004 |
| MW112         | 0960_MW112_220622         | 22/06/2022 | Normal             | EP2207737         | 0.03   | 0.05   | 0.55   | <0.02  | 0.77   | <0.02  | <0.1   | <0.02  | 0.10   | <0.02  | 0.02   | <0.02  | <0.02  | <0.02  | <0.02  | <0.02  | <0.05  | <0.05  | <0.05  | <0.05  |        |
| MW113         | 0960_MW113_220622         | 22/06/2022 | Normal             | EP2207731         | <0.02  | <0.02  | <0.01  | <0.02  | <0.01  | <0.02  | <0.1   | <0.02  | <0.02  | <0.02  | <0.01  | <0.02  | <0.02  | <0.02  | <0.02  | <0.02  | <0.05  | <0.05  | <0.05  | <0.05  |        |
| MW114         | 0960_MW114_220622         | 22/06/2022 | Normal             | EP2207731         | <0.02  | <0.02  | <0.01  | <0.02  | <0.01  | <0.02  | <0.1   | <0.02  | <0.02  | <0.02  | <0.01  | <0.02  | <0.02  | <0.02  | <0.02  | <0.02  | <0.05  | <0.05  | <0.05  | <0.05  |        |
| MW115         | 0960_MW115_220622         | 22/06/2022 | Normal             | EP2207737         | 0.17   | 0.20   | 1.35   | 0.03   | 0.27   | <0.02  | <0.1   | 0.06   | 0.34   | 0.02   | 0.03   | <0.02  | <0.02  | <0.02  | <0.02  | <0.02  | <0.05  | <0.05  | <0.05  | <0.05  |        |
| MW122         | 0960_MW122_220622         | 22/06/2022 | Normal             | EP2207731         | <0.02  | <0.02  | <0.01  | <0.02  | <0.01  | <0.02  | <0.1   | <0.02  | <0.02  | <0.02  | <0.01  | <0.02  | <0.02  | <0.02  | <0.02  | <0.02  | <0.05  | <0.05  | <0.05  | <0.05  |        |
| MW122         | 0960_QC124_220622         | 22/06/2022 | Field Duplicate    | EP2207731         | <0.02  | <0.02  | <0.01  | <0.02  | <0.01  | <0.02  | <0.1   | <0.02  | <0.02  | <0.02  | <0.01  | <0.02  | <0.02  | <0.02  | <0.02  | <0.02  | <0.05  | <0.05  | <0.05  | <0.05  |        |
| MW122         | 0960_QC224_220622         | 22/06/2022 | Interlab Duplicate | 901145            | <0.002 | <0.002 | <0.002 | <0.002 | <0.004 | <0.004 | <0.008 | <0.002 | <0.001 | <0.004 | <0.001 | <0.002 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.008 | <0.008 | <0.002 | <0.004 |
| MW124         | 0960_MW124_220622         | 22/06/2022 | Normal             | EP2207727         | <0.02  | <0.02  | <0.01  | <0.02  | <0.01  | <0.02  | <0.1   | <0.02  | <0.02  | <0.02  | <0.01  | <0.02  | <0.02  | <0.02  | <0.02  | <0.02  | <0.05  | <0.05  | <0.05  | <0.05  |        |
| MW126         | 0960_MW126_220622         | 22/06/2022 | Normal             | EP2207731         | <0.02  | <0.02  | <0.01  | <0.02  | <0.01  | <0.02  | <0.1   | <0.02  | <0.02  | <0.02  | <0.01  | <0.02  | <0.02  | <0.02  | <0.02  | <0.02  | <0.05  | <0.05  | <0.05  | <0.05  |        |
| MW127         | 0960_MW127_220622         | 22/06/2022 | Normal             | EP2207731         | <0.02  | <0.02  | <0.01  | <0.02  | <0.01  | <0.02  | <0.1   | <0.02  | <0.02  | <0.02  | <0.01  | <0.02  | <0.02  | <0.02  | <0.02  | <0.02  | <0.05  | <0.05  | <0.05  | <0.05  |        |
| MW134         | 0960_MW134_230623         | 23/06/2022 | Normal             | EP2207810         | <0.02  | <0.02  | <0.01  | <0.02  | <0.01  | <0.02  | <0.1   | <0.02  | <0.02  | <0.02  | <0.01  | <0.02  | <0.02  | <0.02  | <0.02  | <0.02  | <0.05  | <0.05  | <0.05  | <0.05  |        |
| MW135         | 0960_MW135_2.5-3_230623   | 23/06/2022 | Normal             | EP2207810         | <0.02  | <0.02  | <0.01  | <0.02  | <0.01  | <0.02  | <0.1   | <0.02  | <0.02  | <0.02  | <0.01  | <0.02  | <0.02  | <0.02  | <0.02  | <0.02  | <0.05  | <0.05  | <0.05  | <0.05  |        |
| MW137         | 0960_MW137_0.8-1.3_220622 | 22/06/2022 | Normal             | EP2207737         | <0.02  | <0.02  | <0.01  | <0.02  | <0.01  | <0.02  | <0.1   | <0.02  | <0.02  | <0.02  | <0.01  | <0.02  | <0.02  | <0.02  | <0.02  | <0.02  | <0.05  | <0.05  | <0.05  | <0.05  |        |
| MW138         | 0960_MW138_3-3.5_220622   | 22/06/2022 | Normal             | EP2207731         | <0.02  | <0.02  | 0.10   | <0.02  | 0.44   | <0.02  | <0.1   | <0.02  | <0.02  | <0.02  | 0.02   | <0.02  | <0.02  | <0.02  | <0.02  | <0.02  | <0.05  | <0.05  | <0.05  | <0.05  |        |
| MW139         | 0960_MW139_220622         | 22/06/2022 | Normal             | EP2207731         | <0.02  | <0.02  | <0.01  | <0.02  | <0.01  | <0.02  | <0.1   | <0.02  | <0.02  | <0.02  | <0.01  | <0.02  | <0.02  | <0.02  | <0.02  | <0.02  | <0.05  | <0.05  | <0.05  | <0.05  |        |
| MW140         | 0960_MW140_1.5-2_230623   | 23/06/2022 | Normal             | EP2207810         | <0.02  | <0.02  | <0.01  | <0.02  | <0.01  | <0.02  | <0.1   | <0.02  | <0.02  | <0.02  | <0.01  | <0.02  | <0.02  | <0.02  | <0.02  | <0.02  | <0.05  | <0.05  | <0.05  | <0.05  |        |
| MW141         | 0960_MW141_1.5-2_230623   | 23/06/2022 | Normal             | EP2207810         | <0.02  | <0.02  | <0.01  | <0.02  | <0.01  | <0.02  | <0.1   | <0.02  | <0.02  | <0.02  | <0.01  | <0.02  | <0.02  | <0.02  | <0.02  | <0.02  | <0.05  | <0.05  | <0.05  | <0.05  |        |
| MW143         | 0960_MW143_3-3.5_220622   | 22/06/2022 | Normal             | EP2207731         | <0.02  | <0.02  | <0.01  | <0.02  | <0.01  | <0.02  | <0.1   | <0.02  | <0.02  | <0.02  | <0.01  | <0.02  | <0.02  | &lt    |        |        |        |        |        |        |        |

|                                   | PFAS - Perfluoroalkyl Sulfonic Acids |                                        |                                       |                                        |                                      |                                      | PFAS - Perfluoroalkyl Carboxylic Acids |                                 |                                |                                 |                               |                               |                               |                                   | PFAS - (n:2) Fluorotelomer Sulfonic Acids |                                    |                                      |                                           |                                           |                                           |                                             |      |
|-----------------------------------|--------------------------------------|----------------------------------------|---------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|----------------------------------------|---------------------------------|--------------------------------|---------------------------------|-------------------------------|-------------------------------|-------------------------------|-----------------------------------|-------------------------------------------|------------------------------------|--------------------------------------|-------------------------------------------|-------------------------------------------|-------------------------------------------|---------------------------------------------|------|
|                                   | Perfluorobutane sulfonic acid (PFBS) | Perfluoropentane sulfonic acid (PFPeS) | Perfluorohexane sulfonic acid (PFHxS) | Perfluoroheptane sulfonic acid (PFHpS) | Perfluorooctane sulfonic acid (PFOS) | Perfluorodecane sulfonic acid (PFDS) | Perfluorobutanoic acid (PFBA)          | Perfluoropentanoic acid (PFPeA) | Perfluorohexanoic acid (PFHxA) | Perfluoroheptanoic acid (PFHpA) | Perfluorooctanoic acid (PFOA) | Perfluorononanoic acid (PFNA) | Perfluorodecanoic acid (PFDA) | Perfluoroundecanoic acid (PFUnDA) | Perfluorododecanoic acid (PFDoDA)         | Perfluorotridecanoic acid (PFTrDA) | Perfluorotetradecanoic acid (PFTeDA) | 4:2 Fluorotelomer sulfonic acid (4:2 FTS) | 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | 10:2 Fluorotelomer sulfonic acid (10:2 FTS) |      |
|                                   | µg/L                                 | µg/L                                   | µg/L                                  | µg/L                                   | µg/L                                 | µg/L                                 | µg/L                                   | µg/L                            | µg/L                           | µg/L                            | µg/L                          | µg/L                          | µg/L                          | µg/L                              | µg/L                                      | µg/L                               | µg/L                                 | µg/L                                      | µg/L                                      | µg/L                                      | µg/L                                        | µg/L |
| LOR - Limit of Reporting          | 0.002                                | 0.002                                  | 0.002                                 | 0.002                                  | 0.004                                | 0.004                                | 0.008                                  | 0.002                           | 0.001                          | 0.004                           | 0.001                         | 0.002                         | 0.001                         | 0.001                             | 0.001                                     | 0.001                              | 0.001                                | 0.008                                     | 0.008                                     | 0.002                                     | 0.004                                       |      |
| PFAS NEMP 2020 Interim Marine 99% |                                      |                                        |                                       |                                        | 0.00023*                             |                                      |                                        |                                 |                                |                                 | 19                            |                               |                               |                                   |                                           |                                    |                                      |                                           |                                           |                                           |                                             |      |
| PFAS NEMP 2020 Recreational Water |                                      |                                        |                                       |                                        |                                      |                                      |                                        |                                 |                                |                                 | 10                            |                               |                               |                                   |                                           |                                    |                                      |                                           |                                           |                                           |                                             |      |

| Location Code | Field ID | Date | Sample Type | Lab Report Number |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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|                                   | PFAS - Perfluoroalkyl Sulfonamides |                                               |                                                     |                                                      |                                              |                                                    |                                                     | PFAS                  |             | Inorganics                      |                                   |                                 |                             |              |               |          |               | Metals                                     |                    |                      |                      |                   |
|-----------------------------------|------------------------------------|-----------------------------------------------|-----------------------------------------------------|------------------------------------------------------|----------------------------------------------|----------------------------------------------------|-----------------------------------------------------|-----------------------|-------------|---------------------------------|-----------------------------------|---------------------------------|-----------------------------|--------------|---------------|----------|---------------|--------------------------------------------|--------------------|----------------------|----------------------|-------------------|
|                                   | Perfluorooctane sulfonamide (FOSA) | N-Methyl perfluorooctane sulfonamide (MeFOSA) | N-Methyl perfluorooctane sulfonamide acid (MeFOSAA) | N-methyl perfluorooctane sulfonamidoethanol (MeFOSE) | N-Ethyl perfluorooctane sulfonamide (EtFOSA) | N-Ethyl perfluorooctane sulfonamide acid (EtFOSAA) | N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE) | Sum of PFHxS and PFOS | Sum of PFAS | Carbonate Alkalinity (as CaCO3) | Alkalinity (Bicarbonate as CaCO3) | Alkalinity (Hydroxide) as CaCO3 | Alkalinity (total) as CaCO3 | Anions Total | Cations Total | Chloride | Ionic Balance | Sulphate as SO4 - Turbidimetric (filtered) | Calcium (filtered) | Magnesium (filtered) | Potassium (filtered) | Sodium (filtered) |
|                                   | µg/L                               | µg/L                                          | µg/L                                                | µg/L                                                 | µg/L                                         | µg/L                                               | µg/L                                                | µg/L                  | µg/L        | mg/L                            | mg/L                              | mg/L                            | mg/L                        | meq/L        | meq/L         | mg/L     | %             | mg/L                                       | mg/L               | mg/L                 | mg/L                 | mg/L              |
| LOR - Limit of Reporting          | 0.004                              | 0.004                                         | 0.004                                               | 0.008                                                | 0.004                                        | 0.004                                              | 0.008                                               | 0.002                 | 0.001       | 1                               | 1                                 | 1                               | 1                           | 0.01         | 0.01          | 1        | 0.01          | 1                                          | 1                  | 1                    | 1                    | 1                 |
| PFAS NEMP 2020 Interim Marine 99% |                                    |                                               |                                                     |                                                      |                                              |                                                    |                                                     |                       |             |                                 |                                   |                                 |                             |              |               |          |               |                                            |                    |                      |                      |                   |
| PFAS NEMP 2020 Recreational Water |                                    |                                               |                                                     |                                                      |                                              |                                                    |                                                     | 2                     |             |                                 |                                   |                                 |                             |              |               |          |               |                                            |                    |                      |                      |                   |

| Location Code | Field ID                  | Date       | Sample Type        | Lab Report Number |        |        |        |        |        |        |        |        |        |    |       |    |       |       |       |        |      |       |       |       |       |        |
|---------------|---------------------------|------------|--------------------|-------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----|-------|----|-------|-------|-------|--------|------|-------|-------|-------|-------|--------|
|               | 0960_QC301_220622         | 22/06/2022 | Rinsate            | EP2207727         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01  | <0.01  |    |       |    |       |       |       |        |      |       |       |       |       |        |
|               | 0960_QC301_230623         | 23/06/2022 | Rinsate            | EP2207810         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01  | <0.01  |    |       |    |       |       |       |        |      |       |       |       |       |        |
|               | 0960_QC302_220622         | 22/06/2022 | Rinsate            | EP2207727         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01  | <0.01  |    |       |    |       |       |       |        |      |       |       |       |       |        |
|               | 0960_QC302_230623         | 23/06/2022 | Rinsate            | EP2207810         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01  | <0.01  |    |       |    |       |       |       |        |      |       |       |       |       |        |
|               | 0960_QC303_220622         | 22/06/2022 | Rinsate            | EP2207727         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01  | <0.01  |    |       |    |       |       |       |        |      |       |       |       |       |        |
|               | 0960_QC401_220622         | 22/06/2022 | Field Blank        | EP2207727         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01  | <0.01  |    |       |    |       |       |       |        |      |       |       |       |       |        |
|               | 0960_QC401_230623         | 23/06/2022 | Field Blank        | EP2207810         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01  | <0.01  |    |       |    |       |       |       |        |      |       |       |       |       |        |
|               | 0960_QC402_220622         | 22/06/2022 | Field Blank        | EP2207727         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01  | <0.01  |    |       |    |       |       |       |        |      |       |       |       |       |        |
|               | 0960_QC402_230623         | 23/06/2022 | Field Blank        | EP2207810         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01  | <0.01  |    |       |    |       |       |       |        |      |       |       |       |       |        |
|               | 0960_QC403_220622         | 22/06/2022 | Field Blank        | EP2207727         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01  | <0.01  |    |       |    |       |       |       |        |      |       |       |       |       |        |
| MW018         | 0960_MW018_220622         | 22/06/2022 | Normal             | EP2207731         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | 1.69   | 7.37   | <1 | 996   | <1 | 996   | 29.4  | 25.1  | 214    | 7.93 | 166   | 8     | 10    | 21    | 536    |
| MW018         | 0960_QC117_220622         | 22/06/2022 | Field Duplicate    | EP2207731         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | 1.55   | 6.59   | <1 | 995   | <1 | 995   | 28.7  | 25.7  | 197    | 5.40 | 156   | 8     | 10    | 20    | 552    |
| MW018         | 0960_QC217_220622         | 22/06/2022 | Interlab Duplicate | 901145            | <0.004 | <0.004 | <0.004 | <0.008 | <0.004 | <0.004 | <0.008 | 0.62   | 3.7    |    |       |    |       |       |       |        |      |       |       |       |       |        |
| MW021         | 0960_MW021_220622         | 22/06/2022 | Normal             | EP2207731         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | 1.00   | 1.40   | <1 | 1,150 | <1 | 1,150 | 31.4  | 27.9  | 234    | 5.79 | 86    | 4     | 7     | 21    | 612    |
| MW102         | 0960_MW102_220622         | 22/06/2022 | Normal             | EP2207727         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01  | <0.01  | <1 | 139   | <1 | 139   | 1,140 | 1,110 | 37,300 | 1.72 | 4,320 | 1,380 | 2,240 | 696   | 19,200 |
| MW104         | 0960_MW104_220622         | 22/06/2022 | Normal             | EP2207727         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | 0.08   | 0.12   | <1 | 207   | <1 | 207   | 871   | 995   | 27,800 | 6.63 | 3,970 | 729   | 2,200 | 967   | 17,300 |
| MW105         | 0960_MW105_220622         | 22/06/2022 | Normal             | EP2207727         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | 0.96   | 1.58   | <1 | 351   | <1 | 351   | 464   | 513   | 15,000 | 5.01 | 1,620 | 596   | 1,220 | 488   | 8,510  |
| MW105         | 0960_QC119_220622         | 22/06/2022 | Field Duplicate    | EP2207727         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | 0.91   | 1.48   | <1 | 344   | <1 | 344   | 467   | 487   | 15,100 | 2.06 | 1,650 | 556   | 1,140 | 471   | 8,120  |
| MW105         | 0960_QC219_220622         | 22/06/2022 | Interlab Duplicate | 901145            | <0.004 | <0.004 | <0.004 | <0.008 | <0.004 | <0.004 | <0.008 | 0.14   | 0.60   |    |       |    |       |       |       |        |      |       |       |       |       |        |
| MW112         | 0960_MW112_220622         | 22/06/2022 | Normal             | EP2207737         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | 1.32   | 1.52   | <1 | 755   | <1 | 755   | 129   | 124   | 3,180  | 1.89 | 1,150 | 102   | 145   | 116   | 2,390  |
| MW113         | 0960_MW113_220622         | 22/06/2022 | Normal             | EP2207731         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01  | <0.01  | <1 | 396   | <1 | 396   | 110   | 96.4  | 3,410  | 6.36 | 261   | 188   | 169   | 71    | 1,640  |
| MW114         | 0960_MW114_220622         | 22/06/2022 | Normal             | EP2207731         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01  | <0.01  | <1 | 460   | <1 | 460   | 90.0  | 83.4  | 2,670  | 3.82 | 264   | 123   | 116   | 62    | 1,520  |
| MW115         | 0960_MW115_220622         | 22/06/2022 | Normal             | EP2207737         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | 1.62   | 2.47   | <1 | 349   | <1 | 349   | 375   | 340   | 11,900 | 4.91 | 1,550 | 494   | 715   | 294   | 5,720  |
| MW122         | 0960_MW122_220622         | 22/06/2022 | Normal             | EP2207731         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01  | <0.01  | <1 | 350   | <1 | 350   | 521   | 573   | 16,600 | 4.68 | 2,220 | 428   | 1,130 | 575   | 10,200 |
| MW122         | 0960_QC124_220622         | 22/06/2022 | Field Duplicate    | EP2207731         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01  | <0.01  | <1 | 370   | <1 | 370   | 487   | 472   | 15,700 | 1.60 | 1,780 | 324   | 870   | 514   | 8,530  |
| MW122         | 0960_QC224_220622         | 22/06/2022 | Interlab Duplicate | 901145            | <0.004 | <0.004 | <0.004 | <0.008 | <0.004 | <0.004 | <0.008 | <0.002 | <0.001 |    |       |    |       |       |       |        |      |       |       |       |       |        |
| MW124         | 0960_MW124_220622         | 22/06/2022 | Normal             | EP2207727         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01  | <0.01  | <1 | 159   | <1 | 159   | 1,050 | 1,010 | 33,400 | 1.73 | 4,920 | 869   | 2,190 | 901   | 17,600 |
| MW126         | 0960_MW126_220622         | 22/06/2022 | Normal             | EP2207731         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01  | <0.01  | <1 | 198   | <1 | 198   | 764   | 848   | 25,100 | 5.17 | 2,510 | 1,020 | 1,840 | 736   | 14,400 |
| MW127         | 0960_MW127_220622         | 22/06/2022 | Normal             | EP2207731         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01  | <0.01  | <1 | 165   | <1 | 165   | 734   | 806   | 24,000 | 4.70 | 2,570 | 1,070 | 1,630 | 548   | 13,900 |
| MW134         | 0960_MW134_230623         | 23/06/2022 | Normal             | EP2207810         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01  | <0.01  | <1 | 168   | <1 | 168   | 727   | 701   | 23,100 | 1.78 | 3,450 | 594   | 1,440 | 712   | 12,300 |
| MW135         | 0960_MW135_2.5-3_230623   | 23/06/2022 | Normal             | EP2207810         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01  | <0.01  | <1 | 182   | <1 | 182   | 374   | 375   | 11,900 | 0.04 | 1,690 | 369   | 832   | 372   | 6,400  |
| MW137         | 0960_MW137_0.8-1.3_220622 | 22/06/2022 | Normal             | EP2207737         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01  | <0.01  | <1 | 252   | <1 | 252   | 1,100 | 1,200 | 35,700 | 4.47 | 4,200 | 752   | 2,720 | 1,080 | 21,000 |
| MW138         | 0960_MW138_3-3.5_220622   | 22/06/2022 | Normal             | EP2207731         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | 0.54   | 0.56   | <1 | 268   | <1 | 268   | 508   | 499   | 16,200 | 0.89 | 2,200 | 485   | 1,070 | 502   | 8,600  |
| MW139         | 0960_MW139_220622         | 22/06/2022 | Normal             | EP2207731         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01  | <0.01  | <1 | 194   | <1 | 194   | 698   | 749   | 21,800 | 3.53 | 3,800 | 739   | 1,760 | 754   | 12,600 |
| MW140         | 0960_MW140_1.5-2_230623   | 23/06/2022 | Normal             | EP2207810         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01  | <0.01  | <1 | 180   | <1 | 180   | 1,270 | 1,160 | 41,300 | 4.83 | 5,090 | 781   | 2,620 | 1,100 | 20,100 |
| MW141         | 0960_MW141_1.5-2_230623   | 23/06/2022 | Normal             | EP2207810         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01  | <0.01  | <1 | 337   | <1 | 337   | 431   | 458   | 13,400 | 3.08 | 2,230 | 307   | 925   | 443   | 8,180  |
| MW143         | 0960_MW143_3-3.5_220622   | 22/06/2022 | Normal             | EP2207731         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01  | <0.01  | <1 | 162   | <1 | 162   | 1,210 | 1,220 | 38,600 | 0.23 | 5,650 | 1,100 | 2,680 | 1,030 | 21,000 |
| MW144         | 0960_MW144_3-3.5_220622   | 22/06/2022 | Normal             | EP2207731         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01  | <0.01  | <1 | 207   | <1 | 207   | 432   | 430   | 12,800 | 0.26 | 3,220 | 773   | 925   | 474   | 6,970  |
| MW145         | 0960_MW145_3-3.5_220622   | 22/06/2022 | Normal             | EP2207731         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01  | <0.01  | <1 | 130   | <1 | 130   | 1,350 | 1,340 | 43,300 | 0.17 | 5,950 | 1,100 | 2,940 | 1,120 | 23,400 |
| MW146         | 0960_MW146_3-3.5_220622   | 22/06/2022 | Normal             | EP2207731         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01  | <0.01  | <1 | 133   | <1 | 133   | 1,310 | 1,340 | 41,800 | 1.32 | 6,000 | 1,110 | 2,910 | 1,130 | 23,400 |
| MW147         | 0960_MW147                |            |                    |                   |        |        |        |        |        |        |        |        |        |    |       |    |       |       |       |        |      |       |       |       |       |        |

|                                   | PFAS - Perfluoroalkyl Sulfonamides |                                               |                                                           |                                                      |                                              |                                                          |                                                     | PFAS                  |             | Inorganics                      |                                   |                                 |                             |              |               |          |               | Metals                                     |                    |                      |                      |
|-----------------------------------|------------------------------------|-----------------------------------------------|-----------------------------------------------------------|------------------------------------------------------|----------------------------------------------|----------------------------------------------------------|-----------------------------------------------------|-----------------------|-------------|---------------------------------|-----------------------------------|---------------------------------|-----------------------------|--------------|---------------|----------|---------------|--------------------------------------------|--------------------|----------------------|----------------------|
|                                   | Perfluorooctane sulfonamide (FOSA) | N-Methyl perfluorooctane sulfonamide (MeFOSA) | N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | N-methyl perfluorooctane sulfonamidoethanol (MeFOSE) | N-Ethyl perfluorooctane sulfonamide (EtFOSA) | N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA) | N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE) | Sum of PFHxS and PFOS | Sum of PFAS | Carbonate Alkalinity (as CaCO3) | Alkalinity (Bicarbonate as CaCO3) | Alkalinity (Hydroxide) as CaCO3 | Alkalinity (total) as CaCO3 | Anions Total | Cations Total | Chloride | Ionic Balance | Sulphate as SO4 - Turbidimetric (filtered) | Calcium (filtered) | Magnesium (filtered) | Potassium (filtered) |
|                                   | µg/L                               | µg/L                                          | µg/L                                                      | µg/L                                                 | µg/L                                         | µg/L                                                     | µg/L                                                | µg/L                  | µg/L        | mg/L                            | mg/L                              | mg/L                            | mg/L                        | meq/L        | meq/L         | mg/L     | %             | mg/L                                       | mg/L               | mg/L                 | mg/L                 |
| LOR - Limit of Reporting          | 0.004                              | 0.004                                         | 0.004                                                     | 0.008                                                | 0.004                                        | 0.004                                                    | 0.008                                               | 0.002                 | 0.001       | 1                               | 1                                 | 1                               | 1                           | 0.01         | 0.01          | 1        | 0.01          | 1                                          | 1                  | 1                    | 1                    |
| PFAS NEMP 2020 Interim Marine 99% |                                    |                                               |                                                           |                                                      |                                              |                                                          |                                                     | 2                     |             |                                 |                                   |                                 |                             |              |               |          |               |                                            |                    |                      |                      |
| PFAS NEMP 2020 Recreational Water |                                    |                                               |                                                           |                                                      |                                              |                                                          |                                                     |                       |             |                                 |                                   |                                 |                             |              |               |          |               |                                            |                    |                      |                      |

| Location Code | Field ID                | Date       | Sample Type        | Lab Report Number |        |        |        |        |        |        |        |       |       |    |     |    |     |       |       |        |      |       |       |       |       |        |
|---------------|-------------------------|------------|--------------------|-------------------|--------|--------|--------|--------|--------|--------|--------|-------|-------|----|-----|----|-----|-------|-------|--------|------|-------|-------|-------|-------|--------|
| MW167         | 0960_MW167_220622       | 22/06/2022 | Normal             | EP2207737         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | 2.07  | 2.80  | <1 | 917 | <1 | 917 | 51.9  | 47.5  | 950    | 4.40 | 324   | 26    | 30    | 48    | 977    |
| MW168         | 0960_MW168_220622       | 22/06/2022 | Normal             | EP2207737         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | 0.54  | 0.83  | <1 | 603 | <1 | 603 | 127   | 122   | 3,580  | 1.88 | 681   | 165   | 192   | 109   | 2,200  |
| MW170         | 0960_MW170_220622       | 22/06/2022 | Normal             | EP2207727         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | 0.47  | 0.67  | <1 | 204 | <1 | 204 | 434   | 481   | 14,100 | 5.10 | 1,570 | 742   | 947   | 222   | 8,290  |
| MW172         | 0960_MW172_220622       | 22/06/2022 | Normal             | EP2207727         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | 6.30  | 11.4  | <1 | 275 | <1 | 275 | 361   | 412   | 10,800 | 6.62 | 2,450 | 499   | 692   | 269   | 7,440  |
| MW175         | 0960_MW175_4-4.5_220622 | 23/06/2022 | Normal             | EP2207814         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01 | <0.01 | <1 | 431 | <1 | 431 | 33.9  | 29.7  | 864    | 6.61 | 46    | 47    | 151   | 39    | 321    |
| MW176         | 0960_MW176_1.5-2_220622 | 23/06/2022 | Normal             | EP2207814         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01 | <0.01 | <1 | 224 | <1 | 224 | 588   | 650   | 18,400 | 4.97 | 3,120 | 653   | 1,540 | 647   | 10,900 |
| MW177         | 0960_MW177_1.5-2_220622 | 23/06/2022 | Normal             | EP2207814         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01 | <0.01 | <1 | 162 | <1 | 162 | 1,220 | 1,240 | 39,800 | 0.91 | 4,610 | 982   | 2,840 | 1,030 | 21,500 |
| MW178         | 0960_MW178_2-2.5_220622 | 23/06/2022 | Normal             | EP2207814         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01 | <0.01 | <1 | 147 | <1 | 147 | 1,300 | 1,340 | 41,600 | 1.56 | 6,010 | 1,240 | 2,960 | 1,100 | 23,200 |
| MW179         | 0960_MW179_1-1.5_220622 | 22/06/2022 | Normal             | EP2207737         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01 | <0.01 | <1 | 184 | <1 | 184 | 1,080 | 1,090 | 35,300 | 0.20 | 4,140 | 676   | 2,430 | 994   | 19,100 |
| MW180         | 0960_MW180_1-1.5_230622 | 23/06/2022 | Normal             | EP2207810         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01 | <0.01 | <1 | 230 | <1 | 230 | 996   | 1,140 | 32,000 | 6.54 | 4,290 | 755   | 2,500 | 1,230 | 19,800 |
| MW181         | 0960_MW181_3.5-4_230622 | 23/06/2022 | Normal             | EP2207810         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01 | <0.01 | <1 | 153 | <1 | 153 | 1,130 | 1,340 | 36,500 | 8.20 | 4,840 | 1,030 | 2,950 | 1,110 | 23,300 |
| MW211         | 0960_MW211_220622       | 22/06/2022 | Normal             | EP2207737         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | 5.01  | 5.65  | 26 | 620 | <1 | 646 | 17.8  | 17.3  | 132    | 1.49 | 59    | 3     | 5     | 18    | 375    |
| MW233         | 0960_MW233_220622       | 22/06/2022 | Normal             | EP2207731         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | 2.63  | 3.55  | 3  | 580 | <1 | 584 | 18.9  | 15.6  | 226    | 9.46 | 41    | 3     | 3     | 14    | 342    |
| MW238         | 0960_MW238_220622       | 22/06/2022 | Normal             | EP2207727         | 0.03   | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | 20.2  | 29.9  | <1 | 835 | <1 | 835 | 57.5  | 54.9  | 649    | 2.31 | 1,080 | 18    | 32    | 69    | 1,140  |
| OTH103        | 0960_OTH103_220623      | 23/06/2022 | Normal             | EP2207816         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01 | <0.01 | <1 | 150 | <1 | 150 | 571   | 682   | 18,300 | 8.86 | 2,480 | 505   | 1,590 | 661   | 11,700 |
| OTH106        | 0960_OTH106_220623      | 23/06/2022 | Normal             | EP2207812         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01 | <0.01 | <1 | 121 | <1 | 121 | 579   | 570   | 18,400 | 0.75 | 2,750 | 414   | 1,340 | 553   | 9,770  |
| OTH107        | 0960_OTH107_220623      | 23/06/2022 | Normal             | EP2207812         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01 | <0.01 | <1 | 118 | <1 | 118 | 575   | 641   | 18,300 | 5.43 | 2,720 | 470   | 1,500 | 623   | 11,000 |
| OTH129        | 0960_OTH129_220623      | 23/06/2022 | Normal             | EP2207816         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01 | <0.01 | <1 | 146 | <1 | 146 | 606   | 682   | 19,500 | 5.87 | 2,570 | 516   | 1,590 | 652   | 11,700 |
| OTH132        | 0960_OTH132_220623      | 23/06/2022 | Normal             | EP2207812         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01 | <0.01 | <1 | 154 | <1 | 154 | 592   | 677   | 18,800 | 6.73 | 2,810 | 496   | 1,590 | 672   | 11,600 |
| OTH134        | 0960_OTH134_220623      | 23/06/2022 | Normal             | EP2207812         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | 0.13  | 0.13  | <1 | 101 | <1 | 101 | 24.2  | 22.3  | 713    | 4.11 | 99    | 36    | 51    | 28    | 358    |
| SW001         | 0960_SW001_220623       | 23/06/2022 | Normal             | EP2207816         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01 | <0.01 | 24 | 122 | <1 | 146 | 575   | 657   | 18,200 | 6.63 | 2,820 | 429   | 1,560 | 603   | 11,300 |
| SW108         | 0960_SW108_220622       | 22/06/2022 | Normal             | EP2207728         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | 0.17  | 0.17  | <1 | 90  | <1 | 90  | 2.13  | 1.99  | 8      | 3.24 | 5     | 22    | 3     | 5     | 12     |
| SW157         | 0960_SW157_220622       | 22/06/2022 | Normal             | EP2207728         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | 0.15  | 0.15  | 7  | 56  | <1 | 63  | 7.36  | 6.17  | 203    | 8.80 | 18    | 18    | 8     | 12    | 99     |
| SW170         | 0960_SW170_220622       | 22/06/2022 | Normal             | EP2207728         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | 0.08  | 0.08  | <1 | 82  | <1 | 82  | 1.90  | 1.72  | 8      | 4.95 | 2     | 22    | 3     | 3     | 7      |
| SW189         | 0960_QC126_220623       | 23/06/2022 | Field Duplicate    | EP2207812         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | 0.14  | 0.14  | <1 | 67  | <1 | 67  | 10.7  | 9.23  | 310    | 7.49 | 31    | 21    | 15    | 15    | 151    |
| SW189         | 0960_QC226_220623       | 23/06/2022 | Interlab Duplicate | 901145            | <0.004 | <0.004 | <0.004 | <0.008 | <0.004 | <0.004 | <0.008 | 0.066 | 0.071 |    |     |    |     |       |       |        |      |       |       |       |       |        |
| SW189         | 0960_SW189_220623       | 23/06/2022 | Normal             | EP2207812         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | 0.14  | 0.14  | <1 | 69  | <1 | 69  | 10.7  | 9.32  | 310    | 7.11 | 30    | 21    | 15    | 15    | 153    |
| SW190         | 0960_SW190_220623       | 23/06/2022 | Normal             | EP2207812         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | 0.22  | 0.22  | 2  | 98  | <1 | 100 | 10.4  | 9.12  | 251    | 6.43 | 62    | 32    | 18    | 15    | 130    |
| SW192         | 0960_SW192_220623       | 23/06/2022 | Normal             | EP2207816         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | 0.18  | 0.18  | <1 | 102 | <1 | 102 | 90.3  | 92.2  | 2,840  | 1.07 | 390   | 80    | 201   | 99    | 1,590  |
| SW193         | 0960_SW193_220623       | 23/06/2022 | Normal             | EP2207816         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | 0.19  | 0.19  | <1 | 93  | <1 | 93  | 21.6  | 18.8  | 638    | 6.71 | 82    | 35    | 38    | 26    | 306    |
| SW199         | 0960_SW199_220622       | 22/06/2022 | Normal             | EP2207732         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01 | <0.01 | <1 | 128 | <1 | 128 | 2.64  | 2.55  | 3      | 1.72 | <1    | 38    | 4     | 6     | 4      |
| SW200         | 0960_SW200_220622       | 22/06/2022 | Normal             | EP2207732         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01 | <0.01 | <1 | 67  | <1 | 67  | 1.46  | 1.30  | 2      | 5.88 | 3     | 18    | 2     | 4     | 3      |
| SW205         | 0960_SW205_220623       | 23/06/2022 | Normal             | EP2207812         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01 | <0.01 | <1 | 278 | <1 | 278 | 746   | 781   | 23,600 | 2.32 | 3,570 | 531   | 1,810 | 719   | 13,500 |
| SW207         | 0960_SW207_220623       | 23/06/2022 | Normal             | EP2207812         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01 | <0.01 | <1 | 185 | <1 | 185 | 573   | 636   | 18,200 | 5.27 | 2,670 | 481   | 1,490 | 612   | 10,900 |
| SW208         | 0960_SW208_220623       | 23/06/2022 | Normal             | EP2207812         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01 | <0.01 | <1 | 129 | <1 | 129 | 587   | 617   | 18,700 | 2.53 | 2,720 | 447   | 1,440 | 599   | 10,600 |
| SW209         | 0960_SW209_220622       | 22/06/2022 | Normal             | EP2207739         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01 | <0.01 | <1 | 162 | <1 | 162 | 390   | 403   | 12,600 | 1.53 | 1,530 | 315   | 953   | 413   | 6,850  |
| SW210         | 0960_SW210_220622       | 22/06/2022 | Normal             | EP2207739         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | 0.04  | 0.04  | <1 | 191 | <1 | 191 | 402   | 447   | 12,800 | 5.28 | 1,800 | 342   | 1,060 | 448   | 7,620  |
| SW211         | 0960_SW211_220623       | 23/06/2022 | Normal             | EP2207816         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | <0.01 | <0.01 | <1 | 219 | <1 | 219 | 348   | 362   | 10,900 | 2.03 | 1,740 | 294   | 856   | 336   | 6,180  |
| SW227         | 0960_SW227_220622       | 22/06/2022 | Normal             | EP2207732         | <0.02  | <0.05  | <0.02  | <0.05  | <0.05  | <0.02  | <0.05  | 0.11  | 0.11  | <1 | 100 | <1 | 100 | 2.38  | 2.20  | 9      | 3.85 | 6     | 27    | 3     | 5     | 11     |
| SW265         | 0960_QC121_2            |            |                    |                   |        |        |        |        |        |        |        |       |       |    |     |    |     |       |       |        |      |       |       |       |       |        |



|                                               | PFAS - Perfluoroalkyl Sulfonic Acids |                                        |                                       |                                        |                                      |                                      | PFAS - Perfluoroalkyl Carboxylic Acids |                                 |                                |                                 |                               |                               |                               |                                   |                                   |
|-----------------------------------------------|--------------------------------------|----------------------------------------|---------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|----------------------------------------|---------------------------------|--------------------------------|---------------------------------|-------------------------------|-------------------------------|-------------------------------|-----------------------------------|-----------------------------------|
|                                               | Perfluorobutane sulfonic acid (PFBS) | Perfluoropentane sulfonic acid (PFPeS) | Perfluorohexane sulfonic acid (PFHxS) | Perfluoroheptane sulfonic acid (PFHpS) | Perfluorooctane sulfonic acid (PFOS) | Perfluorodecane sulfonic acid (PFDS) | Perfluorobutanoic acid (PFBA)          | Perfluoropentanoic acid (PFPeA) | Perfluorohexanoic acid (PFHxA) | Perfluoroheptanoic acid (PFHpA) | Perfluorooctanoic acid (PFOA) | Perfluorononanoic acid (PFNA) | Perfluorodecanoic acid (PFDA) | Perfluoroundecanoic acid (PFUnDA) | Perfluorododecanoic acid (PFDoDA) |
| LOR - Limit of Reporting                      | 0.0002                               | 0.0002                                 | 0.0002                                | 0.0002                                 | 0.0002                               | 0.0002                               | 0.0008                                 | 0.0002                          | 0.0002                         | 0.0002                          | 0.0002                        | 0.0002                        | 0.0002                        | 0.0002                            | 0.0002                            |
| PFAS NEMP 2020 Ecological direct exposure     |                                      |                                        |                                       |                                        | 1                                    |                                      |                                        |                                 |                                |                                 | 10                            |                               |                               |                                   |                                   |
| PFAS NEMP 2020 Ecological indirect exposure   |                                      |                                        |                                       |                                        | 0.01                                 |                                      |                                        |                                 |                                |                                 |                               |                               |                               |                                   |                                   |
| PFAS NEMP 2020 Industrial/ commercial (HIL D) |                                      |                                        |                                       |                                        |                                      |                                      |                                        |                                 |                                |                                 | 50                            |                               |                               |                                   |                                   |

| Location Code | Field ID          | Date       | Sample Type        | Lab Report Number |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
|---------------|-------------------|------------|--------------------|-------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| SD199         | 0960_SD199_220622 | 22/06/2022 | Normal             | EP2207733         | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.001  | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| SD200         | 0960_SD200_220622 | 22/06/2022 | Normal             | EP2207733         | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.001  | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| SD205         | 0960_SD205_220623 | 23/06/2022 | Normal             | EP2207813         | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.001  | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| SD207         | 0960_SD207_220623 | 23/06/2022 | Normal             | EP2207813         | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.001  | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| SD208         | 0960_QC127_220623 | 23/06/2022 | Field Duplicate    | EP2207813         | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.001  | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| SD208         | 0960_QC227_220623 | 23/06/2022 | Interlab Duplicate | 901145            | <0.0004 | <0.0004 | <0.0004 | <0.0004 | <0.0004 | <0.0004 | <0.0008 | <0.0002 | <0.0004 | <0.0008 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| SD208         | 0960_SD208_220623 | 23/06/2022 | Normal             | EP2207813         | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.001  | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| SD209         | 0960_SD209_220622 | 22/06/2022 | Normal             | EP2207738         | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.001  | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| SD210         | 0960_SD210_220622 | 22/06/2022 | Normal             | EP2207738         | <0.0002 | <0.0002 | <0.0002 | <0.0002 | 0.0011  | <0.0002 | <0.001  | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| SD211         | 0960_SD211_220623 | 23/06/2022 | Normal             | EP2207815         | <0.0002 | <0.0002 | <0.0002 | <0.0002 | 0.0010  | <0.0002 | <0.001  | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| SD219         | 0960_SD219_220622 | 22/06/2022 | Normal             | EP2207729         | <0.0002 | <0.0002 | <0.0002 | <0.0002 | 0.0086  | 0.0007  | <0.001  | <0.0002 | <0.0002 | <0.0002 | <0.0002 | 0.0003  | <0.0002 | <0.0002 |
| SD300         | 0960_SD300_220623 | 23/06/2022 | Normal             | EP2207815         | 0.0002  | 0.0004  | 0.0022  | <0.0002 | 0.0012  | <0.0002 | <0.001  | <0.0002 | 0.0008  | 0.0002  | 0.0003  | <0.0002 | <0.0002 | <0.0002 |
| SD301         | 0960_SD301_220623 | 23/06/2022 | Normal             | EP2207815         | <0.0002 | <0.0002 | <0.0002 | 0.0003  | <0.0002 | <0.0002 | <0.001  | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| SD302         | 0960_SD302_220622 | 22/06/2022 | Normal             | EP2207738         | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.001  | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| SD303         | 0960_SD303_220623 | 23/06/2022 | Normal             | EP2207815         | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.001  | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| SD304         | 0960_SD304_220623 | 23/06/2022 | Normal             | EP2207815         | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.001  | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| SD305         | 0960_SD305_220623 | 23/06/2022 | Normal             | EP2207815         | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.001  | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| SS108         | 0960_SS108_220622 | 22/06/2022 | Normal             | EP2207729         | <0.0002 | <0.0002 | <0.0002 | <0.0002 | 0.0207  | <0.0002 | <0.001  | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| SS113         | 0960_SS113_220622 | 22/06/2022 | Normal             | EP2207729         | <0.0002 | <0.0002 | <0.0002 | <0.0002 | 0.0021  | <0.0002 | <0.001  | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| SS114         | 0960_SS114_220622 | 22/06/2022 | Normal             | EP2207729         | <0.0002 | <0.0002 | <0.0002 | <0.0002 | 0.0265  | 0.0021  | <0.001  | <0.0002 | <0.0002 | <0.0002 | <0.0002 | 0.0002  | <0.0002 | <0.0002 |
| SS121         | 0960_SS121_220622 | 22/06/2022 | Normal             | EP2207738         | <0.0002 | <0.0002 | <0.0002 | <0.0002 | 0.0110  | <0.0002 | <0.001  | <0.0002 | <0.0002 | <0.0002 | 0.0005  | 0.0004  | <0.0002 | <0.0002 |
| SS122         | 0960_SS122_220622 | 22/06/2022 | Normal             | EP2207738         | 0.0003  | <0.0002 | 0.0006  | <0.0002 | 0.0016  | <0.0002 | <0.001  | 0.0004  | 0.0021  | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| SS123         | 0960_QC118_220622 | 22/06/2022 | Field Duplicate    | EP2207733         | <0.0002 | <0.0002 | <0.0002 | <0.0002 | 0.0313  | 0.0013  | <0.001  | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| SS123         | 0960_QC218_220622 | 22/06/2022 | Interlab Duplicate | 901145            | <0.0004 | <0.0004 | <0.0004 | <0.0004 | 0.029   | <0.0004 | <0.0008 | <0.0002 | <0.0004 | <0.0008 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| SS123         | 0960_SD123_220622 | 22/06/2022 | Normal             | EP2207733         | <0.0002 | <0.0002 | 0.0003  | <0.0002 | 0.0384  | 0.0016  | <0.001  | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| SS124         | 0960_SS124_220622 | 22/06/2022 | Normal             | EP2207729         | <0.0002 | <0.0002 | <0.0002 | <0.0002 | 0.365   | 0.0015  | <0.001  | <0.0002 | <0.0002 | <0.0002 | 0.0028  | 0.0008  | 0.0003  | 0.0002  |
| SS125         | 0960_SS125_220622 | 22/06/2022 | Normal             | EP2207729         | <0.0002 | <0.0002 | <0.0002 | <0.0002 | 0.0008  | <0.0002 | <0.001  | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| SS157         | 0960_SS157_220622 | 22/06/2022 | Normal             | EP2207729         | <0.0002 | <0.0002 | <0.0002 | <0.0002 | 0.0075  | <0.0002 | <0.001  | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| SS166         | 0960_SS166_220622 | 22/06/2022 | Normal             | EP2207729         | <0.0002 | <0.0002 | <0.0002 | <0.0002 | 0.0013  | <0.0002 | <0.001  | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| SS168         | 0960_SS168_220622 | 22/06/2022 | Normal             | EP2207729         | <0.0002 | <0.0002 | <0.0002 | <0.0002 | 0.0014  | <0.0002 | <0.001  | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| SS170         | 0960_SS170_220622 | 22/06/2022 | Normal             | EP2207729         | <0.0002 | <0.0002 | <0.0002 | <0.0002 | 0.0055  | 0.0007  | <0.001  | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| SS174         | 0960_SS174_220622 | 22/06/2022 | Normal             | EP2207729         | <0.0002 | <0.0002 | <0.0002 | <0.0002 | 0.0047  | <0.0002 | <0.001  | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| SS176         | 0960_SS176_220622 | 22/06/2022 | Normal             | EP2207729         | <0.0002 | <0.0002 | <0.0002 | <0.0002 | 0.0005  | <0.0002 | <0.001  | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| SS189         | 0960_SS189_220623 | 23/06/2022 | Normal             | EP2207813         | <0.0002 | <0.0002 | <0.0002 | <0.0002 | 0.0040  | <0.0002 | <0.001  | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| SS190         | 0960_SS190_220623 | 23/06/2022 | Normal             | EP2207815         | <0.0002 | <0.0002 | <0.0002 | <0.0002 | 0.0027  | 0.0015  | <0.001  | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| SS192         | 0960_SS192_220623 | 23/06/2022 | Normal             | EP2207815         | <0.0002 | <0.0002 | <0.0002 | <0.0002 | 0.0046  | <0.0002 | <0.001  | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| SS193         | 0960_SS193_220623 | 23/06/2022 | Normal             | EP2207815         | <0.0002 | <0.0002 | <0.0002 | <0.0002 | 0.0026  | <0.0002 | <0.001  | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| SS198         | 0960_SS198_220622 | 22/06/2022 | Normal             | EP2207733         | <0.0002 | <0.0002 | <0.0002 | <0.0002 | 0.0016  | <0.0002 | <0.001  | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| SS227         | 0960_QC123_220622 | 22/06/2022 | Field Duplicate    | EP2207733         | <0.0002 | <0.0002 | <0.0002 | <0.0002 | 0.0081  | <0.0002 | <0.001  | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| SS227         | 0960_QC223_220622 | 22/06/2022 | Interlab Duplicate | 901145            | <0.0004 | <0.0004 | 0.0013  | <0.0004 | 0.0099  | <0.0004 | <0.0008 | <0.0002 | <0.0004 | <0.0008 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| SS227         | 0960_SS227_220622 | 22/06/2022 | Normal             | EP2207733         | <0.0002 | <0.0002 | <0.0002 | <0.0002 | 0.0041  | <0.0002 | <0.001  | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| SS231         | 0960_SS231_220622 | 22/06/2022 | Normal             | EP2207729         | <0.0002 | <0.0002 | <0.0002 | <0.0002 | 0.0044  | <0.0002 | <0.001  | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| SS234         | 0960_SS234_220622 | 22/06/2022 | Normal             | EP2207729         | <0.0002 | <0.0002 | 0.0012  | <0.0002 | 0.0333  | <0.0002 | <0.001  | <0.0002 | 0.0002  | <0.0002 | 0.0004  | 0.0004  | <0.0002 | <0.0002 |
| SS235         | 0960_SS235_220622 | 22/06/2022 | Normal             | EP2207729         | <0.0002 | <0.0002 | <0.0002 | <0.0002 | 0.0184  | <0.0002 | <0.001  | <0.0002 | <0.0002 | <0.0002 | 0.0002  | 0.0004  | <0.0002 | <0.0002 |
| SS243         | 0960_SS243_220622 | 22/06/2022 | Normal             | EP2207729         | <0.0002 | <0.0002 | <0.0002 | <0.0002 | 0.0135  | <0.0002 | <0.001  | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| SS265         | 0960_SS265_220622 | 22/06/2022 | Normal             | EP220772          |         |         |         |         |         |         |         |         |         |         |         |         |         |         |



[illegible]

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

| Field ID<br>Date<br>Matrix Type<br>Lab Report Number      |      |       | 0960_MW166_220622 | 0960_QC115_220622 | RPD | 0960_MW166_220622 | 0960_QC215_220622 | RPD | 0960_MW018_220622 | 0960_QC117_220622 | RPD | 0960_MW018_220622 | 0960_QC217_220622 | RPD |
|-----------------------------------------------------------|------|-------|-------------------|-------------------|-----|-------------------|-------------------|-----|-------------------|-------------------|-----|-------------------|-------------------|-----|
|                                                           |      |       | 22/06/2022        | 22/06/2022        |     | 22/06/2022        | 22/06/2022        |     | 22/06/2022        | 22/06/2022        |     |                   |                   |     |
|                                                           |      |       | Water             | Water             |     | Water             | Water             |     | Water             | Water             |     |                   |                   |     |
|                                                           |      |       | EP2207737         | EP2207737         |     | EP2207737         | 901145            |     | EP2207731         | EP2207731         |     | EP2207731         | 901145            |     |
|                                                           | Unit | LOR   |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| PFAS - Perfluoroalkyl Sulfonic Acids                      |      |       |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| Perfluorobutane sulfonic acid (PFBS)                      | µg/L | 0.002 | <0.02             | 0.03              | 40  | <0.02             | 0.048             | 82  | 0.06              | 0.05              | 18  | 0.06              | 0.056             | 7   |
| Perfluoropentane sulfonic acid (PFPeS)                    | µg/L | 0.002 | <0.02             | 0.02              | 0   | <0.02             | 0.045             | 77  | 0.08              | 0.07              | 13  | 0.08              | 0.077             | 4   |
| Perfluorohexane sulfonic acid (PFHxS)                     | µg/L | 0.002 | 0.07              | 0.21              | 100 | 0.07              | 0.071             | 1   | 1.14              | 1.03              | 10  | 1.14              | 0.46              | 85  |
| Perfluoroheptane sulfonic acid (PFHpS)                    | µg/L | 0.002 | <0.02             | <0.02             | 0   | <0.02             | 0.010             | 0   | 0.05              | 0.04              | 22  | 0.05              | 0.030             | 50  |
| Perfluorooctane sulfonic acid (PFOS)                      | µg/L | 0.004 | 0.07              | 0.22              | 103 | 0.07              | 0.082             | 16  | 0.55              | 0.52              | 6   | 0.55              | 0.16              | 110 |
| Perfluorodecane sulfonic acid (PFDS)                      | µg/L | 0.004 | <0.02             | <0.02             | 0   | <0.02             | <0.004            | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.004            | 0   |
| PFAS - Perfluoroalkyl Carboxylic Acids                    |      |       |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| Perfluorobutanoic acid (PFBA)                             | µg/L | 0.008 | <0.1              | <0.1              | 0   | <0.1              | 0.089             | 0   | 0.8               | 0.7               | 13  | 0.8               | 0.64              | 22  |
| Perfluoropentanoic acid (PFPeA)                           | µg/L | 0.002 | <0.02             | 0.06              | 100 | <0.02             | 0.042             | 71  | 1.92              | 1.72              | 11  | 1.92              | 1.0               | 63  |
| Perfluorohexanoic acid (PFHxA)                            | µg/L | 0.001 | 0.03              | 0.09              | 100 | 0.03              | 0.037             | 21  | 1.89              | 1.70              | 11  | 1.89              | 0.82              | 79  |
| Perfluoroheptanoic acid (PFHpA)                           | µg/L | 0.004 | <0.02             | 0.05              | 86  | <0.02             | 0.10              | 133 | 0.79              | 0.68              | 15  | 0.79              | 0.29              | 93  |
| Perfluorooctanoic acid (PFOA)                             | µg/L | 0.001 | 0.01              | 0.05              | 133 | 0.01              | 0.085             | 158 | 0.09              | 0.08              | 12  | 0.09              | 0.072             | 22  |
| Perfluorononanoic acid (PFNA)                             | µg/L | 0.002 | <0.02             | <0.02             | 0   | <0.02             | 0.014             | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.002            | 0   |
| Perfluorodecanoic acid (PFDA)                             | µg/L | 0.001 | <0.02             | <0.02             | 0   | <0.02             | 0.004             | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.001            | 0   |
| Perfluoroundecanoic acid (PFUnDA)                         | µg/L | 0.001 | <0.02             | <0.02             | 0   | <0.02             | <0.001            | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.001            | 0   |
| Perfluorododecanoic acid (PFDoDA)                         | µg/L | 0.001 | <0.02             | <0.02             | 0   | <0.02             | <0.001            | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.001            | 0   |
| Perfluorotridecanoic acid (PFTrDA)                        | µg/L | 0.001 | <0.02             | <0.02             | 0   | <0.02             | <0.001            | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.001            | 0   |
| Perfluorotetradecanoic acid (PFTeDA)                      | µg/L | 0.001 | <0.05             | <0.05             | 0   | <0.05             | <0.001            | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.001            | 0   |
| PFAS - (n:2) Fluorotelomer Sulfonic Acids                 |      |       |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | µg/L | 0.008 | <0.05             | <0.05             | 0   | <0.05             | <0.008            | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.008            | 0   |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | µg/L | 0.008 | <0.05             | <0.05             | 0   | <0.05             | <0.008            | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.008            | 0   |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | µg/L | 0.002 | <0.05             | <0.05             | 0   | <0.05             | <0.002            | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.002            | 0   |
| 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | µg/L | 0.004 | <0.05             | <0.05             | 0   | <0.05             | <0.004            | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.004            | 0   |
| PFAS - Perfluoroalkyl Sulfonamides                        |      |       |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| Perfluorooctane sulfonamide (FOSA)                        | µg/L | 0.004 | <0.02             | <0.02             | 0   | <0.02             | <0.004            | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.004            | 0   |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)             | µg/L | 0.004 | <0.05             | <0.05             | 0   | <0.05             | <0.004            | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.004            | 0   |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | µg/L | 0.004 | <0.02             | <0.02             | 0   | <0.02             | <0.004            | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.004            | 0   |
| N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | µg/L | 0.008 | <0.05             | <0.05             | 0   | <0.05             | <0.008            | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.008            | 0   |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | µg/L | 0.004 | <0.05             | <0.05             | 0   | <0.05             | <0.004            | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.004            | 0   |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | µg/L | 0.004 | <0.02             | <0.02             | 0   | <0.02             | <0.004            | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.004            | 0   |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | µg/L | 0.008 | <0.05             | <0.05             | 0   | <0.05             | <0.008            | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.008            | 0   |
| Perfluorooctane sulfonamidoacetic acid (FOSAA)            | µg/L | 0.002 |                   |                   |     |                   | <0.002            |     |                   |                   |     |                   | <0.002            |     |
| PFAS                                                      |      |       |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| Sum of PFHxS and PFOS                                     | µg/L | 0.002 | 0.14              | 0.43              | 102 | 0.14              | 0.15              | 7   | 1.69              | 1.55              | 9   | 1.69              | 0.62              | 93  |
| Sum of PFAS                                               | µg/L | 0.001 | 0.18              | 0.73              | 121 | 0.18              | 0.63              | 111 | 7.37              | 6.59              | 11  | 7.37              | 3.7               | 66  |

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

| Field ID<br>Date<br>Matrix Type<br>Lab Report Number      |      |       | 0960_MW148S_220622 |       | 0960_QC116_220622 |       | RPD    | 0960_MW148S_220622 |       | 0960_QC216_220622 |    | RPD   | 0960_MW105_220622 |     | 0960_QC119_220622 |  | RPD | 0960_MW105_220622 |  | 0960_QC219_220622 |  | RPD |
|-----------------------------------------------------------|------|-------|--------------------|-------|-------------------|-------|--------|--------------------|-------|-------------------|----|-------|-------------------|-----|-------------------|--|-----|-------------------|--|-------------------|--|-----|
|                                                           |      |       | 22/06/2022         |       | 22/06/2022        |       |        | 22/06/2022         |       | 22/06/2022        |    |       | 22/06/2022        |     | 22/06/2022        |  |     | 22/06/2022        |  |                   |  |     |
|                                                           |      |       | Water              |       | Water             |       |        | Water              |       | Water             |    |       | Water             |     | Water             |  |     | Water             |  |                   |  |     |
|                                                           |      |       | EP2207727          |       | EP2207727         |       |        | EP2207727          |       | 901145            |    |       | EP2207727         |     | EP2207727         |  |     | EP2207727         |  | 901145            |  |     |
|                                                           | Unit | LOR   |                    |       |                   |       |        |                    |       |                   |    |       |                   |     |                   |  |     |                   |  |                   |  |     |
| PFAS - Perfluoroalkyl Sulfonic Acids                      |      |       |                    |       |                   |       |        |                    |       |                   |    |       |                   |     |                   |  |     |                   |  |                   |  |     |
| Perfluorobutane sulfonic acid (PFBS)                      | µg/L | 0.002 | 8.61               | 7.88  | 9                 | 8.61  | 0.95   | 160                | 0.18  | 0.15              | 18 | 0.18  | 0.15              | 18  |                   |  |     |                   |  |                   |  |     |
| Perfluoropentane sulfonic acid (PFPeS)                    | µg/L | 0.002 | 6.34               | 6.35  | 0                 | 6.34  | 0.67   | 162                | 0.20  | 0.20              | 0  | 0.20  | 0.20              | 0   |                   |  |     |                   |  |                   |  |     |
| Perfluorohexane sulfonic acid (PFHxS)                     | µg/L | 0.002 | 28.4               | 28.1  | 1                 | 28.4  | 2.7    | 165                | 0.92  | 0.86              | 7  | 0.92  | 0.11              | 157 |                   |  |     |                   |  |                   |  |     |
| Perfluoroheptane sulfonic acid (PFHpS)                    | µg/L | 0.002 | 2.37               | 2.33  | 2                 | 2.37  | 0.13   | 179                | <0.02 | <0.02             | 0  | <0.02 | 0.006             | 0   |                   |  |     |                   |  |                   |  |     |
| Perfluorooctane sulfonic acid (PFOS)                      | µg/L | 0.004 | 21.2               | 20.6  | 3                 | 21.2  | 0.99   | 182                | 0.04  | 0.05              | 22 | 0.04  | 0.034             | 16  |                   |  |     |                   |  |                   |  |     |
| Perfluorodecane sulfonic acid (PFDS)                      | µg/L | 0.004 | <0.02              | <0.02 | 0                 | <0.02 | <0.004 | 0                  | <0.02 | <0.02             | 0  | <0.02 | <0.004            | 0   |                   |  |     |                   |  |                   |  |     |
| PFAS - Perfluoroalkyl Carboxylic Acids                    |      |       |                    |       |                   |       |        |                    |       |                   |    |       |                   |     |                   |  |     |                   |  |                   |  |     |
| Perfluorobutanoic acid (PFBA)                             | µg/L | 0.008 | 1.6                | 1.5   | 6                 | 1.6   | <0.008 | 198                | <0.1  | <0.1              | 0  | <0.1  | 0.044             | 0   |                   |  |     |                   |  |                   |  |     |
| Perfluoropentanoic acid (PFPeA)                           | µg/L | 0.002 | 2.38               | 2.27  | 5                 | 2.38  | 0.20   | 169                | 0.04  | 0.04              | 0  | 0.04  | 0.025             | 46  |                   |  |     |                   |  |                   |  |     |
| Perfluorohexanoic acid (PFHxA)                            | µg/L | 0.001 | 9.52               | 9.15  | 4                 | 9.52  | 0.97   | 163                | 0.19  | 0.17              | 11 | 0.19  | 0.017             | 167 |                   |  |     |                   |  |                   |  |     |
| Perfluoroheptanoic acid (PFHpA)                           | µg/L | 0.004 | 1.22               | 1.12  | 9                 | 1.22  | 0.10   | 170                | <0.02 | <0.02             | 0  | <0.02 | <0.004            | 0   |                   |  |     |                   |  |                   |  |     |
| Perfluorooctanoic acid (PFOA)                             | µg/L | 0.001 | 1.67               | 1.60  | 4                 | 1.67  | 0.25   | 148                | 0.01  | 0.01              | 0  | 0.01  | 0.014             | 33  |                   |  |     |                   |  |                   |  |     |
| Perfluorononanoic acid (PFNA)                             | µg/L | 0.002 | <0.02              | <0.02 | 0                 | <0.02 | 0.007  | 0                  | <0.02 | <0.02             | 0  | <0.02 | <0.002            | 0   |                   |  |     |                   |  |                   |  |     |
| Perfluorodecanoic acid (PFDA)                             | µg/L | 0.001 | <0.02              | <0.02 | 0                 | <0.02 | 0.001  | 0                  | <0.02 | <0.02             | 0  | <0.02 | <0.001            | 0   |                   |  |     |                   |  |                   |  |     |
| Perfluoroundecanoic acid (PFUnDA)                         | µg/L | 0.001 | <0.02              | <0.02 | 0                 | <0.02 | <0.001 | 0                  | <0.02 | <0.02             | 0  | <0.02 | <0.001            | 0   |                   |  |     |                   |  |                   |  |     |
| Perfluorododecanoic acid (PFDoDA)                         | µg/L | 0.001 | <0.02              | <0.02 | 0                 | <0.02 | <0.001 | 0                  | <0.02 | <0.02             | 0  | <0.02 | <0.001            | 0   |                   |  |     |                   |  |                   |  |     |
| Perfluorotridecanoic acid (PFTrDA)                        | µg/L | 0.001 | <0.02              | <0.02 | 0                 | <0.02 | <0.001 | 0                  | <0.02 | <0.02             | 0  | <0.02 | <0.001            | 0   |                   |  |     |                   |  |                   |  |     |
| Perfluorotetradecanoic acid (PFTeDA)                      | µg/L | 0.001 | <0.05              | <0.05 | 0                 | <0.05 | <0.001 | 0                  | <0.05 | <0.05             | 0  | <0.05 | <0.001            | 0   |                   |  |     |                   |  |                   |  |     |
| PFAS - (n:2) Fluorotelomer Sulfonic Acids                 |      |       |                    |       |                   |       |        |                    |       |                   |    |       |                   |     |                   |  |     |                   |  |                   |  |     |
| 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | µg/L | 0.008 | <0.05              | <0.05 | 0                 | <0.05 | <0.008 | 0                  | <0.05 | <0.05             | 0  | <0.05 | <0.008            | 0   |                   |  |     |                   |  |                   |  |     |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | µg/L | 0.008 | <0.05              | <0.05 | 0                 | <0.05 | <0.008 | 0                  | <0.05 | <0.05             | 0  | <0.05 | <0.008            | 0   |                   |  |     |                   |  |                   |  |     |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | µg/L | 0.002 | <0.05              | <0.05 | 0                 | <0.05 | <0.002 | 0                  | <0.05 | <0.05             | 0  | <0.05 | <0.002            | 0   |                   |  |     |                   |  |                   |  |     |
| 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | µg/L | 0.004 | <0.05              | <0.05 | 0                 | <0.05 | <0.004 | 0                  | <0.05 | <0.05             | 0  | <0.05 | <0.004            | 0   |                   |  |     |                   |  |                   |  |     |
| PFAS - Perfluoroalkyl Sulfonamides                        |      |       |                    |       |                   |       |        |                    |       |                   |    |       |                   |     |                   |  |     |                   |  |                   |  |     |
| Perfluorooctane sulfonamide (FOSA)                        | µg/L | 0.004 | <0.02              | <0.02 | 0                 | <0.02 | <0.004 | 0                  | <0.02 | <0.02             | 0  | <0.02 | <0.004            | 0   |                   |  |     |                   |  |                   |  |     |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)             | µg/L | 0.004 | <0.05              | <0.05 | 0                 | <0.05 | <0.004 | 0                  | <0.05 | <0.05             | 0  | <0.05 | <0.004            | 0   |                   |  |     |                   |  |                   |  |     |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | µg/L | 0.004 | <0.02              | <0.02 | 0                 | <0.02 | <0.004 | 0                  | <0.02 | <0.02             | 0  | <0.02 | <0.004            | 0   |                   |  |     |                   |  |                   |  |     |
| N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | µg/L | 0.008 | <0.05              | <0.05 | 0                 | <0.05 | <0.008 | 0                  | <0.05 | <0.05             | 0  | <0.05 | <0.008            | 0   |                   |  |     |                   |  |                   |  |     |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | µg/L | 0.004 | <0.05              | <0.05 | 0                 | <0.05 | <0.004 | 0                  | <0.05 | <0.05             | 0  | <0.05 | <0.004            | 0   |                   |  |     |                   |  |                   |  |     |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | µg/L | 0.004 | <0.02              | <0.02 | 0                 | <0.02 | <0.004 | 0                  | <0.02 | <0.02             | 0  | <0.02 | <0.004            | 0   |                   |  |     |                   |  |                   |  |     |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | µg/L | 0.008 | <0.05              | <0.05 | 0                 | <0.05 | <0.008 | 0                  | <0.05 | <0.05             | 0  | <0.05 | <0.008            | 0   |                   |  |     |                   |  |                   |  |     |
| Perfluorooctane sulfonamidoacetic acid (FOSAA)            | µg/L | 0.002 |                    |       |                   |       | <0.002 |                    |       |                   |    |       | <0.002            |     |                   |  |     |                   |  |                   |  |     |
| PFAS                                                      |      |       |                    |       |                   |       |        |                    |       |                   |    |       |                   |     |                   |  |     |                   |  |                   |  |     |
| Sum of PFHxS and PFOS                                     | µg/L | 0.002 | 49.6               | 48.7  | 2                 | 49.6  | 3.7    | 172                | 0.96  | 0.91              | 5  | 0.96  | 0.14              | 149 |                   |  |     |                   |  |                   |  |     |
| Sum of PFAS                                               | µg/L | 0.001 | 83.3               | 80.9  | 3                 | 83.3  | 6.9    | 169                | 1.58  | 1.48              | 7  | 1.58  | 0.60              | 90  |                   |  |     |                   |  |                   |  |     |

| Field ID<br>Date<br>Matrix Type<br>Lab Report Number      |      |       | 0960_MW164_220622 | 0960_QC120_220622 | RPD | 0960_MW164_220622 | 0960_QC220_220622 | RPD | 0960_SW265_220622 | 0960_QC121_220622 | RPD | 0960_SW265_220622 | 0960_QC221_220622 | RPD |
|-----------------------------------------------------------|------|-------|-------------------|-------------------|-----|-------------------|-------------------|-----|-------------------|-------------------|-----|-------------------|-------------------|-----|
|                                                           |      |       | 22/06/2022        | 22/06/2022        |     | 22/06/2022        | 22/06/2022        |     | 22/06/2022        | 22/06/2022        |     | 22/06/2022        | 22/06/2022        |     |
|                                                           |      |       | Water             | Water             |     | Water             | Water             |     | Water             | Water             |     | Water             | Water             |     |
|                                                           |      |       | EP2207737         | EP2207737         |     | EP2207737         | 901145            |     | EP2207728         | EP2207728         |     | EP2207728         | 901145            |     |
|                                                           | Unit | LOR   |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| PFAS - Perfluoroalkyl Sulfonic Acids                      |      |       |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| Perfluorobutane sulfonic acid (PFBS)                      | µg/L | 0.002 | 0.37              | 0.38              | 3   | 0.37              | 0.054             | 149 | <0.02             | <0.02             | 0   | <0.02             | 0.002             | 0   |
| Perfluoropentane sulfonic acid (PFPeS)                    | µg/L | 0.002 | 0.48              | 0.48              | 0   | 0.48              | 0.048             | 164 | <0.02             | <0.02             | 0   | <0.02             | <0.002            | 0   |
| Perfluorohexane sulfonic acid (PFHxS)                     | µg/L | 0.002 | 2.74              | 2.79              | 2   | 2.74              | 0.29              | 162 | <0.01             | <0.01             | 0   | <0.01             | 0.008             | 0   |
| Perfluoroheptane sulfonic acid (PFHpS)                    | µg/L | 0.002 | 0.09              | 0.10              | 11  | 0.09              | 0.071             | 24  | <0.02             | <0.02             | 0   | <0.02             | <0.002            | 0   |
| Perfluorooctane sulfonic acid (PFOS)                      | µg/L | 0.004 | 0.94              | 1.01              | 7   | 0.94              | 0.061             | 176 | 0.09              | 0.09              | 0   | 0.09              | 0.044             | 69  |
| Perfluorodecane sulfonic acid (PFDS)                      | µg/L | 0.004 | <0.02             | <0.02             | 0   | <0.02             | <0.004            | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.004            | 0   |
| PFAS - Perfluoroalkyl Carboxylic Acids                    |      |       |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| Perfluorobutanoic acid (PFBA)                             | µg/L | 0.008 | 0.1               | 0.1               | 0   | 0.1               | 0.11              | 10  | <0.1              | <0.1              | 0   | <0.1              | <0.008            | 0   |
| Perfluoropentanoic acid (PFPeA)                           | µg/L | 0.002 | 0.25              | 0.26              | 4   | 0.25              | 0.041             | 144 | <0.02             | <0.02             | 0   | <0.02             | <0.002            | 0   |
| Perfluorohexanoic acid (PFHxA)                            | µg/L | 0.001 | 1.01              | 1.01              | 0   | 1.01              | 0.14              | 151 | <0.02             | <0.02             | 0   | <0.02             | 0.003             | 0   |
| Perfluoroheptanoic acid (PFHpA)                           | µg/L | 0.004 | 0.10              | 0.09              | 11  | 0.10              | 0.064             | 44  | <0.02             | <0.02             | 0   | <0.02             | 0.013             | 0   |
| Perfluorooctanoic acid (PFOA)                             | µg/L | 0.001 | 0.09              | 0.10              | 11  | 0.09              | 0.093             | 3   | <0.01             | <0.01             | 0   | <0.01             | 0.001             | 0   |
| Perfluorononanoic acid (PFNA)                             | µg/L | 0.002 | <0.02             | <0.02             | 0   | <0.02             | <0.002            | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.002            | 0   |
| Perfluorodecanoic acid (PFDA)                             | µg/L | 0.001 | <0.02             | <0.02             | 0   | <0.02             | <0.001            | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.001            | 0   |
| Perfluoroundecanoic acid (PFUnDA)                         | µg/L | 0.001 | <0.02             | <0.02             | 0   | <0.02             | <0.001            | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.001            | 0   |
| Perfluorododecanoic acid (PFDoDA)                         | µg/L | 0.001 | <0.02             | <0.02             | 0   | <0.02             | <0.001            | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.001            | 0   |
| Perfluorotridecanoic acid (PFTrDA)                        | µg/L | 0.001 | <0.02             | <0.02             | 0   | <0.02             | <0.001            | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.001            | 0   |
| Perfluorotetradecanoic acid (PFTeDA)                      | µg/L | 0.001 | <0.05             | <0.05             | 0   | <0.05             | <0.001            | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.001            | 0   |
| PFAS - (n:2) Fluorotelomer Sulfonic Acids                 |      |       |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | µg/L | 0.008 | <0.05             | <0.05             | 0   | <0.05             | <0.008            | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.008            | 0   |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | µg/L | 0.008 | <0.05             | <0.05             | 0   | <0.05             | 0.025             | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.008            | 0   |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | µg/L | 0.002 | <0.05             | <0.05             | 0   | <0.05             | <0.002            | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.002            | 0   |
| 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | µg/L | 0.004 | <0.05             | <0.05             | 0   | <0.05             | <0.004            | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.004            | 0   |
| PFAS - Perfluoroalkyl Sulfonamides                        |      |       |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| Perfluorooctane sulfonamide (FOSA)                        | µg/L | 0.004 | <0.02             | <0.02             | 0   | <0.02             | <0.004            | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.004            | 0   |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)             | µg/L | 0.004 | <0.05             | <0.05             | 0   | <0.05             | <0.004            | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.004            | 0   |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | µg/L | 0.004 | <0.02             | <0.02             | 0   | <0.02             | <0.004            | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.004            | 0   |
| N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | µg/L | 0.008 | <0.05             | <0.05             | 0   | <0.05             | <0.008            | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.008            | 0   |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | µg/L | 0.004 | <0.05             | <0.05             | 0   | <0.05             | <0.004            | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.004            | 0   |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | µg/L | 0.004 | <0.02             | <0.02             | 0   | <0.02             | <0.004            | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.004            | 0   |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | µg/L | 0.008 | <0.05             | <0.05             | 0   | <0.05             | <0.008            | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.008            | 0   |
| Perfluorooctane sulfonamidoacetic acid (FOSAA)            | µg/L | 0.002 |                   |                   |     |                   | <0.002            |     |                   |                   |     |                   | <0.002            |     |
| PFAS                                                      |      |       |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| Sum of PFHxS and PFOS                                     | µg/L | 0.002 | 3.68              | 3.80              | 3   | 3.68              | 0.35              | 165 | 0.09              | 0.09              | 0   | 0.09              | 0.053             | 52  |
| Sum of PFAS                                               | µg/L | 0.001 | 6.17              | 6.32              | 2   | 6.17              | 0.99              | 145 | 0.09              | 0.09              | 0   | 0.09              | 0.072             | 22  |

| Field ID<br>Date<br>Matrix Type<br>Lab Report Number      |      |       | 0960_MW122_220622 | 0960_QC124_220622 | RPD | 0960_MW122_220622 | 0960_QC224_220622 | RPD | 0960_SW189_220623 | 0960_QC126_220623 | RPD | 0960_SW189_220623 | 0960_QC226_220623 | RPD |
|-----------------------------------------------------------|------|-------|-------------------|-------------------|-----|-------------------|-------------------|-----|-------------------|-------------------|-----|-------------------|-------------------|-----|
|                                                           |      |       | 22/06/2022        | 22/06/2022        |     | 22/06/2022        | 22/06/2022        |     | 23/06/2022        | 23/06/2022        |     | 23/06/2022        | 23/06/2022        |     |
|                                                           |      |       | Water             | Water             |     | Water             | Water             |     | Water             | Water             |     | Water             | Water             |     |
|                                                           |      |       | EP2207731         | EP2207731         |     | EP2207731         | 901145            |     | EP2207812         | EP2207812         |     | EP2207812         | 901145            |     |
|                                                           | Unit | LOR   |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| PFAS - Perfluoroalkyl Sulfonic Acids                      |      |       |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| Perfluorobutane sulfonic acid (PFBS)                      | µg/L | 0.002 | <0.02             | <0.02             | 0   | <0.02             | <0.002            | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.002            | 0   |
| Perfluoropentane sulfonic acid (PFPeS)                    | µg/L | 0.002 | <0.02             | <0.02             | 0   | <0.02             | <0.002            | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.002            | 0   |
| Perfluorohexane sulfonic acid (PFHxS)                     | µg/L | 0.002 | <0.01             | <0.01             | 0   | <0.01             | <0.002            | 0   | <0.01             | <0.01             | 0   | <0.01             | 0.007             | 0   |
| Perfluoroheptane sulfonic acid (PFHpS)                    | µg/L | 0.002 | <0.02             | <0.02             | 0   | <0.02             | <0.002            | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.002            | 0   |
| Perfluorooctane sulfonic acid (PFOS)                      | µg/L | 0.004 | <0.01             | <0.01             | 0   | <0.01             | <0.004            | 0   | 0.14              | 0.14              | 0   | 0.14              | 0.059             | 81  |
| Perfluorodecane sulfonic acid (PFDS)                      | µg/L | 0.004 | <0.02             | <0.02             | 0   | <0.02             | <0.004            | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.004            | 0   |
| PFAS - Perfluoroalkyl Carboxylic Acids                    |      |       |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| Perfluorobutanoic acid (PFBA)                             | µg/L | 0.008 | <0.1              | <0.1              | 0   | <0.1              | <0.008            | 0   | <0.1              | <0.1              | 0   | <0.1              | <0.008            | 0   |
| Perfluoropentanoic acid (PFPeA)                           | µg/L | 0.002 | <0.02             | <0.02             | 0   | <0.02             | <0.002            | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.002            | 0   |
| Perfluorohexanoic acid (PFHxA)                            | µg/L | 0.001 | <0.02             | <0.02             | 0   | <0.02             | <0.001            | 0   | <0.02             | <0.02             | 0   | <0.02             | 0.003             | 0   |
| Perfluoroheptanoic acid (PFHpA)                           | µg/L | 0.004 | <0.02             | <0.02             | 0   | <0.02             | <0.004            | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.004            | 0   |
| Perfluorooctanoic acid (PFOA)                             | µg/L | 0.001 | <0.01             | <0.01             | 0   | <0.01             | <0.001            | 0   | <0.01             | <0.01             | 0   | <0.01             | 0.002             | 0   |
| Perfluorononanoic acid (PFNA)                             | µg/L | 0.002 | <0.02             | <0.02             | 0   | <0.02             | <0.002            | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.002            | 0   |
| Perfluorodecanoic acid (PFDA)                             | µg/L | 0.001 | <0.02             | <0.02             | 0   | <0.02             | <0.001            | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.001            | 0   |
| Perfluoroundecanoic acid (PFUnDA)                         | µg/L | 0.001 | <0.02             | <0.02             | 0   | <0.02             | <0.001            | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.001            | 0   |
| Perfluorododecanoic acid (PFDoDA)                         | µg/L | 0.001 | <0.02             | <0.02             | 0   | <0.02             | <0.001            | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.001            | 0   |
| Perfluorotridecanoic acid (PFTrDA)                        | µg/L | 0.001 | <0.02             | <0.02             | 0   | <0.02             | <0.001            | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.001            | 0   |
| Perfluorotetradecanoic acid (PFTeDA)                      | µg/L | 0.001 | <0.05             | <0.05             | 0   | <0.05             | <0.001            | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.001            | 0   |
| PFAS - (n:2) Fluorotelomer Sulfonic Acids                 |      |       |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | µg/L | 0.008 | <0.05             | <0.05             | 0   | <0.05             | <0.008            | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.008            | 0   |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | µg/L | 0.008 | <0.05             | <0.05             | 0   | <0.05             | <0.008            | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.008            | 0   |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | µg/L | 0.002 | <0.05             | <0.05             | 0   | <0.05             | <0.002            | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.002            | 0   |
| 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | µg/L | 0.004 | <0.05             | <0.05             | 0   | <0.05             | <0.004            | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.004            | 0   |
| PFAS - Perfluoroalkyl Sulfonamides                        |      |       |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| Perfluorooctane sulfonamide (FOSA)                        | µg/L | 0.004 | <0.02             | <0.02             | 0   | <0.02             | <0.004            | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.004            | 0   |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)             | µg/L | 0.004 | <0.05             | <0.05             | 0   | <0.05             | <0.004            | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.004            | 0   |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | µg/L | 0.004 | <0.02             | <0.02             | 0   | <0.02             | <0.004            | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.004            | 0   |
| N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | µg/L | 0.008 | <0.05             | <0.05             | 0   | <0.05             | <0.008            | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.008            | 0   |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | µg/L | 0.004 | <0.05             | <0.05             | 0   | <0.05             | <0.004            | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.004            | 0   |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | µg/L | 0.004 | <0.02             | <0.02             | 0   | <0.02             | <0.004            | 0   | <0.02             | <0.02             | 0   | <0.02             | <0.004            | 0   |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | µg/L | 0.008 | <0.05             | <0.05             | 0   | <0.05             | <0.008            | 0   | <0.05             | <0.05             | 0   | <0.05             | <0.008            | 0   |
| Perfluorooctane sulfonamidoacetic acid (FOSAA)            | µg/L | 0.002 |                   |                   |     |                   | <0.002            |     |                   |                   |     |                   | <0.002            |     |
| PFAS                                                      |      |       |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| Sum of PFHxS and PFOS                                     | µg/L | 0.002 | <0.01             | <0.01             | 0   | <0.01             | <0.002            | 0   | 0.14              | 0.14              | 0   | 0.14              | 0.066             | 72  |
| Sum of PFAS                                               | µg/L | 0.001 | <0.01             | <0.01             | 0   | <0.01             | <0.001            | 0   | 0.14              | 0.14              | 0   | 0.14              | 0.071             | 65  |

| Field ID<br>Date<br>Matrix Type<br>Lab Report Number      |       |        | 0960_SD123_220622 | 0960_QC118_220622 | RPD | 0960_SD123_220622 | 0960_QC218_220622 | RPD | 0960_SS293_220622 | 0960_QC122_220622 | RPD | 0960_SS293_220622 | 0960_QC222_220622 | RPD |
|-----------------------------------------------------------|-------|--------|-------------------|-------------------|-----|-------------------|-------------------|-----|-------------------|-------------------|-----|-------------------|-------------------|-----|
|                                                           |       |        | 22/06/2022        | 22/06/2022        |     | 22/06/2022        | 22/06/2022        |     | 22/06/2022        | 22/06/2022        |     |                   |                   |     |
|                                                           |       |        | Soil              | Soil              |     | Soil              | Soil              |     | Soil              | Soil              |     |                   |                   |     |
|                                                           |       |        | EP2207733         | EP2207733         |     | EP2207733         | 901145            |     | EP2207733         | EP2207733         |     | EP2207733         | 901145            |     |
|                                                           | Unit  | LOR    |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| PFAS - Perfluoroalkyl Sulfonic Acids                      |       |        |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| Perfluorobutane sulfonic acid (PFBS)                      | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   |
| Perfluoropentane sulfonic acid (PFPeS)                    | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   |
| Perfluorohexane sulfonic acid (PFHxS)                     | mg/kg | 0.0002 | 0.0003            | <0.0002           | 40  | 0.0003            | <0.0004           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   |
| Perfluoroheptane sulfonic acid (PFHpS)                    | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   |
| Perfluorooctane sulfonic acid (PFOS)                      | mg/kg | 0.0002 | 0.0384            | 0.0313            | 20  | 0.0384            | 0.029             | 28  | 0.0035            | 0.0022            | 46  | 0.0035            | 0.0027            | 26  |
| Perfluorodecane sulfonic acid (PFDS)                      | mg/kg | 0.0002 | 0.0016            | 0.0013            | 21  | 0.0016            | <0.0004           | 120 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   |
| PFAS - Perfluoroalkyl Carboxylic Acids                    |       |        |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| Perfluorobutanoic acid (PFBA)                             | mg/kg | 0.0008 | <0.001            | <0.001            | 0   | <0.001            | <0.0008           | 0   | <0.001            | <0.001            | 0   | <0.001            | <0.0008           | 0   |
| Perfluoropentanoic acid (PFPeA)                           | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   |
| Perfluorohexanoic acid (PFHxA)                            | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   |
| Perfluoroheptanoic acid (PFHpA)                           | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0008           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0008           | 0   |
| Perfluorooctanoic acid (PFOA)                             | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   |
| Perfluorononanoic acid (PFNA)                             | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   |
| Perfluorodecanoic acid (PFDA)                             | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   |
| Perfluoroundecanoic acid (PFUnDA)                         | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   |
| Perfluorododecanoic acid (PFDoDA)                         | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   |
| Perfluorotridecanoic acid (PFTrDA)                        | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   |
| Perfluorotetradecanoic acid (PFTeDA)                      | mg/kg | 0.0002 | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0002           | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0002           | 0   |
| PFAS - (n:2) Fluorotelomer Sulfonic Acids                 |       |        |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | mg/kg | 0.0005 | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0005           | 0   |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | mg/kg | 0.0005 | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0005           | 0   |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | mg/kg | 0.0005 | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0005           | 0   |
| 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | mg/kg | 0.0005 | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0005           | 0   |
| PFAS - Perfluoroalkyl Sulfonamides                        |       |        |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| Perfluorooctane sulfonamide (FOSA)                        | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)             | mg/kg | 0.0004 | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0004           | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0004           | 0   |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   |
| N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | mg/kg | 0.0005 | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0008           | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0008           | 0   |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | mg/kg | 0.0004 | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0004           | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0004           | 0   |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | mg/kg | 0.0005 | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0008           | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0008           | 0   |
| Perfluorooctane sulfonamidoacetic acid (FOSAA)            | mg/kg | 0.0004 |                   |                   |     |                   | <0.0004           |     |                   |                   |     |                   | <0.0004           |     |
| PFAS                                                      |       |        |                   |                   |     |                   |                   |     |                   |                   |     |                   |                   |     |
| Sum of PFHxS and PFOS                                     | mg/kg | 0.0002 | 0.0387            | 0.0313            | 21  | 0.0387            | 0.029             | 29  | 0.0035            | 0.0022            | 46  | 0.0035            | 0.0027            | 26  |
| Sum of PFAS                                               | mg/kg | 0.0002 | 0.0403            | 0.0326            | 21  | 0.0403            | 0.029             | 33  | 0.0035            | 0.0022            | 46  | 0.0035            | 0.0027            | 26  |

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



| Field ID<br>Date<br>Matrix Type<br>Lab Report Number      |       |        | 0960_SS227_220622 | 0960_QC123_220622 | RPD | 0960_SS227_220622 | 0960_QC223_220622 | RPD | 0960_SS278_220622 | 0960_QC125_220622 | RPD |
|-----------------------------------------------------------|-------|--------|-------------------|-------------------|-----|-------------------|-------------------|-----|-------------------|-------------------|-----|
|                                                           |       |        | 22/06/2022        | 22/06/2022        |     | 22/06/2022        | 22/06/2022        |     | 22/06/2022        | 22/06/2022        |     |
|                                                           |       |        | Soil              | Soil              |     | Soil              | Soil              |     | Soil              | Soil              |     |
|                                                           |       |        | EP2207733         | EP2207733         |     | EP2207733         | 901145            |     | EP2207729         | EP2207729         |     |
|                                                           | Unit  | LOR    |                   |                   |     |                   |                   |     |                   |                   |     |
| PFAS - Perfluoroalkyl Sulfonic Acids                      |       |        |                   |                   |     |                   |                   |     |                   |                   |     |
| Perfluorobutane sulfonic acid (PFBS)                      | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   | <0.0002           | <0.0002           | 0   |
| Perfluoropentane sulfonic acid (PFPeS)                    | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   | <0.0002           | <0.0002           | 0   |
| Perfluorohexane sulfonic acid (PFHxS)                     | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | 0.0013            | 147 | <0.0002           | <0.0002           | 0   |
| Perfluoroheptane sulfonic acid (PFHpS)                    | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   | <0.0002           | <0.0002           | 0   |
| Perfluorooctane sulfonic acid (PFOS)                      | mg/kg | 0.0002 | 0.0041            | 0.0081            | 66  | 0.0041            | 0.0099            | 83  | 0.0003            | 0.0003            | 0   |
| Perfluorodecane sulfonic acid (PFDS)                      | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   | <0.0002           | <0.0002           | 0   |
| PFAS - Perfluoroalkyl Carboxylic Acids                    |       |        |                   |                   |     |                   |                   |     |                   |                   |     |
| Perfluorobutanoic acid (PFBA)                             | mg/kg | 0.0008 | <0.001            | <0.001            | 0   | <0.001            | <0.0008           | 0   | <0.001            | <0.001            | 0   |
| Perfluoropentanoic acid (PFPeA)                           | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   |
| Perfluorohexanoic acid (PFHxA)                            | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   | <0.0002           | <0.0002           | 0   |
| Perfluoroheptanoic acid (PFHpA)                           | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0008           | 0   | <0.0002           | <0.0002           | 0   |
| Perfluorooctanoic acid (PFOA)                             | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   |
| Perfluorononanoic acid (PFNA)                             | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   |
| Perfluorodecanoic acid (PFDA)                             | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   |
| Perfluoroundecanoic acid (PFUnDA)                         | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   |
| Perfluorododecanoic acid (PFDoDA)                         | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   |
| Perfluorotridecanoic acid (PFTrDA)                        | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   |
| Perfluorotetradecanoic acid (PFTeDA)                      | mg/kg | 0.0002 | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0002           | 0   | <0.0005           | <0.0005           | 0   |
| PFAS - (n:2) Fluorotelomer Sulfonic Acids                 |       |        |                   |                   |     |                   |                   |     |                   |                   |     |
| 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | mg/kg | 0.0005 | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0005           | 0   |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | mg/kg | 0.0005 | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0005           | 0   |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | mg/kg | 0.0005 | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0005           | 0   |
| 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | mg/kg | 0.0005 | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0005           | 0   |
| PFAS - Perfluoroalkyl Sulfonamides                        |       |        |                   |                   |     |                   |                   |     |                   |                   |     |
| Perfluorooctane sulfonamide (FOSA)                        | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   | <0.0002           | <0.0002           | 0   |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)             | mg/kg | 0.0004 | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0004           | 0   | <0.0005           | <0.0005           | 0   |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   | <0.0002           | <0.0002           | 0   |
| N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | mg/kg | 0.0005 | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0008           | 0   | <0.0005           | <0.0005           | 0   |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | mg/kg | 0.0004 | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0004           | 0   | <0.0005           | <0.0005           | 0   |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   | <0.0002           | <0.0002           | 0   |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | mg/kg | 0.0005 | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0008           | 0   | <0.0005           | <0.0005           | 0   |
| Perfluorooctane sulfonamidoacetic acid (FOSAA)            | mg/kg | 0.0004 |                   |                   |     |                   | <0.0004           |     |                   |                   |     |
| PFAS                                                      |       |        |                   |                   |     |                   |                   |     |                   |                   |     |
| Sum of PFHxS and PFOS                                     | mg/kg | 0.0002 | 0.0041            | 0.0081            | 66  | 0.0041            | 0.011             | 91  | 0.0003            | 0.0003            | 0   |
| Sum of PFAS                                               | mg/kg | 0.0002 | 0.0041            | 0.0081            | 66  | 0.0041            | 0.011             | 91  | 0.0003            | 0.0003            | 0   |

| Field ID<br>Date<br>Matrix Type<br>Lab Report Number      |       |        | 0960_SS278_220622 | 0960_QC225_220622 | RPD | 0960_SD208_220623 | 0960_QC127_220623 | RPD | 0960_SD208_220623 | 0960_QC227_220623 | RPD |
|-----------------------------------------------------------|-------|--------|-------------------|-------------------|-----|-------------------|-------------------|-----|-------------------|-------------------|-----|
|                                                           |       |        | 22/06/2022        | 22/06/2022        |     | 23/06/2022        | 23/06/2022        |     | 23/06/2022        | 23/06/2022        |     |
|                                                           |       |        | Soil              | Soil              |     | Soil              | Soil              |     | Soil              | Soil              |     |
|                                                           |       |        | EP2207729         | 901145            |     | EP2207813         | EP2207813         |     | EP2207813         | 901145            |     |
|                                                           | Unit  | LOR    |                   |                   |     |                   |                   |     |                   |                   |     |
| PFAS - Perfluoroalkyl Sulfonic Acids                      |       |        |                   |                   |     |                   |                   |     |                   |                   |     |
| Perfluorobutane sulfonic acid (PFBS)                      | mg/kg | 0.0002 | <0.0002           | <0.0004           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   |
| Perfluoropentane sulfonic acid (PFPeS)                    | mg/kg | 0.0002 | <0.0002           | <0.0004           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   |
| Perfluorohexane sulfonic acid (PFHxS)                     | mg/kg | 0.0002 | <0.0002           | <0.0004           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   |
| Perfluoroheptane sulfonic acid (PFHpS)                    | mg/kg | 0.0002 | <0.0002           | <0.0004           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   |
| Perfluorooctane sulfonic acid (PFOS)                      | mg/kg | 0.0002 | 0.0003            | <0.0004           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   |
| Perfluorodecane sulfonic acid (PFDS)                      | mg/kg | 0.0002 | <0.0002           | <0.0004           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   |
| PFAS - Perfluoroalkyl Carboxylic Acids                    |       |        |                   |                   |     |                   |                   |     |                   |                   |     |
| Perfluorobutanoic acid (PFBA)                             | mg/kg | 0.0008 | <0.001            | <0.0008           | 0   | <0.001            | <0.001            | 0   | <0.001            | <0.0008           | 0   |
| Perfluoropentanoic acid (PFPeA)                           | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   |
| Perfluorohexanoic acid (PFHxA)                            | mg/kg | 0.0002 | <0.0002           | <0.0004           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   |
| Perfluoroheptanoic acid (PFHpA)                           | mg/kg | 0.0002 | <0.0002           | <0.0008           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0008           | 0   |
| Perfluorooctanoic acid (PFOA)                             | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   |
| Perfluorononanoic acid (PFNA)                             | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   |
| Perfluorodecanoic acid (PFDA)                             | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   |
| Perfluoroundecanoic acid (PFUnDA)                         | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   |
| Perfluorododecanoic acid (PFDoDA)                         | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   |
| Perfluorotridecanoic acid (PFTrDA)                        | mg/kg | 0.0002 | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   |
| Perfluorotetradecanoic acid (PFTeDA)                      | mg/kg | 0.0002 | <0.0005           | <0.0002           | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0002           | 0   |
| PFAS - (n:2) Fluorotelomer Sulfonic Acids                 |       |        |                   |                   |     |                   |                   |     |                   |                   |     |
| 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | mg/kg | 0.0005 | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0005           | 0   |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | mg/kg | 0.0005 | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0005           | 0   |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | mg/kg | 0.0005 | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0005           | 0   |
| 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | mg/kg | 0.0005 | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0005           | 0   |
| PFAS - Perfluoroalkyl Sulfonamides                        |       |        |                   |                   |     |                   |                   |     |                   |                   |     |
| Perfluorooctane sulfonamide (FOSA)                        | mg/kg | 0.0002 | <0.0002           | <0.0004           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)             | mg/kg | 0.0004 | <0.0005           | <0.0004           | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0004           | 0   |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | mg/kg | 0.0002 | <0.0002           | <0.0004           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   |
| N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | mg/kg | 0.0005 | <0.0005           | <0.0008           | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0008           | 0   |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | mg/kg | 0.0004 | <0.0005           | <0.0004           | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0004           | 0   |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | mg/kg | 0.0002 | <0.0002           | <0.0004           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | mg/kg | 0.0005 | <0.0005           | <0.0008           | 0   | <0.0005           | <0.0005           | 0   | <0.0005           | <0.0008           | 0   |
| Perfluorooctane sulfonamidoacetic acid (FOSAA)            | mg/kg | 0.0004 |                   | <0.0004           |     |                   |                   |     |                   | <0.0004           |     |
| PFAS                                                      |       |        |                   |                   |     |                   |                   |     |                   |                   |     |
| Sum of PFHxS and PFOS                                     | mg/kg | 0.0002 | 0.0003            | <0.0004           | 0   | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0004           | 0   |
| Sum of PFAS                                               | mg/kg | 0.0002 | 0.0003            | <0.0002           | 40  | <0.0002           | <0.0002           | 0   | <0.0002           | <0.0002           | 0   |

APPENDIX

C

LABORATORY CERTIFICATES



now





# CHAIN OF CUSTODY

COC#: 39222

ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: Learmonth GW - MB

ORDER NO: pfas-omp Learmonth

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:

## SAMPLE DETAILS

## ANALYSIS REQUIRED

| SAMPLE | NAME          | DESCRIPTION | DATE / TIME         | MATRIX | TOTAL BOTTLES        | ON HOLD | Ground Waters WATER | Rinse WATER | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION        |
|--------|---------------|-------------|---------------------|--------|----------------------|---------|---------------------|-------------|----------------------|-------------------------------|
| 001    | 0960_MW151 ✓  |             | 22/06/2022 08:45 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |             |                      |                               |
| 002    | 0960_MW238 ✓  |             | 22/06/2022 09:03 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |             |                      |                               |
| 003    | 0960_MW148S ✓ |             | 22/06/2022 09:43 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |             |                      |                               |
| 004    | 0960_QC116 ✓  |             | 22/06/2022 09:44 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |             |                      |                               |
| 005    | 0960_MW148D ✓ |             | 22/06/2022 09:45 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |             |                      |                               |
| 006    | 0960_MW105 ✓  |             | 22/06/2022 10:42 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |             |                      |                               |
| 007    | 0960_QC119 ✓  |             | 22/06/2022 10:43 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |             |                      |                               |
| 008    | 0960_MW104 ✓  |             | 22/06/2022 11:14 AM | Water  | ALS: 5<br>Non ALS: 0 | No      | Partial 4/8         |             |                      |                               |
| 009    | 0960_MW102 ✓  |             | 22/06/2022 12:00 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |             |                      | extra PFAS bottles for lab QC |



# CHAIN OF CUSTODY

COC#: 39222

ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: Learmonth GW - MB

ORDER NO: pfas-omp Learmonth

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:

/ ES2022MWHAUS0002

## SAMPLE DETAILS

## ANALYSIS REQUIRED

| SAMPLE | NAME       | DESCRIPTION | DATE / TIME         | MATRIX | TOTAL BOTTLES        | ON HOLD | Ground Waters WATER | Rinsate WATER | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION        |
|--------|------------|-------------|---------------------|--------|----------------------|---------|---------------------|---------------|----------------------|-------------------------------|
| 010    | 0960_MW159 |             | 22/06/2022 03:35 PM | Water  | ALS: 5<br>Non ALS: 0 | No      | Partial 4/8         |               |                      |                               |
| 011    | 0960_MW170 |             | 22/06/2022 03:40 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |               |                      | extra PFAS bottles for lab QC |
| 012    | 0960_MW172 |             | 22/06/2022 03:41 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |               |                      |                               |
| 013    | 0960_MW124 |             | 22/06/2022 04:12 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |               |                      |                               |
| 014    | 0960_QC301 |             | 22/06/2022 05:37 PM | Water  | ALS: 2<br>Non ALS: 0 | No      |                     | X             |                      |                               |
| 015    | 0960_QC302 |             | 22/06/2022 05:37 PM | Water  | ALS: 2<br>Non ALS: 0 | No      |                     | X             |                      |                               |
| 016    | 0960_QC303 |             | 22/06/2022 05:38 PM | Water  | ALS: 2<br>Non ALS: 0 | No      |                     | X             |                      |                               |
| 017    | 0960_QC401 |             | 22/06/2022 05:39 PM | Water  | ALS: 2<br>Non ALS: 0 | No      |                     | X             |                      |                               |
| 018    | 0960_QC402 |             | 22/06/2022 05:39 PM | Water  | ALS: 2<br>Non ALS: 0 | No      |                     | X             |                      |                               |



# CHAIN OF CUSTODY

COC#: 39222

ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: Learmonth GW - MB

ORDER NO: pfas-omp Learmonth

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:

## SAMPLE DETAILS

## ANALYSIS REQUIRED

| SAMPLE | NAME       | DESCRIPTION | DATE / TIME            | MATRIX | TOTAL BOTTLES        | ON HOLD | Ground Waters WATER | Rinsate WATER | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|------------|-------------|------------------------|--------|----------------------|---------|---------------------|---------------|----------------------|------------------------|
| 019    | 0960_QC403 |             | 22/06/2022<br>05:40 PM | Water  | ALS: 2<br>Non ALS: 0 | No      |                     | X             |                      |                        |





# CHAIN OF CUSTODY

COC#: 39222

ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: Learmonth GW - MB

ORDER NO: pfas-omp Learmonth

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:

B

/ ES2022MWHAUS0002

## LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes 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    | 0960_MW151  | Ground Waters WATER         | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 002    | 0960_MW238  | Ground Waters WATER         | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 003    | 0960_MW148S | Ground Waters WATER         | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 004    | 0960_QC116  | Ground Waters WATER         | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 005    | 0960_MW148D | Ground Waters WATER         | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 006    | 0960_MW105  | Ground Waters WATER         | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 007    | 0960_QC119  | Ground Waters WATER         | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 008    | 0960_MW104  | Ground Waters WATER         | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 009    | 0960_MW102  | Ground Waters WATER         | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |



# CHAIN OF CUSTODY

COC#: 39222

ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: Learmonth GW - MB

ORDER NO: pfas-omp Learmonth

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:

|     |            |                     |       |                                                                                                                                                                                                                                                                                     |
|-----|------------|---------------------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 010 | 0960_MW159 | Ground Waters WATER | Water | <ul style="list-style-type: none"> <li>- NT-02 Major Anions (Chloride, Sulphate, Alkalinity)</li> <li>- NT-01 Major Cations (Ca, Mg, Na, K)</li> <li>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &amp; ED093F</li> <li>- EP231X PFAS - Full Suite (28 analytes)</li> </ul> |
| 011 | 0960_MW170 | Ground Waters WATER | Water | <ul style="list-style-type: none"> <li>- NT-02 Major Anions (Chloride, Sulphate, Alkalinity)</li> <li>- NT-01 Major Cations (Ca, Mg, Na, K)</li> <li>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &amp; ED093F</li> <li>- EP231X PFAS - Full Suite (28 analytes)</li> </ul> |
| 012 | 0960_MW172 | Ground Waters WATER | Water | <ul style="list-style-type: none"> <li>- NT-02 Major Anions (Chloride, Sulphate, Alkalinity)</li> <li>- NT-01 Major Cations (Ca, Mg, Na, K)</li> <li>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &amp; ED093F</li> <li>- EP231X PFAS - Full Suite (28 analytes)</li> </ul> |
| 013 | 0960_MW124 | Ground Waters WATER | Water | <ul style="list-style-type: none"> <li>- NT-02 Major Anions (Chloride, Sulphate, Alkalinity)</li> <li>- NT-01 Major Cations (Ca, Mg, Na, K)</li> <li>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &amp; ED093F</li> <li>- EP231X PFAS - Full Suite (28 analytes)</li> </ul> |



# CHAIN OF CUSTODY

COC#: 39222

ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: Learmonth GW - MB

ORDER NO: pfas-omp Learmonth

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:

| SAMPLE | SAMPLE NAME | BOTTLE NAME                    | VOLUME | BARCODE        | TYPE  | FILTERED | REASON |
|--------|-------------|--------------------------------|--------|----------------|-------|----------|--------|
| 001    | 0960_MW151  | Clear Plastic Bottle - Natural | 500 mL | 00070621089735 | Green | No       |        |
| 001    | 0960_MW151  | HDPE (no PTFE)                 | 20 mL  | 00350821023859 | Grey  | No       |        |
| 001    | 0960_MW151  | HDPE (no PTFE)                 | 20 mL  | 00350821023985 | Grey  | No       |        |
| 002    | 0960_MW238  | HDPE (no PTFE)                 | 20 mL  | 00350821023934 | Grey  | No       |        |
| 002    | 0960_MW238  | HDPE (no PTFE)                 | 20 mL  | 00350821023979 | Grey  | No       |        |
| 002    | 0960_MW238  | Clear Plastic Bottle - Natural | 500 mL | 00070621089956 | Green | No       |        |
| 003    | 0960_MW148S | HDPE (no PTFE)                 | 20 mL  | 00352101070753 | Grey  | No       |        |
| 003    | 0960_MW148S | HDPE (no PTFE)                 | 20 mL  | 00352101070939 | Grey  | No       |        |
| 003    | 0960_MW148S | Clear Plastic Bottle - Natural | 500 mL | 00070621089918 | Green | No       |        |
| 004    | 0960_QC116  | HDPE (no PTFE)                 | 20 mL  | 00350821023900 | Grey  | No       |        |
| 004    | 0960_QC116  | HDPE (no PTFE)                 | 20 mL  | 00350821023850 | Grey  | No       |        |
| 004    | 0960_QC116  | Clear Plastic Bottle - Natural | 500 mL | 00070621089856 | Green | No       |        |
| 005    | 0960_MW148D | Clear Plastic Bottle - Natural | 500 mL | 00070621172441 | Green | No       |        |
| 005    | 0960_MW148D | HDPE (no PTFE)                 | 20 mL  | 00352101057962 | Grey  | No       |        |
| 005    | 0960_MW148D | HDPE (no PTFE)                 | 20 mL  | 00352101058359 | Grey  | No       |        |
| 006    | 0960_MW105  | Clear Plastic Bottle - Natural | 500 mL | 00070621089848 | Green | No       |        |
| 006    | 0960_MW105  | HDPE (no PTFE)                 | 20 mL  | 00350821023971 | Grey  | No       |        |
| 006    | 0960_MW105  | HDPE (no PTFE)                 | 20 mL  | 00350821023746 | Grey  | No       |        |
| 007    | 0960_QC119  | Clear Plastic Bottle - Natural | 500 mL | 00070621089948 | Green | No       |        |
| 007    | 0960_QC119  | HDPE (no PTFE)                 | 20 mL  | 00350821023975 | Grey  | No       |        |
| 007    | 0960_QC119  | HDPE (no PTFE)                 | 20 mL  | 00350821023837 | Grey  | No       |        |
| 008    | 0960_MW104  | Clear Plastic Bottle - Natural | 500 mL | 00070621172064 | Green | No       |        |
| 008    | 0960_MW104  | HDPE (no PTFE)                 | 20 mL  | 00352101058237 | Grey  | No       |        |
| 008    | 0960_MW104  | HDPE (no PTFE)                 | 20 mL  | 00352005019404 | Grey  | No       |        |
| 008    | 0960_MW104  | HDPE (no PTFE)                 | 20 mL  | 00352101058308 | Grey  | No       |        |
| 008    | 0960_MW104  | HDPE (no PTFE)                 | 20 mL  | 00352005019745 | Grey  | No       |        |



# CHAIN OF CUSTODY

COC#: 39222

ALS Laboratory: EP Perth

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: MWAHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFSASOMP

SITE: Learmonth GW - MB

ORDER NO: pfas-omp Learmonth

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:

|     |            |                                |        |                |       |    |  |
|-----|------------|--------------------------------|--------|----------------|-------|----|--|
| 009 | 0960_MW102 | Clear Plastic Bottle - Natural | 500 mL | 00070621089852 | Green | No |  |
| 009 | 0960_MW102 | HDPE (no PTFE)                 | 20 mL  | 00350821023787 | Grey  | No |  |
| 009 | 0960_MW102 | HDPE (no PTFE)                 | 20 mL  | 00350821023885 | Grey  | No |  |
| 010 | 0960_MW159 | Clear Plastic Bottle - Natural | 500 mL | 00070621191247 | Green | No |  |
| 010 | 0960_MW159 | HDPE (no PTFE)                 | 20 mL  | 00352005019792 | Grey  | No |  |
| 010 | 0960_MW159 | HDPE (no PTFE)                 | 20 mL  | 00352101071479 | Grey  | No |  |
| 010 | 0960_MW159 | HDPE (no PTFE)                 | 20 mL  | 00352005019493 | Grey  | No |  |
| 010 | 0960_MW159 | HDPE (no PTFE)                 | 20 mL  | 00352101071987 | Grey  | No |  |
| 011 | 0960_MW170 | HDPE (no PTFE)                 | 20 mL  | 00352101071778 | Grey  | No |  |
| 011 | 0960_MW170 | Clear Plastic Bottle - Natural | 500 mL | 00070621070543 | Green | No |  |
| 011 | 0960_MW170 | HDPE (no PTFE)                 | 20 mL  | 00352101071610 | Grey  | No |  |
| 012 | 0960_MW172 | Clear Plastic Bottle - Natural | 500 mL | 00070621089912 | Green | No |  |
| 012 | 0960_MW172 | HDPE (no PTFE)                 | 20 mL  | 00350821023903 | Grey  | No |  |
| 012 | 0960_MW172 | HDPE (no PTFE)                 | 20 mL  | 00350821023989 | Grey  | No |  |
| 013 | 0960_MW124 | Clear Plastic Bottle - Natural | 500 mL | 00070621089624 | Green | No |  |
| 013 | 0960_MW124 | HDPE (no PTFE)                 | 20 mL  | 00350821023750 | Grey  | No |  |
| 013 | 0960_MW124 | HDPE (no PTFE)                 | 20 mL  | 00350821023993 | Grey  | No |  |
| 014 | 0960_QC301 | HDPE (no PTFE)                 | 20 mL  | 00350019177587 | Grey  | No |  |
| 014 | 0960_QC301 | HDPE (no PTFE)                 | 20 mL  | 00350019177366 | Grey  | No |  |
| 015 | 0960_QC302 | HDPE (no PTFE)                 | 20 mL  | 00350019177593 | Grey  | No |  |
| 015 | 0960_QC302 | HDPE (no PTFE)                 | 20 mL  | 00350019042160 | Grey  | No |  |
| 016 | 0960_QC303 | HDPE (no PTFE)                 | 20 mL  | 00350019177317 | Grey  | No |  |
| 016 | 0960_QC303 | HDPE (no PTFE)                 | 20 mL  | 00350019112548 | Grey  | No |  |
| 017 | 0960_QC401 | HDPE (no PTFE)                 | 20 mL  | 00350019177424 | Grey  | No |  |
| 017 | 0960_QC401 | HDPE (no PTFE)                 | 20 mL  | 00350019165772 | Grey  | No |  |
| 018 | 0960_QC402 | HDPE (no PTFE)                 | 20 mL  | 00350019177335 | Grey  | No |  |
| 018 | 0960_QC402 | HDPE (no PTFE)                 | 20 mL  | 00350019042132 | Grey  | No |  |



# CHAIN OF CUSTODY

ALS COC#: 39222

ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: Learmonth GW - MB

ORDER NO: pfas-omp Learmonth

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:

019

0960\_QC403

HDPE (no PTFE)

20 mL

00350019177508

Grey

No

019

0960\_QC403

HDPE (no PTFE)

20 mL

00350019177460

Grey

No

Total Bottle Count: ALS: 55, Non ALS: 0

**SAMPLE RECEIPT NOTIFICATION (SRN)****Work Order : EP2207727**

|              |                                                   |              |                                                             |
|--------------|---------------------------------------------------|--------------|-------------------------------------------------------------|
| Client       | : STANTEC AUSTRALIA PTY LTD                       | Laboratory   | : Environmental Division Perth                              |
| Contact      | : [REDACTED]                                      | Contact      | : [REDACTED]                                                |
| Address      | : GROUND FLOOR 226 ADELAIDE TERRACE<br>PERTH 6000 | Address      | : 26 Rigali Way Wangara Western<br>Australia Australia 6065 |
| E-mail       | : [REDACTED]@stantec.com                          | E-mail       | : [REDACTED]@alsglobal.com                                  |
| Telephone    | : ----                                            | Telephone    | : +6138549 9609                                             |
| Facsimile    | : ----                                            | Facsimile    | : +61-8-9406 1399                                           |
| Project      | : WA_0960_PFASOMP                                 | Page         | : 1 of 2                                                    |
| Order number | : pfas-omp Learmonth                              | Quote number | : ES2022MWHAUS0002 (SY/139/19 B)                            |
| C-O-C number | : 39222                                           | QC Level     | : NEPM 2013 B3 & ALS QC Standard                            |
| Site         | : Learmonth GW - MB                               |              |                                                             |
| Sampler      | : [REDACTED]                                      |              |                                                             |

**Dates**

|                           |                     |                          |                      |
|---------------------------|---------------------|--------------------------|----------------------|
| Date Samples Received     | : 27-Jun-2022 11:40 | Issue Date               | : 28-Jun-2022        |
| Client Requested Due Date | : 08-Jul-2022       | Scheduled Reporting Date | : <b>08-Jul-2022</b> |

**Delivery Details**

|                      |           |                                    |                      |
|----------------------|-----------|------------------------------------|----------------------|
| Mode of Delivery     | : Carrier | Security Seal                      | : Not Available      |
| No. of coolers/boxes | : 5       | Temperature                        | : 13.4 - Ice present |
| Receipt Detail       | :         | No. of samples received / analysed | : 19 / 19            |

**General Comments**

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



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

- ### Summary of Sample(s) and Requested Analysis

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

| Laboratory sample ID | Sampling date / time | Sample ID          | WATER<br>Ionic Ba | WATER<br>PFAS - | WATER<br>Major C | WATER<br>Major A |
|----------------------|----------------------|--------------------|-------------------|-----------------|------------------|------------------|
| EP2207727-001        | 22-Jun-2022 08:45    | 0960_MW151_220622  | ✓                 | ✓               | ✓                | ✓                |
| EP2207727-002        | 22-Jun-2022 09:03    | 0960_MW238_220622  | ✓                 | ✓               | ✓                | ✓                |
| EP2207727-003        | 22-Jun-2022 09:43    | 0960_MW148S_220622 | ✓                 | ✓               | ✓                | ✓                |
| EP2207727-004        | 22-Jun-2022 09:44    | 0960_QC116_220622  | ✓                 | ✓               | ✓                | ✓                |
| EP2207727-005        | 22-Jun-2022 09:45    | 0960_MW148D_220622 | ✓                 | ✓               | ✓                | ✓                |
| EP2207727-006        | 22-Jun-2022 10:42    | 0960_MW105_220622  | ✓                 | ✓               | ✓                | ✓                |
| EP2207727-007        | 22-Jun-2022 10:43    | 0960_QC119_220622  | ✓                 | ✓               | ✓                | ✓                |
| EP2207727-008        | 22-Jun-2022 11:14    | 0960_MW104_220622  | ✓                 | ✓               | ✓                | ✓                |
| EP2207727-009        | 22-Jun-2022 12:00    | 0960_MW102_220622  | ✓                 | ✓               | ✓                | ✓                |
| EP2207727-010        | 22-Jun-2022 15:35    | 0960_MW159_220622  | ✓                 | ✓               | ✓                | ✓                |
| EP2207727-011        | 22-Jun-2022 15:40    | 0960_MW170_220622  | ✓                 | ✓               | ✓                | ✓                |
| EP2207727-012        | 22-Jun-2022 15:41    | 0960_MW172_220622  | ✓                 | ✓               | ✓                | ✓                |
| EP2207727-013        | 22-Jun-2022 16:12    | 0960_MW124_220622  | ✓                 | ✓               | ✓                | ✓                |
| EP2207727-014        | 22-Jun-2022 17:37    | 0960_QC301_220622  |                   | ✓               |                  |                  |
| EP2207727-015        | 22-Jun-2022 17:37    | 0960_QC302_220622  |                   | ✓               |                  |                  |
| EP2207727-016        | 22-Jun-2022 17:38    | 0960_QC303_220622  |                   | ✓               |                  |                  |
| EP2207727-017        | 22-Jun-2022 17:39    | 0960_QC401_220622  |                   | ✓               |                  |                  |
| EP2207727-018        | 22-Jun-2022 17:39    | 0960_QC402_220622  |                   | ✓               |                  |                  |
| EP2207727-019        | 22-Jun-2022 17:40    | 0960_QC403_220622  |                   | ✓               |                  |                  |

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

|                         |                                                                |       |                              |
|-------------------------|----------------------------------------------------------------|-------|------------------------------|
| [REDACTED]              | - A4 - AU Tax Invoice (INV)                                    | Email | [REDACTED]@cardno.com.au     |
| <b>DERP LAB REPORTS</b> |                                                                |       |                              |
| [REDACTED]              | - EDI Format - ESDAT (ESDAT)                                   | Email | derp.labreports@esdat.com.au |
| [REDACTED]              | - *AU Certificate of Analysis - NATA (COA)                     | Email | [REDACTED]@stantec.com       |
| [REDACTED]              | - *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)    | Email | [REDACTED]@stantec.com       |
| [REDACTED]              | - *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)            | Email | [REDACTED]@stantec.com       |
| [REDACTED]              | - A4 - AU Sample Receipt Notification - Environmental HT (SRN) | Email | [REDACTED]@stantec.com       |
| [REDACTED]              | - Chain of Custody (CoC) (COC)                                 | Email | [REDACTED]@stantec.com       |
| [REDACTED]              | - EDI Format - ESDAT (ESDAT)                                   | Email | [REDACTED]@stantec.com       |
| [REDACTED]              | - EDI Format - XTab (XTAB)                                     | Email | [REDACTED]@stantec.com       |

## CERTIFICATE OF ANALYSIS

**Work Order** : **EP2207727**  
**Client** : **STANTEC AUSTRALIA PTY LTD**  
**Contact** : [REDACTED]  
**Address** : GROUND FLOOR 226 ADELAIDE TERRACE  
 PERTH 6000  
**Telephone** : ----  
**Project** : WA\_0960\_PFASOMP  
**Order number** : pfas-omp Learmonth  
**C-O-C number** : 39222  
**Sampler** : [REDACTED]  
**Site** : Learmonth GW - MB  
**Quote number** : SY/139/19 B  
**No. of samples received** : 19  
**No. of samples analysed** : 19

**Page** : 1 of 16  
**Laboratory** : Environmental Division Perth  
**Contact** : [REDACTED]  
**Address** : 26 Rigali Way Wangara Western Australia Australia 6065  
**Telephone** : +6138549 9609  
**Date Samples Received** : 27-Jun-2022 11:40  
**Date Analysis Commenced** : 28-Jun-2022  
**Issue Date** : 08-Jul-2022 18:00



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>                |
|------------------------------------------------------------------------|----------------------------|----------------------------------------------|
| <span style="background-color: black; color: black;">[REDACTED]</span> | Laboratory Manager (Perth) | Perth Inorganics, Wangara, Western Australia |
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator           | Sydney Organics, Smithfield, NSW             |



## 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.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- 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.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, 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: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                                   |             |      |       | 0960_MW151_220622 | 0960_MW238_220622 | 0960_MW148S_220622<br>2 | 0960_QC116_220622 | 0960_MW148D_220622<br>2 |
|-------------------------------------------------------------------|-------------|------|-------|-------------------|-------------------|-------------------------|-------------------|-------------------------|
| Sampling date / time                                              |             |      |       | 22-Jun-2022 08:45 | 22-Jun-2022 09:03 | 22-Jun-2022 09:43       | 22-Jun-2022 09:44 | 22-Jun-2022 09:45       |
| Compound                                                          | CAS Number  | LOR  | Unit  | EP2207727-001     | EP2207727-002     | EP2207727-003           | EP2207727-004     | EP2207727-005           |
|                                                                   |             |      |       | Result            | Result            | Result                  | Result            | Result                  |
| <b>ED037P: Alkalinity by PC Titrator</b>                          |             |      |       |                   |                   |                         |                   |                         |
| Hydroxide Alkalinity as CaCO <sub>3</sub>                         | DMO-210-001 | 1    | mg/L  | <1                | <1                | <1                      | <1                | <1                      |
| Carbonate Alkalinity as CaCO <sub>3</sub>                         | 3812-32-6   | 1    | mg/L  | <1                | <1                | <1                      | <1                | <1                      |
| Bicarbonate Alkalinity as CaCO <sub>3</sub>                       | 71-52-3     | 1    | mg/L  | 690               | 835               | 369                     | 360               | 176                     |
| Total Alkalinity as CaCO <sub>3</sub>                             | ----        | 1    | mg/L  | 690               | 835               | 369                     | 360               | 176                     |
| <b>ED041G: Sulfate (Turbidimetric) as SO<sub>4</sub> 2- by DA</b> |             |      |       |                   |                   |                         |                   |                         |
| Sulfate as SO <sub>4</sub> - Turbidimetric                        | 14808-79-8  | 1    | mg/L  | 592               | 1080              | 1700                    | 1790              | 4150                    |
| <b>ED045G: Chloride by Discrete Analyser</b>                      |             |      |       |                   |                   |                         |                   |                         |
| Chloride                                                          | 16887-00-6  | 1    | mg/L  | 4640              | 649               | 14400                   | 15300             | 32300                   |
| <b>ED093F: Dissolved Major Cations</b>                            |             |      |       |                   |                   |                         |                   |                         |
| Calcium                                                           | 7440-70-2   | 1    | mg/L  | 145               | 18                | 548                     | 586               | 925                     |
| Magnesium                                                         | 7439-95-4   | 1    | mg/L  | 268               | 32                | 1020                    | 1100              | 1860                    |
| Sodium                                                            | 7440-23-5   | 1    | mg/L  | 2980              | 1140              | 8260                    | 8900              | 16800                   |
| Potassium                                                         | 7440-09-7   | 1    | mg/L  | 132               | 69                | 395                     | 426               | 826                     |
| <b>EN055: Ionic Balance</b>                                       |             |      |       |                   |                   |                         |                   |                         |
| ∅ Total Anions                                                    | ----        | 0.01 | meq/L | 157               | 57.5              | 449                     | 476               | 1000                    |
| ∅ Total Cations                                                   | ----        | 0.01 | meq/L | 162               | 54.9              | 481                     | 518               | 951                     |
| ∅ Ionic Balance                                                   | ----        | 0.01 | %     | 1.66              | 2.31              | 3.41                    | 4.20              | 2.56                    |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>                      |             |      |       |                   |                   |                         |                   |                         |
| Perfluorobutane sulfonic acid (PFBS)                              | 375-73-5    | 0.02 | µg/L  | 2.95              | 1.07              | 8.61                    | 7.88              | 1.00                    |
| Perfluoropentane sulfonic acid (PFPeS)                            | 2706-91-4   | 0.02 | µg/L  | 3.97              | 1.07              | 6.34                    | 6.35              | 0.87                    |
| Perfluorohexane sulfonic acid (PFHxS)                             | 355-46-4    | 0.01 | µg/L  | 29.6              | 8.85              | 28.4                    | 28.1              | 3.74                    |
| Perfluoroheptane sulfonic acid (PFHpS)                            | 375-92-8    | 0.02 | µg/L  | 3.27              | 0.83              | 2.37                    | 2.33              | 0.29                    |
| Perfluorooctane sulfonic acid (PFOS)                              | 1763-23-1   | 0.01 | µg/L  | 28.8              | 11.4              | 21.2                    | 20.6              | 2.20                    |
| Perfluorodecane sulfonic acid (PFDS)                              | 335-77-3    | 0.02 | µg/L  | <0.02             | <0.02             | <0.02                   | <0.02             | <0.02                   |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>                    |             |      |       |                   |                   |                         |                   |                         |
| Perfluorobutanoic acid (PFBA)                                     | 375-22-4    | 0.1  | µg/L  | 1.1               | 0.4               | 1.6                     | 1.5               | 0.2                     |
| Perfluoropentanoic acid (PFPeA)                                   | 2706-90-3   | 0.02 | µg/L  | 1.82              | 0.94              | 2.38                    | 2.27              | 0.30                    |
| Perfluorohexanoic acid (PFHxA)                                    | 307-24-4    | 0.02 | µg/L  | 9.90              | 4.34              | 9.52                    | 9.15              | 1.26                    |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_MW151_220622 | 0960_MW238_220622 | 0960_MW148S_220622<br>2 | 0960_QC116_220622 | 0960_MW148D_220622<br>2 |
|------------------------------------------------------------|-------------|------|------|-------------------|-------------------|-------------------------|-------------------|-------------------------|
| Sampling date / time                                       |             |      |      | 22-Jun-2022 08:45 | 22-Jun-2022 09:03 | 22-Jun-2022 09:43       | 22-Jun-2022 09:44 | 22-Jun-2022 09:45       |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2207727-001     | EP2207727-002     | EP2207727-003           | EP2207727-004     | EP2207727-005           |
|                                                            |             |      |      | Result            | Result            | Result                  | Result            | Result                  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                   |                   |                         |                   |                         |
| Perfluoroheptanoic acid (PFHpA)                            | 375-85-9    | 0.02 | µg/L | 0.80              | 0.36              | 1.22                    | 1.12              | 0.15                    |
| Perfluorooctanoic acid (PFOA)                              | 335-67-1    | 0.01 | µg/L | 2.05              | 0.59              | 1.67                    | 1.60              | 0.21                    |
| Perfluorononanoic acid (PFNA)                              | 375-95-1    | 0.02 | µg/L | 0.03              | <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                   |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                   |                   |                         |                   |                         |
| Perfluorooctane sulfonamide (FOSA)                         | 754-91-6    | 0.02 | µg/L | <0.02             | 0.03              | <0.02                   | <0.02             | <0.02                   |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)              | 31506-32-8  | 0.05 | µg/L | <0.05             | <0.05             | <0.05                   | <0.05             | <0.05                   |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)               | 4151-50-2   | 0.05 | µg/L | <0.05             | <0.05             | <0.05                   | <0.05             | <0.05                   |
| N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)       | 24448-09-7  | 0.05 | µg/L | <0.05             | <0.05             | <0.05                   | <0.05             | <0.05                   |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)        | 1691-99-2   | 0.05 | µg/L | <0.05             | <0.05             | <0.05                   | <0.05             | <0.05                   |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)  | 2355-31-9   | 0.02 | µg/L | <0.02             | <0.02             | <0.02                   | <0.02             | <0.02                   |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)   | 2991-50-6   | 0.02 | µg/L | <0.02             | <0.02             | <0.02                   | <0.02             | <0.02                   |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                   |                   |                         |                   |                         |
| 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                   |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_MW151_220622 | 0960_MW238_220622 | 0960_MW148S_220622<br>2 | 0960_QC116_220622 | 0960_MW148D_220622<br>2 |
|---------------------------------------------------------------|--------------------|------|------|-------------------|-------------------|-------------------------|-------------------|-------------------------|
| Sampling date / time                                          |                    |      |      | 22-Jun-2022 08:45 | 22-Jun-2022 09:03 | 22-Jun-2022 09:43       | 22-Jun-2022 09:44 | 22-Jun-2022 09:45       |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2207727-001     | EP2207727-002     | EP2207727-003           | EP2207727-004     | EP2207727-005           |
|                                                               |                    |      |      | Result            | Result            | Result                  | Result            | Result                  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                   |                   |                         |                   |                         |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05             | <0.05             | <0.05                   | <0.05             | <0.05                   |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                   |                   |                         |                   |                         |
| Sum of PFAS                                                   | ----               | 0.01 | µg/L | 84.3              | 29.9              | 83.3                    | 80.9              | 10.2                    |
| Sum of PFHxS and PFOS                                         | 355-46-4/1763-23-1 | 0.01 | µg/L | 58.4              | 20.2              | 49.6                    | 48.7              | 5.94                    |
| Sum of PFAS (WA DER List)                                     | ----               | 0.01 | µg/L | 77.0              | 28.0              | 74.6                    | 72.2              | 9.06                    |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                   |                   |                         |                   |                         |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 92.0              | 96.0              | 97.1                    | 94.1              | 98.3                    |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 95.7              | 95.0              | 95.9                    | 98.7              | 98.4                    |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                                   |             |      |       | 0960_MW105_220622 | 0960_QC119_220622 | 0960_MW104_220622 | 0960_MW102_220622 | 0960_MW159_220622 |
|-------------------------------------------------------------------|-------------|------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                              |             |      |       | 22-Jun-2022 10:42 | 22-Jun-2022 10:43 | 22-Jun-2022 11:14 | 22-Jun-2022 12:00 | 22-Jun-2022 15:35 |
| Compound                                                          | CAS Number  | LOR  | Unit  | EP2207727-006     | EP2207727-007     | EP2207727-008     | EP2207727-009     | EP2207727-010     |
|                                                                   |             |      |       | Result            | Result            | Result            | Result            | Result            |
| <b>ED037P: Alkalinity by PC Titrator</b>                          |             |      |       |                   |                   |                   |                   |                   |
| Hydroxide Alkalinity as CaCO <sub>3</sub>                         | DMO-210-001 | 1    | mg/L  | <1                | <1                | <1                | <1                | <1                |
| Carbonate Alkalinity as CaCO <sub>3</sub>                         | 3812-32-6   | 1    | mg/L  | <1                | <1                | <1                | <1                | <1                |
| Bicarbonate Alkalinity as CaCO <sub>3</sub>                       | 71-52-3     | 1    | mg/L  | 351               | 344               | 207               | 139               | 461               |
| Total Alkalinity as CaCO <sub>3</sub>                             | ----        | 1    | mg/L  | 351               | 344               | 207               | 139               | 461               |
| <b>ED041G: Sulfate (Turbidimetric) as SO<sub>4</sub> 2- by DA</b> |             |      |       |                   |                   |                   |                   |                   |
| Sulfate as SO <sub>4</sub> - Turbidimetric                        | 14808-79-8  | 1    | mg/L  | 1620              | 1650              | 3970              | 4320              | 1210              |
| <b>ED045G: Chloride by Discrete Analyser</b>                      |             |      |       |                   |                   |                   |                   |                   |
| Chloride                                                          | 16887-00-6  | 1    | mg/L  | 15000             | 15100             | 27800             | 37300             | 8250              |
| <b>ED093F: Dissolved Major Cations</b>                            |             |      |       |                   |                   |                   |                   |                   |
| Calcium                                                           | 7440-70-2   | 1    | mg/L  | 596               | 556               | 729               | 1380              | 397               |
| Magnesium                                                         | 7439-95-4   | 1    | mg/L  | 1220              | 1140              | 2200              | 2240              | 574               |
| Sodium                                                            | 7440-23-5   | 1    | mg/L  | 8510              | 8120              | 17300             | 19200             | 4760              |
| Potassium                                                         | 7440-09-7   | 1    | mg/L  | 488               | 471               | 967               | 696               | 271               |
| <b>EN055: Ionic Balance</b>                                       |             |      |       |                   |                   |                   |                   |                   |
| ∅ Total Anions                                                    | ----        | 0.01 | meq/L | 464               | 467               | 871               | 1140              | 267               |
| ∅ Total Cations                                                   | ----        | 0.01 | meq/L | 513               | 487               | 995               | 1110              | 281               |
| ∅ Ionic Balance                                                   | ----        | 0.01 | %     | 5.01              | 2.06              | 6.63              | 1.72              | 2.54              |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>                      |             |      |       |                   |                   |                   |                   |                   |
| Perfluorobutane sulfonic acid (PFBS)                              | 375-73-5    | 0.02 | µg/L  | 0.18              | 0.15              | 0.04              | <0.02             | <0.02             |
| Perfluoropentane sulfonic acid (PFPeS)                            | 2706-91-4   | 0.02 | µg/L  | 0.20              | 0.20              | <0.02             | <0.02             | <0.02             |
| Perfluorohexane sulfonic acid (PFHxS)                             | 355-46-4    | 0.01 | µg/L  | 0.92              | 0.86              | 0.08              | <0.01             | <0.01             |
| Perfluoroheptane sulfonic acid (PFHpS)                            | 375-92-8    | 0.02 | µg/L  | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| Perfluorooctane sulfonic acid (PFOS)                              | 1763-23-1   | 0.01 | µg/L  | 0.04              | 0.05              | <0.01             | <0.01             | <0.01             |
| Perfluorodecane sulfonic acid (PFDS)                              | 335-77-3    | 0.02 | µg/L  | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>                    |             |      |       |                   |                   |                   |                   |                   |
| 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  | 0.19              | 0.17              | <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             |





## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_MW105_220622 | 0960_QC119_220622 | 0960_MW104_220622 | 0960_MW102_220622 | 0960_MW159_220622 |
|------------------------------------------------------------|-------------|------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                       |             |      |      | 22-Jun-2022 10:42 | 22-Jun-2022 10:43 | 22-Jun-2022 11:14 | 22-Jun-2022 12:00 | 22-Jun-2022 15:35 |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2207727-006     | EP2207727-007     | EP2207727-008     | EP2207727-009     | EP2207727-010     |
|                                                            |             |      |      | Result            | Result            | Result            | Result            | Result            |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                   |                   |                   |                   |                   |
| 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             |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                   |                   |                   |                   |                   |
| Perfluorooctane sulfonamide (FOSA)                         | 754-91-6    | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)              | 31506-32-8  | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)               | 4151-50-2   | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)       | 24448-09-7  | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)        | 1691-99-2   | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)  | 2355-31-9   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)   | 2991-50-6   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                   |                   |                   |                   |                   |
| 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             |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_MW105_220622 | 0960_QC119_220622 | 0960_MW104_220622 | 0960_MW102_220622 | 0960_MW159_220622 |
|---------------------------------------------------------------|--------------------|------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                          |                    |      |      | 22-Jun-2022 10:42 | 22-Jun-2022 10:43 | 22-Jun-2022 11:14 | 22-Jun-2022 12:00 | 22-Jun-2022 15:35 |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2207727-006     | EP2207727-007     | EP2207727-008     | EP2207727-009     | EP2207727-010     |
|                                                               |                    |      |      | Result            | Result            | Result            | Result            | Result            |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                   |                   |                   |                   |                   |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                   |                   |                   |                   |                   |
| Sum of PFAS                                                   | ----               | 0.01 | µg/L | 1.58              | 1.48              | 0.12              | <0.01             | <0.01             |
| Sum of PFHxS and PFOS                                         | 355-46-4/1763-23-1 | 0.01 | µg/L | 0.96              | 0.91              | 0.08              | <0.01             | <0.01             |
| Sum of PFAS (WA DER List)                                     | ----               | 0.01 | µg/L | 1.38              | 1.28              | 0.12              | <0.01             | <0.01             |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 101               | 104               | 94.8              | 102               | 90.8              |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 97.3              | 95.1              | 97.5              | 96.6              | 93.9              |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                                   |             |      |       | 0960_MW170_220622 | 0960_MW172_220622 | 0960_MW124_220622 | ----  | ----  |
|-------------------------------------------------------------------|-------------|------|-------|-------------------|-------------------|-------------------|-------|-------|
| Sampling date / time                                              |             |      |       | 22-Jun-2022 15:40 | 22-Jun-2022 15:41 | 22-Jun-2022 16:12 | ----  | ----  |
| Compound                                                          | CAS Number  | LOR  | Unit  | EP2207727-011     | EP2207727-012     | EP2207727-013     | ----- | ----- |
|                                                                   |             |      |       | Result            | Result            | Result            | ----  | ----  |
| <b>ED037P: Alkalinity by PC Titrator</b>                          |             |      |       |                   |                   |                   |       |       |
| Hydroxide Alkalinity as CaCO <sub>3</sub>                         | DMO-210-001 | 1    | mg/L  | <1                | <1                | <1                | ----  | ----  |
| Carbonate Alkalinity as CaCO <sub>3</sub>                         | 3812-32-6   | 1    | mg/L  | <1                | <1                | <1                | ----  | ----  |
| Bicarbonate Alkalinity as CaCO <sub>3</sub>                       | 71-52-3     | 1    | mg/L  | 204               | 275               | 159               | ----  | ----  |
| Total Alkalinity as CaCO <sub>3</sub>                             | ----        | 1    | mg/L  | 204               | 275               | 159               | ----  | ----  |
| <b>ED041G: Sulfate (Turbidimetric) as SO<sub>4</sub> 2- by DA</b> |             |      |       |                   |                   |                   |       |       |
| Sulfate as SO <sub>4</sub> - Turbidimetric                        | 14808-79-8  | 1    | mg/L  | 1570              | 2450              | 4920              | ----  | ----  |
| <b>ED045G: Chloride by Discrete Analyser</b>                      |             |      |       |                   |                   |                   |       |       |
| Chloride                                                          | 16887-00-6  | 1    | mg/L  | 14100             | 10800             | 33400             | ----  | ----  |
| <b>ED093F: Dissolved Major Cations</b>                            |             |      |       |                   |                   |                   |       |       |
| Calcium                                                           | 7440-70-2   | 1    | mg/L  | 742               | 499               | 869               | ----  | ----  |
| Magnesium                                                         | 7439-95-4   | 1    | mg/L  | 947               | 692               | 2190              | ----  | ----  |
| Sodium                                                            | 7440-23-5   | 1    | mg/L  | 8290              | 7440              | 17600             | ----  | ----  |
| Potassium                                                         | 7440-09-7   | 1    | mg/L  | 222               | 269               | 901               | ----  | ----  |
| <b>EN055: Ionic Balance</b>                                       |             |      |       |                   |                   |                   |       |       |
| ∅ Total Anions                                                    | ----        | 0.01 | meq/L | 434               | 361               | 1050              | ----  | ----  |
| ∅ Total Cations                                                   | ----        | 0.01 | meq/L | 481               | 412               | 1010              | ----  | ----  |
| ∅ Ionic Balance                                                   | ----        | 0.01 | %     | 5.10              | 6.62              | 1.73              | ----  | ----  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>                      |             |      |       |                   |                   |                   |       |       |
| Perfluorobutane sulfonic acid (PFBS)                              | 375-73-5    | 0.02 | µg/L  | 0.05              | 0.61              | <0.02             | ----  | ----  |
| Perfluoropentane sulfonic acid (PFPeS)                            | 2706-91-4   | 0.02 | µg/L  | 0.06              | 0.83              | <0.02             | ----  | ----  |
| Perfluorohexane sulfonic acid (PFHxS)                             | 355-46-4    | 0.01 | µg/L  | 0.47              | 5.08              | <0.01             | ----  | ----  |
| Perfluoroheptane sulfonic acid (PFHpS)                            | 375-92-8    | 0.02 | µg/L  | <0.02             | 0.16              | <0.02             | ----  | ----  |
| Perfluorooctane sulfonic acid (PFOS)                              | 1763-23-1   | 0.01 | µg/L  | <0.01             | 1.22              | <0.01             | ----  | ----  |
| Perfluorodecane sulfonic acid (PFDS)                              | 335-77-3    | 0.02 | µg/L  | <0.02             | <0.02             | <0.02             | ----  | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>                    |             |      |       |                   |                   |                   |       |       |
| Perfluorobutanoic acid (PFBA)                                     | 375-22-4    | 0.1  | µg/L  | <0.1              | 0.2               | <0.1              | ----  | ----  |
| Perfluoropentanoic acid (PFPeA)                                   | 2706-90-3   | 0.02 | µg/L  | 0.03              | 0.58              | <0.02             | ----  | ----  |
| Perfluorohexanoic acid (PFHxA)                                    | 307-24-4    | 0.02 | µg/L  | 0.06              | 2.05              | <0.02             | ----  | ----  |
| Perfluoroheptanoic acid (PFHpA)                                   | 375-85-9    | 0.02 | µg/L  | <0.02             | 0.32              | <0.02             | ----  | ----  |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_MW170_220622 | 0960_MW172_220622 | 0960_MW124_220622 | ----  | ----  |
|------------------------------------------------------------|-------------|------|------|-------------------|-------------------|-------------------|-------|-------|
| Sampling date / time                                       |             |      |      | 22-Jun-2022 15:40 | 22-Jun-2022 15:41 | 22-Jun-2022 16:12 | ----  | ----  |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2207727-011     | EP2207727-012     | EP2207727-013     | ----- | ----- |
|                                                            |             |      |      | Result            | Result            | Result            | ----  | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                   |                   |                   |       |       |
| Perfluorooctanoic acid (PFOA)                              | 335-67-1    | 0.01 | µg/L | <0.01             | <b>0.30</b>       | <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             | ----  | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                   |                   |                   |       |       |
| 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             | ----  | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                   |                   |                   |       |       |
| 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             | ----  | ----  |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_MW170_220622 | 0960_MW172_220622 | 0960_MW124_220622 | ----  | ----  |
|---------------------------------------------------------------|--------------------|------|------|-------------------|-------------------|-------------------|-------|-------|
| Sampling date / time                                          |                    |      |      | 22-Jun-2022 15:40 | 22-Jun-2022 15:41 | 22-Jun-2022 16:12 | ----  | ----  |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2207727-011     | EP2207727-012     | EP2207727-013     | ----- | ----- |
|                                                               |                    |      |      | Result            | Result            | Result            | ----  | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                   |                   |                   |       |       |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | ----  | ----  |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                   |                   |                   |       |       |
| Sum of PFAS                                                   | ----               | 0.01 | µg/L | 0.67              | 11.4              | <0.01             | ----  | ----  |
| Sum of PFHxS and PFOS                                         | 355-46-4/1763-23-1 | 0.01 | µg/L | 0.47              | 6.30              | <0.01             | ----  | ----  |
| Sum of PFAS (WA DER List)                                     | ----               | 0.01 | µg/L | 0.61              | 10.4              | <0.01             | ----  | ----  |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                   |                   |                   |       |       |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 89.8              | 90.9              | 95.8              | ----  | ----  |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 96.1              | 94.2              | 99.6              | ----  | ----  |



## Analytical Results

Sub-Matrix: RINSATE  
 (Matrix: WATER)

Sample ID

| Sub-Matrix: RINSATE<br>(Matrix: WATER)        |            |      |      | Sample ID         | 0960_QC301_220622 | 0960_QC302_220622 | 0960_QC303_220622 | 0960_QC401_220622 | 0960_QC402_220622 |
|-----------------------------------------------|------------|------|------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                          |            |      |      | 22-Jun-2022 17:37 | 22-Jun-2022 17:37 | 22-Jun-2022 17:38 | 22-Jun-2022 17:39 | 22-Jun-2022 17:39 |                   |
| Compound                                      | CAS Number | LOR  | Unit | EP2207727-014     | EP2207727-015     | EP2207727-016     | EP2207727-017     | EP2207727-018     |                   |
|                                               |            |      |      | Result            | Result            | Result            | Result            | Result            |                   |
| EP231A: Perfluoroalkyl Sulfonic Acids         |            |      |      |                   |                   |                   |                   |                   |                   |
| Perfluorobutane sulfonic acid (PFBS)          | 375-73-5   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <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: RINSATE  
 (Matrix: WATER)

Sample ID

|                                                           |                    |      |      | 0960_QC301_220622 | 0960_QC302_220622 | 0960_QC303_220622 | 0960_QC401_220622 | 0960_QC402_220622 |
|-----------------------------------------------------------|--------------------|------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                      |                    |      |      | 22-Jun-2022 17:37 | 22-Jun-2022 17:37 | 22-Jun-2022 17:38 | 22-Jun-2022 17:39 | 22-Jun-2022 17:39 |
| Compound                                                  | CAS Number         | LOR  | Unit | EP2207727-014     | EP2207727-015     | EP2207727-016     | EP2207727-017     | EP2207727-018     |
|                                                           |                    |      |      | Result            | Result            | Result            | Result            | Result            |
| <b>EP231C: Perfluoroalkyl Sulfonamides - Continued</b>    |                    |      |      |                   |                   |                   |                   |                   |
| 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             |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>         |                    |      |      |                   |                   |                   |                   |                   |
| 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             |
| <b>EP231P: PFAS Sums</b>                                  |                    |      |      |                   |                   |                   |                   |                   |
| 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             |
| <b>EP231S: PFAS Surrogate</b>                             |                    |      |      |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                 | ----               | 0.02 | %    | 91.7              | 97.5              | 100               | 99.1              | 100               |
| 13C8-PFOA                                                 | ----               | 0.02 | %    | 97.5              | 94.2              | 97.0              | 97.6              | 96.6              |





## Analytical Results

Sub-Matrix: RINSATE  
 (Matrix: WATER)

Sample ID

0960\_QC403\_220622

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Sampling date / time

22-Jun-2022 17:40

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Compound

CAS Number

LOR

Unit

EP2207727-019

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Result

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### 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<br>(Matrix: WATER)                    |                    |      |      | Sample ID | 0960_QC403_220622 | ----  | ----  | ----  | ----  |
| Sampling date / time                                      |                    |      |      |           | 22-Jun-2022 17:40 | ----  | ----  | ----  | ----  |
| Compound                                                  | CAS Number         | LOR  | Unit |           | EP2207727-019     | ----- | ----- | ----- | ----- |
|                                                           |                    |      |      | 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 | %    | 92.9      |                   | ----  | ----  | ----  | ----  |
| 13C8-PFOA                                                 | ----               | 0.02 | %    | 95.7      |                   | ----  | ----  | ----  | ----  |



### Surrogate Control Limits

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

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

### Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (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              | : EP2207727                                       | Page                    | : 1 of 7                                                 |
| Client                  | : STANTEC AUSTRALIA PTY LTD                       | Laboratory              | : Environmental Division Perth                           |
| Contact                 | : [REDACTED]                                      | Contact                 | : [REDACTED]                                             |
| Address                 | : GROUND FLOOR 226 ADELAIDE TERRACE<br>PERTH 6000 | Address                 | : 26 Rigali Way Wangara Western Australia Australia 6065 |
| Telephone               | : ----                                            | Telephone               | : +6138549 9609                                          |
| Project                 | : WA_0960_PFASOMP                                 | Date Samples Received   | : 27-Jun-2022                                            |
| Order number            | : pfas-omp Learmonth                              | Date Analysis Commenced | : 28-Jun-2022                                            |
| C-O-C number            | : 39222                                           | Issue Date              | : 08-Jul-2022                                            |
| Sampler                 | : [REDACTED]                                      |                         |                                                          |
| Site                    | : Learmonth GW - MB                               |                         |                                                          |
| Quote number            | : SY/139/19 B                                     |                         |                                                          |
| No. of samples received | : 19                                              |                         |                                                          |
| No. of samples analysed | : 19                                              |                         |                                                          |



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

This Quality Control Report contains the following information:

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

### Signatories

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

| Signatories | Position                   | Accreditation Category                       |
|-------------|----------------------------|----------------------------------------------|
| [REDACTED]  | Laboratory Manager (Perth) | Perth Inorganics, Wangara, Western Australia |
| [REDACTED]  | LCMS Coordinator           | Sydney Organics, Smithfield, NSW             |



## 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**

| Sub-Matrix: WATER                                                 |                   |                                          |             | Laboratory Duplicate (DUP) Report |      |                 |                  |         |                    |
|-------------------------------------------------------------------|-------------------|------------------------------------------|-------------|-----------------------------------|------|-----------------|------------------|---------|--------------------|
| Laboratory sample ID                                              | Sample ID         | Method: Compound                         | CAS Number  | LOR                               | Unit | Original Result | Duplicate Result | RPD (%) | Acceptable RPD (%) |
| ED037P: Alkalinity by PC Titrator (QC Lot: 4445364)               |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207727-002                                                     | 0960_MW238_220622 | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 835             | 846              | 1.3     | 0% - 20%           |
|                                                                   |                   | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 835             | 846              | 1.3     | 0% - 20%           |
| EP2207727-012                                                     | 0960_MW172_220622 | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 275             | 288              | 4.7     | 0% - 20%           |
|                                                                   |                   | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 275             | 288              | 4.7     | 0% - 20%           |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4429739) |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207727-001                                                     | 0960_MW151_220622 | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 592             | 594              | 0.4     | 0% - 20%           |
| EP2207727-011                                                     | 0960_MW170_220622 | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 1570            | 1570             | 0.4     | 0% - 20%           |
| ED045G: Chloride by Discrete Analyser (QC Lot: 4429738)           |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207727-001                                                     | 0960_MW151_220622 | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 4640            | 4660             | 0.4     | 0% - 20%           |
| EP2207727-011                                                     | 0960_MW170_220622 | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 14100           | 14200            | 0.5     | 0% - 20%           |
| ED093F: Dissolved Major Cations (QC Lot: 4427080)                 |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207727-001                                                     | 0960_MW151_220622 | ED093F: Calcium                          | 7440-70-2   | 1                                 | mg/L | 145             | 144              | 0.0     | 0% - 20%           |
|                                                                   |                   | ED093F: Magnesium                        | 7439-95-4   | 1                                 | mg/L | 268             | 269              | 0.0     | 0% - 20%           |
|                                                                   |                   | ED093F: Sodium                           | 7440-23-5   | 1                                 | mg/L | 2980            | 3010             | 1.2     | 0% - 20%           |
|                                                                   |                   | ED093F: Potassium                        | 7440-09-7   | 1                                 | mg/L | 132             | 133              | 1.3     | 0% - 20%           |
| EP2207727-011                                                     | 0960_MW170_220622 | ED093F: Calcium                          | 7440-70-2   | 1                                 | mg/L | 742             | 738              | 0.6     | 0% - 20%           |
|                                                                   |                   | ED093F: Magnesium                        | 7439-95-4   | 1                                 | mg/L | 947             | 938              | 0.9     | 0% - 20%           |
|                                                                   |                   | ED093F: Sodium                           | 7440-23-5   | 1                                 | mg/L | 8290            | 8240             | 0.5     | 0% - 20%           |
|                                                                   |                   | ED093F: Potassium                        | 7440-09-7   | 1                                 | mg/L | 222             | 221              | 0.5     | 0% - 20%           |



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: 4438735)      |                   |                                                                   |             |                                   |      |                 |                  |         |                    |
| EP2207727-008                                                | 0960_MW104_220622 | EP231X: Perfluorohexane sulfonic acid (PFHxS)                     | 355-46-4    | 0.01                              | µg/L | 0.08            | 0.05             | 44.4    | 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            | 0.04             | 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: 4438735)    |                   |                                                                   |             |                                   |      |                 |                  |         |                    |
| EP2207727-008                                                | 0960_MW104_220622 | 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: 4438735)        |                   |                                                                   |             |                                   |      |                 |                  |         |                    |
| EP2207727-008                                                | 0960_MW104_220622 | 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: 4438735) |                   |                                                                   |             |                                   |      |                 |                  |         |                    |
| EP2207727-008                                                | 0960_MW104_220622 | 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: 4438735) - continued |                   |                                                     |             |                                   |      |                 |                  |         |                    |
| EP2207727-008                                                            | 0960_MW104_220622 | 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: 4438735)                                      |                   |                                                     |             |                                   |      |                 |                  |         |                    |
| EP2207727-008                                                            | 0960_MW104_220622 | EP231X: Sum of PFAS                                 | ----        | 0.01                              | µg/L | 0.12            | 0.09             | 28.6    | 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**

| Sub-Matrix: WATER                                                |                 |      |      | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |      |
|------------------------------------------------------------------|-----------------|------|------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|------|
|                                                                  |                 |      |      |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |      |
| Method: Compound                                                 | CAS Number      | LOR  | Unit | Result                      |                                       |                           |                                   |      |
| ED037P: Alkalinity by PC Titrator (QCLot: 4445364)               |                 |      |      |                             |                                       |                           |                                   |      |
| ED037-P: Hydroxide Alkalinity as CaCO3                           | DMO-210-00<br>1 | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Carbonate Alkalinity as CaCO3                           | 3812-32-6       | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Bicarbonate Alkalinity as CaCO3                         | 71-52-3         | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Total Alkalinity as CaCO3                               | ----            | 1    | mg/L | <1                          | 20 mg/L                               | 105                       | 87.8                              | 118  |
|                                                                  |                 |      |      | <1                          | 200 mg/L                              | 97.1                      | 87.8                              | 118  |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4429739) |                 |      |      |                             |                                       |                           |                                   |      |
| ED041G: Sulfate as SO4 - Turbidimetric                           | 14808-79-8      | 1    | mg/L | <1                          | 25 mg/L                               | 93.3                      | 89.9                              | 112  |
|                                                                  |                 |      |      | <1                          | 500 mg/L                              | 96.1                      | 89.9                              | 112  |
| ED045G: Chloride by Discrete Analyser (QCLot: 4429738)           |                 |      |      |                             |                                       |                           |                                   |      |
| ED045G: Chloride                                                 | 16887-00-6      | 1    | mg/L | <1                          | 10 mg/L                               | 97.2                      | 88.6                              | 113  |
|                                                                  |                 |      |      | <1                          | 1000 mg/L                             | 96.8                      | 88.6                              | 113  |
| ED093F: Dissolved Major Cations (QCLot: 4427080)                 |                 |      |      |                             |                                       |                           |                                   |      |
| ED093F: Calcium                                                  | 7440-70-2       | 1    | mg/L | <1                          | 50 mg/L                               | 90.7                      | 86.5                              | 117  |
| ED093F: Magnesium                                                | 7439-95-4       | 1    | mg/L | <1                          | 50 mg/L                               | 93.2                      | 88.4                              | 110  |
| ED093F: Sodium                                                   | 7440-23-5       | 1    | mg/L | <1                          | 50 mg/L                               | 105                       | 91.4                              | 113  |
| ED093F: Potassium                                                | 7440-09-7       | 1    | mg/L | <1                          | 50 mg/L                               | 94.6                      | 84.6                              | 108  |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4438735)           |                 |      |      |                             |                                       |                           |                                   |      |
| EP231X: Perfluorobutane sulfonic acid (PFBS)                     | 375-73-5        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 128                       | 72.0                              | 130  |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)                   | 2706-91-4       | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 113                       | 71.0                              | 127  |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)                    | 355-46-4        | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 125                       | 68.0                              | 131  |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)                   | 375-92-8        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 129                       | 69.0                              | 134  |
| EP231X: Perfluorooctane sulfonic acid (PFOS)                     | 1763-23-1       | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 130                       | 65.0                              | 140  |
| EP231X: Perfluorodecane sulfonic acid (PFDS)                     | 335-77-3        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 137                       | 53.0                              | 142  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4438735)         |                 |      |      |                             |                                       |                           |                                   |      |
| 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                             | 116                       | 72.0                              | 129  |
| EP231X: Perfluorohexanoic acid (PFHxA)                           | 307-24-4        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 128                       | 72.0                              | 129  |
| EP231X: Perfluoroheptanoic acid (PFHpA)                          | 375-85-9        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 119                       | 72.0                              | 130  |
| EP231X: Perfluorooctanoic acid (PFOA)                            | 335-67-1        | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 133                       | 71.0                              | 133  |
| EP231X: Perfluorononanoic acid (PFNA)                            | 375-95-1        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 120                       | 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                             | 120                       | 69.0                              | 133  |
| EP231X: Perfluorododecanoic acid (PFDoDA)                        | 307-55-1        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 113                       | 72.0                              | 134  |



Sub-Matrix: **WATER**

| Sub-Matrix: WATER                                                    |             |      |      | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |     |
|----------------------------------------------------------------------|-------------|------|------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|-----|
|                                                                      |             |      |      |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |     |
| Method: Compound                                                     | CAS Number  | LOR  | Unit | Result                      |                                       |                           |                                   |     |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4438735) - continued |             |      |      |                             |                                       |                           |                                   |     |
| EP231X: Perfluorotridecanoic acid (PFTrDA)                           | 72629-94-8  | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 136                       | 65.0                              | 144 |
| EP231X: Perfluorotetradecanoic acid (PFTeDA)                         | 376-06-7    | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 116                       | 71.0                              | 132 |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4438735)                 |             |      |      |                             |                                       |                           |                                   |     |
| EP231X: Perfluorooctane sulfonamide (FOSA)                           | 754-91-6    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 125                       | 67.0                              | 137 |
| EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)                | 31506-32-8  | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 137                       | 68.0                              | 141 |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)                 | 4151-50-2   | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 128                       | 62.6                              | 147 |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)         | 24448-09-7  | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 130                       | 66.0                              | 145 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)          | 1691-99-2   | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 114                       | 57.6                              | 145 |
| EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)    | 2355-31-9   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 133                       | 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 |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4438735)          |             |      |      |                             |                                       |                           |                                   |     |
| EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                    | 757124-72-4 | 0.05 | µg/L | <0.05                       | 0.25 µg/L                             | 134                       | 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                             | 138                       | 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                             | 127                       | 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                             | 136                       | 71.4                              | 144 |

## Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

|                                                                         |                   |                                                |            | Matrix Spike (MS) Report |                        |                       |      |
|-------------------------------------------------------------------------|-------------------|------------------------------------------------|------------|--------------------------|------------------------|-----------------------|------|
|                                                                         |                   |                                                |            | Spike<br>Concentration   | SpikeRecovery(%)<br>MS | Acceptable Limits (%) |      |
| Laboratory sample ID                                                    | Sample ID         | Method: Compound                               | CAS Number |                          |                        | Low                   | High |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4429739)</b> |                   |                                                |            |                          |                        |                       |      |
| EP2207727-001                                                           | 0960_MW151_220622 | ED041G: Sulfate as SO4 - Turbidimetric         | 14808-79-8 | 100 mg/L                 | # Not Determined       | 70.4                  | 130  |
| <b>ED045G: Chloride by Discrete Analyser (QCLot: 4429738)</b>           |                   |                                                |            |                          |                        |                       |      |
| EP2207727-001                                                           | 0960_MW151_220622 | ED045G: Chloride                               | 16887-00-6 | 1000 mg/L                | # Not Determined       | 70.0                  | 130  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4438735)</b>           |                   |                                                |            |                          |                        |                       |      |
| EP2207727-010                                                           | 0960_MW159_220622 | EP231X: Perfluorobutane sulfonic acid (PFBS)   | 375-73-5   | 0.25 µg/L                | 121                    | 72.0                  | 130  |
|                                                                         |                   | EP231X: Perfluoropentane sulfonic acid (PFPeS) | 2706-91-4  | 0.25 µg/L                | 116                    | 71.0                  | 127  |
|                                                                         |                   | EP231X: Perfluorohexane sulfonic acid (PFHxS)  | 355-46-4   | 0.25 µg/L                | 106                    | 68.0                  | 131  |
|                                                                         |                   | EP231X: Perfluoroheptane sulfonic acid (PFHpS) | 375-92-8   | 0.25 µg/L                | 134                    | 69.0                  | 134  |



Sub-Matrix: **WATER**

| 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: 4438735) - continued |                   |                                                                   |             |                          |                  |                       |      |
| EP2207727-010                                                      | 0960_MW159_220622 | EP231X: Perfluorooctane sulfonic acid (PFOS)                      | 1763-23-1   | 0.25 µg/L                | 127              | 65.0                  | 140  |
|                                                                    |                   | EP231X: Perfluorodecane sulfonic acid (PFDS)                      | 335-77-3    | 0.25 µg/L                | 130              | 53.0                  | 142  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4438735)           |                   |                                                                   |             |                          |                  |                       |      |
| EP2207727-010                                                      | 0960_MW159_220622 | EP231X: Perfluorobutanoic acid (PFBA)                             | 375-22-4    | 1.25 µg/L                | 101              | 73.0                  | 129  |
|                                                                    |                   | EP231X: Perfluoropentanoic acid (PFPeA)                           | 2706-90-3   | 0.25 µg/L                | 126              | 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                | 111              | 72.0                  | 130  |
|                                                                    |                   | EP231X: Perfluorooctanoic acid (PFOA)                             | 335-67-1    | 0.25 µg/L                | 129              | 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                | 128              | 71.0                  | 129  |
|                                                                    |                   | EP231X: Perfluoroundecanoic acid (PFUnDA)                         | 2058-94-8   | 0.25 µg/L                | 131              | 69.0                  | 133  |
|                                                                    |                   | EP231X: Perfluorododecanoic acid (PFDoDA)                         | 307-55-1    | 0.25 µg/L                | 131              | 72.0                  | 134  |
|                                                                    |                   | EP231X: Perfluorotridecanoic acid (PFTrDA)                        | 72629-94-8  | 0.25 µg/L                | 125              | 65.0                  | 144  |
|                                                                    |                   | EP231X: Perfluorotetradecanoic acid (PFTeDA)                      | 376-06-7    | 0.625 µg/L               | 118              | 71.0                  | 132  |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4438735)               |                   |                                                                   |             |                          |                  |                       |      |
| EP2207727-010                                                      | 0960_MW159_220622 | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.25 µg/L                | 130              | 67.0                  | 137  |
|                                                                    |                   | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.625 µg/L               | 116              | 68.0                  | 141  |
|                                                                    |                   | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.625 µg/L               | 113              | 62.6                  | 147  |
|                                                                    |                   | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.625 µg/L               | 113              | 66.0                  | 145  |
|                                                                    |                   | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.625 µg/L               | 114              | 57.6                  | 145  |
|                                                                    |                   | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9   | 0.25 µg/L                | 133              | 65.0                  | 136  |
|                                                                    |                   | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.25 µg/L                | 96.0             | 61.0                  | 135  |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4438735)        |                   |                                                                   |             |                          |                  |                       |      |
| EP2207727-010                                                      | 0960_MW159_220622 | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.25 µg/L                | 127              | 63.0                  | 143  |
|                                                                    |                   | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 27619-97-2  | 0.25 µg/L                | 134              | 64.0                  | 140  |
|                                                                    |                   | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | 39108-34-4  | 0.25 µg/L                | 120              | 67.0                  | 138  |
|                                                                    |                   | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | 120226-60-0 | 0.25 µg/L                | 127              | 71.4                  | 144  |

## QA/QC Compliance Assessment to assist with Quality Review

Work Order : EP2207727

Page : 1 of 7

Client : STANTEC AUSTRALIA PTY LTD  
Contact :   
Project : WA\_0960\_PFASOMP  
Site : Learmonth GW - MB  
Sampler :   
Order number : pfas-omp Learmonth

Laboratory : Environmental Division Perth  
Telephone : +6138549 9609  
Date Samples Received : 27-Jun-2022  
Issue Date : 08-Jul-2022  
No. of samples received : 19  
No. of samples analysed : 19

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

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

### Summary of Outliers

#### Outliers : Quality Control Samples

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

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

#### Outliers : Analysis Holding Time Compliance

- Analysis Holding Time Outliers exist - please see following pages for full details.

#### Outliers : Frequency of Quality Control Samples

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





Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                                                                                                                | Sample Date                                                                                                      | Extraction / Preparation |                    |            | Analysis      |                  |               |
|---------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------|------------|---------------|------------------|---------------|
| Container / Client Sample ID(s)                                                                                                       |                                                                                                                  | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation    |
| ED037P: Alkalinity by PC Titrator                                                                                                     |                                                                                                                  |                          |                    |            |               |                  |               |
| Clear Plastic Bottle - Natural (ED037-P)                                                                                              |                                                                                                                  |                          |                    |            |               |                  |               |
| 0960_MW151_220622, 0960_MW148S_220622, 0960_MW148D_220622, 0960_QC119_220622, 0960_MW102_220622, 0960_MW170_220622, 0960_MW124_220622 | 0960_MW238_220622, 0960_QC116_220622, 0960_MW105_220622, 0960_MW104_220622, 0960_MW159_220622, 0960_MW172_220622 | 22-Jun-2022              | ----               | ----       | ----          | 07-Jul-2022      | 06-Jul-2022 ✖ |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA                                                                                       |                                                                                                                  |                          |                    |            |               |                  |               |
| Clear Plastic Bottle - Natural (ED041G)                                                                                               |                                                                                                                  |                          |                    |            |               |                  |               |
| 0960_MW151_220622, 0960_MW148S_220622, 0960_MW148D_220622, 0960_QC119_220622, 0960_MW102_220622, 0960_MW170_220622, 0960_MW124_220622 | 0960_MW238_220622, 0960_QC116_220622, 0960_MW105_220622, 0960_MW104_220622, 0960_MW159_220622, 0960_MW172_220622 | 22-Jun-2022              | ----               | ----       | ----          | 05-Jul-2022      | 20-Jul-2022 ✔ |
| ED045G: Chloride by Discrete Analyser                                                                                                 |                                                                                                                  |                          |                    |            |               |                  |               |
| Clear Plastic Bottle - Natural (ED045G)                                                                                               |                                                                                                                  |                          |                    |            |               |                  |               |
| 0960_MW151_220622, 0960_MW148S_220622, 0960_MW148D_220622, 0960_QC119_220622, 0960_MW102_220622, 0960_MW170_220622, 0960_MW124_220622 | 0960_MW238_220622, 0960_QC116_220622, 0960_MW105_220622, 0960_MW104_220622, 0960_MW159_220622, 0960_MW172_220622 | 22-Jun-2022              | ----               | ----       | ----          | 05-Jul-2022      | 20-Jul-2022 ✔ |
| ED093F: Dissolved Major Cations                                                                                                       |                                                                                                                  |                          |                    |            |               |                  |               |
| Clear Plastic Bottle - Natural (ED093F)                                                                                               |                                                                                                                  |                          |                    |            |               |                  |               |
| 0960_MW151_220622, 0960_MW148S_220622, 0960_MW148D_220622, 0960_QC119_220622, 0960_MW102_220622, 0960_MW170_220622, 0960_MW124_220622 | 0960_MW238_220622, 0960_QC116_220622, 0960_MW105_220622, 0960_MW104_220622, 0960_MW159_220622, 0960_MW172_220622 | 22-Jun-2022              | ----               | ----       | ----          | 28-Jun-2022      | 29-Jun-2022 ✔ |

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                  |                    |  | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |
|-----------------------------------------|--------------------|--|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|
| Container / Client Sample ID(s)         |                    |  |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| EP231A: Perfluoroalkyl Sulfonic Acids   |                    |  |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                 |                    |  | 22-Jun-2022 | 05-Jul-2022              | 19-Dec-2022        | ✓          | 07-Jul-2022   | 19-Dec-2022      | ✓          |
| 0960_MW151_220622,                      | 0960_MW238_220622, |  |             |                          |                    |            |               |                  |            |
| 0960_MW148S_220622,                     | 0960_QC116_220622, |  |             |                          |                    |            |               |                  |            |
| 0960_MW148D_220622,                     | 0960_MW105_220622, |  |             |                          |                    |            |               |                  |            |
| 0960_QC119_220622,                      | 0960_MW104_220622, |  |             |                          |                    |            |               |                  |            |
| 0960_MW102_220622,                      | 0960_MW159_220622, |  |             |                          |                    |            |               |                  |            |
| 0960_MW170_220622,                      | 0960_MW172_220622, |  |             |                          |                    |            |               |                  |            |
| 0960_MW124_220622,                      | 0960_QC301_220622, |  |             |                          |                    |            |               |                  |            |
| 0960_QC302_220622,                      | 0960_QC303_220622, |  |             |                          |                    |            |               |                  |            |
| 0960_QC401_220622,                      | 0960_QC402_220622, |  |             |                          |                    |            |               |                  |            |
| 0960_QC403_220622                       |                    |  |             |                          |                    |            |               |                  |            |
| EP231B: Perfluoroalkyl Carboxylic Acids |                    |  |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                 |                    |  | 22-Jun-2022 | 05-Jul-2022              | 19-Dec-2022        | ✓          | 07-Jul-2022   | 19-Dec-2022      | ✓          |
| 0960_MW151_220622,                      | 0960_MW238_220622, |  |             |                          |                    |            |               |                  |            |
| 0960_MW148S_220622,                     | 0960_QC116_220622, |  |             |                          |                    |            |               |                  |            |
| 0960_MW148D_220622,                     | 0960_MW105_220622, |  |             |                          |                    |            |               |                  |            |
| 0960_QC119_220622,                      | 0960_MW104_220622, |  |             |                          |                    |            |               |                  |            |
| 0960_MW102_220622,                      | 0960_MW159_220622, |  |             |                          |                    |            |               |                  |            |
| 0960_MW170_220622,                      | 0960_MW172_220622, |  |             |                          |                    |            |               |                  |            |
| 0960_MW124_220622,                      | 0960_QC301_220622, |  |             |                          |                    |            |               |                  |            |
| 0960_QC302_220622,                      | 0960_QC303_220622, |  |             |                          |                    |            |               |                  |            |
| 0960_QC401_220622,                      | 0960_QC402_220622, |  |             |                          |                    |            |               |                  |            |
| 0960_QC403_220622                       |                    |  |             |                          |                    |            |               |                  |            |
| EP231C: Perfluoroalkyl Sulfonamides     |                    |  |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                 |                    |  | 22-Jun-2022 | 05-Jul-2022              | 19-Dec-2022        | ✓          | 07-Jul-2022   | 19-Dec-2022      | ✓          |
| 0960_MW151_220622,                      | 0960_MW238_220622, |  |             |                          |                    |            |               |                  |            |
| 0960_MW148S_220622,                     | 0960_QC116_220622, |  |             |                          |                    |            |               |                  |            |
| 0960_MW148D_220622,                     | 0960_MW105_220622, |  |             |                          |                    |            |               |                  |            |
| 0960_QC119_220622,                      | 0960_MW104_220622, |  |             |                          |                    |            |               |                  |            |
| 0960_MW102_220622,                      | 0960_MW159_220622, |  |             |                          |                    |            |               |                  |            |
| 0960_MW170_220622,                      | 0960_MW172_220622, |  |             |                          |                    |            |               |                  |            |
| 0960_MW124_220622,                      | 0960_QC301_220622, |  |             |                          |                    |            |               |                  |            |
| 0960_QC302_220622,                      | 0960_QC303_220622, |  |             |                          |                    |            |               |                  |            |
| 0960_QC401_220622,                      | 0960_QC402_220622, |  |             |                          |                    |            |               |                  |            |
| 0960_QC403_220622                       |                    |  |             |                          |                    |            |               |                  |            |



Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.



## Quality Control Parameter Frequency Compliance

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

Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

| Quality Control Sample Type                            |         | Count |         | Rate (%) |          |            | Quality Control Specification  |
|--------------------------------------------------------|---------|-------|---------|----------|----------|------------|--------------------------------|
| Analytical Methods                                     | Method  | QC    | Regular | Actual   | Expected | Evaluation |                                |
|                                                        |         |       |         |          |          |            |                                |
| Laboratory Duplicates (DUP)                            |         |       |         |          |          |            |                                |
| Alkalinity by Auto Titrator                            | ED037-P | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 19      | 5.26     | 10.00    | ✗          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Laboratory Control Samples (LCS)                       |         |       |         |          |          |            |                                |
| Alkalinity by Auto Titrator                            | ED037-P | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 19      | 5.26     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Method Blanks (MB)                                     |         |       |         |          |          |            |                                |
| Alkalinity by Auto Titrator                            | ED037-P | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 19      | 5.26     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Matrix Spikes (MS)                                     |         |       |         |          |          |            |                                |
| Chloride by Discrete Analyser                          | ED045G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 19      | 5.26     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |



## Brief Method Summaries

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

| Analytical Methods                                                 | Method       | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------------------|--------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alkalinity by Auto Titrator                                        | ED037-P      | WATER  | In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                                                                                                                                                                                                                |
| Sulfate (Turbidimetric) as SO <sub>4</sub> 2- by Discrete Analyser | ED041G       | WATER  | In house: Referenced to APHA 4500-SO <sub>4</sub> . Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO <sub>4</sub> suspension is measured by a photometer and the SO <sub>4</sub> -2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                         |
| Chloride by Discrete Analyser                                      | ED045G       | WATER  | In house: Referenced to APHA 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm.                                                                                                                                                                                                                                                                                                                                                                |
| Major Cations - Dissolved                                          | ED093F       | WATER  | In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                           |
| Ionic Balance by PCT DA and Turbi SO <sub>4</sub> DA               | * EN055 - PG | WATER  | In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS               | EP231X       | WATER  | In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements. |
| Preparation Methods                                                | Method       | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Solid Phase Extraction (SPE) for PFAS in water                     | ORG72        | WATER  | In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.                                                                                                                                                                                                |



# CHAIN OF CUSTODY

COC#: 39223

ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: Learmonth SW/OTH - MB

ORDER NO: pfas-omp Learmonth

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:

## SAMPLE DETAILS

## ANALYSIS REQUIRED

| SAMPLE | NAME         | DESCRIPTION | DATE / TIME         | MATRIX | TOTAL BOTTLES        | ON HOLD | Surface Waters WATER | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|--------------|-------------|---------------------|--------|----------------------|---------|----------------------|----------------------|------------------------|
| 001    | 0960_SW265 ✓ |             | 22/06/2022 11:43 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8          |                      |                        |
| 002    | 0960_QC121 ✓ |             | 22/06/2022 11:43 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8          |                      |                        |
| 003    | 0960_SW108 ✓ |             | 22/06/2022 12:09 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8          |                      |                        |
| 004    | 0960_SW170 ✓ |             | 22/06/2022 12:22 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8          |                      |                        |
| 005    | 0960_SW157 ✓ |             | 22/06/2022 03:39 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8          |                      |                        |



# CHAIN OF CUSTODY

COC#: 39223

ALS Laboratory: EP Perth

CLIENT: MWAHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: Learmonth SW/OTH - MB

ORDER NO: pfas-omp Learmonth

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:

| SAMPLE | SAMPLE NAME | PARTIAL ANALYSIS GROUP NAME | MATRIX | SELECTED ANALYSIS NAME                                                                                                                                                                                      |
|--------|-------------|-----------------------------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 001    | 0960_SW265  | Surface Waters WATER        | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 002    | 0960_QC121  | Surface Waters WATER        | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 003    | 0960_SW108  | Surface Waters WATER        | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 004    | 0960_SW170  | Surface Waters WATER        | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 005    | 0960_SW157  | Surface Waters WATER        | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |



# CHAIN OF CUSTODY

COC#: 39223

ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: Learmonth SW/OTH - MB

ORDER NO: pfas-omp Learmonth

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:

| SAMPLE | SAMPLE NAME | BOTTLE NAME                    | VOLUME | BARCODE        | TYPE  | FILTERED | REASON |
|--------|-------------|--------------------------------|--------|----------------|-------|----------|--------|
| 001    | 0960_SW265  | Clear Plastic Bottle - Natural | 500 mL | 00070621089959 | Green | No       |        |
| 001    | 0960_SW265  | HDPE (no PTFE)                 | 20 mL  | 00350821023831 | Grey  | No       |        |
| 001    | 0960_SW265  | HDPE (no PTFE)                 | 20 mL  | 00350821023996 | Grey  | No       |        |
| 002    | 0960_QC121  | HDPE (no PTFE)                 | 20 mL  | 00350821023817 | Grey  | No       |        |
| 002    | 0960_QC121  | HDPE (no PTFE)                 | 20 mL  | 00350821023894 | Grey  | No       |        |
| 002    | 0960_QC121  | Clear Plastic Bottle - Natural | 500 mL | 00070621089958 | Green | No       |        |
| 003    | 0960_SW108  | Clear Plastic Bottle - Natural | 500 mL | 00070621191206 | Green | No       |        |
| 003    | 0960_SW108  | HDPE (no PTFE)                 | 20 mL  | 00352101071795 | Grey  | No       |        |
| 003    | 0960_SW108  | HDPE (no PTFE)                 | 20 mL  | 00352101071217 | Grey  | No       |        |
| 004    | 0960_SW170  | Clear Plastic Bottle - Natural | 500 mL | 00070621191259 | Green | No       |        |
| 004    | 0960_SW170  | HDPE (no PTFE)                 | 20 mL  | 00352101071566 | Grey  | No       |        |
| 004    | 0960_SW170  | HDPE (no PTFE)                 | 20 mL  | 00352101038049 | Grey  | No       |        |
| 005    | 0960_SW157  | HDPE (no PTFE)                 | 20 mL  | 00352101071464 | Grey  | No       |        |
| 005    | 0960_SW157  | Clear Plastic Bottle - Natural | 500 mL | 00070621191143 | Green | No       |        |
| 005    | 0960_SW157  | HDPE (no PTFE)                 | 20 mL  | 00352101071983 | Grey  | No       |        |

Total Bottle Count: ALS: 15, Non ALS: 0

**SAMPLE RECEIPT NOTIFICATION (SRN)****Work Order : EP2207728**

Client : **STANTEC AUSTRALIA PTY LTD**  
Contact : [REDACTED]  
Address : GROUND FLOOR 226 ADELAIDE  
TERRACE  
PERTH 6000

Laboratory : Environmental Division Perth  
Contact : [REDACTED]  
Address : 26 Rigali Way Wangara Western  
Australia Australia 6065

E-mail : [REDACTED]@stantec.com  
Telephone : ----  
Facsimile : ----

E-mail : [REDACTED]@alsglobal.com  
Telephone : +6138549 9609  
Facsimile : +61-8-9406 1399

Project : WA\_0960\_PFSOMP  
Order number : pfas-omp Learmonth  
C-O-C number : 39223  
Site : Learmonth SW/OTH - [REDACTED]  
Sampler : [REDACTED]

Page : 1 of 2  
Quote number : ES2022MWHAUS0002 (SY/139/19 B)  
QC Level : NEPM 2013 B3 & ALS QC Standard

**Dates**

Date Samples Received : 27-Jun-2022 11:40  
Client Requested Due : 08-Jul-2022  
Date

Issue Date : 28-Jun-2022  
Scheduled Reporting Date : **08-Jul-2022**

**Delivery Details**

Mode of Delivery : Carrier  
No. of coolers/boxes : 5  
Receipt Detail :

Security Seal : Not Available  
Temperature : 13.9 - Ice present  
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
- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepancies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.



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

- ### Summary of Sample(s) and Requested Analysis

Matrix: WATER

| Laboratory sample ID | Sampling date / time | Sample ID         | WATER<br>Ionic Ba | WATER<br>PFAS - | WATER<br>Major C | WATER<br>Major A |
|----------------------|----------------------|-------------------|-------------------|-----------------|------------------|------------------|
| EP2207728-001        | 22-Jun-2022 11:43    | 0960_SW265_220622 | ✓                 | ✓               | ✓                | ✓                |
| EP2207728-002        | 22-Jun-2022 11:43    | 0960_QC121_220622 | ✓                 | ✓               | ✓                | ✓                |
| EP2207728-003        | 22-Jun-2022 12:09    | 0960_SW108_220622 | ✓                 | ✓               | ✓                | ✓                |
| EP2207728-004        | 22-Jun-2022 12:22    | 0960_SW170_220622 | ✓                 | ✓               | ✓                | ✓                |
| EP2207728-005        | 22-Jun-2022 15:39    | 0960_SW157_220622 | ✓                 | ✓               | ✓                | ✓                |

### Requested Deliverables

- |                                                                |       |                              |
|----------------------------------------------------------------|-------|------------------------------|
| - A4 - AU Tax Invoice (INV)                                    | Email | [REDACTED]@cardno.com.au     |
| <b>DERP LAB REPORTS</b>                                        |       |                              |
| - EDI Format - ESDAT (ESDAT)                                   | Email | derp.labreports@esdat.com.au |
| - *AU Certificate of Analysis - NATA (COA)                     | Email | [REDACTED]@stantec.com       |
| - *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)    | Email | [REDACTED]@stantec.com       |
| - *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)            | Email | [REDACTED]@stantec.com       |
| - A4 - AU Sample Receipt Notification - Environmental HT (SRN) | Email | [REDACTED]@stantec.com       |
| - Chain of Custody (CoC) (COC)                                 | Email | [REDACTED]@stantec.com       |
| - EDI Format - ESDAT (ESDAT)                                   | Email | [REDACTED]@stantec.com       |
| - EDI Format - XTab (XTAB)                                     | Email | [REDACTED]@stantec.com       |

## CERTIFICATE OF ANALYSIS

**Work Order** : **EP2207728**  
**Client** : **STANTEC AUSTRALIA PTY LTD**  
**Contact** : [REDACTED]  
**Address** : GROUND FLOOR 226 ADELAIDE TERRACE  
 PERTH 6000  
**Telephone** : ----  
**Project** : WA\_0960\_PFASOMP  
**Order number** : pfas-omp Learmonth  
**C-O-C number** : 39223  
**Sampler** : [REDACTED]  
**Site** : Learmonth SW/OTH - [REDACTED]  
**Quote number** : SY/139/19 B  
**No. of samples received** : 5  
**No. of samples analysed** : 5

**Page** : 1 of 6  
**Laboratory** : Environmental Division Perth  
**Contact** : [REDACTED]  
**Address** : 26 Rigali Way Wangara Western Australia Australia 6065  
**Telephone** : +6138549 9609  
**Date Samples Received** : 27-Jun-2022 11:40  
**Date Analysis Commenced** : 28-Jun-2022  
**Issue Date** : 08-Jul-2022 14:32



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                       |
|------------------------------------------------------------------------|----------------------------|----------------------------------------------|
| <span style="background-color: black; color: black;">[REDACTED]</span> | Laboratory Manager (Perth) | Perth Inorganics, Wangara, Western Australia |
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator           | Sydney Organics, Smithfield, NSW             |



## 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.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- 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.
- Ionic Balance out of acceptable limits for sample #1 and #2 due to analytes not quantified in this report.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                        |             |      |       | 0960_SW265_220622 | 0960_QC121_220622 | 0960_SW108_220622 | 0960_SW170_220622 | 0960_SW157_220622 |
|--------------------------------------------------------|-------------|------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                   |             |      |       | 22-Jun-2022 11:43 | 22-Jun-2022 11:43 | 22-Jun-2022 12:09 | 22-Jun-2022 12:22 | 22-Jun-2022 15:39 |
| Compound                                               | CAS Number  | LOR  | Unit  | EP2207728-001     | EP2207728-002     | EP2207728-003     | EP2207728-004     | EP2207728-005     |
|                                                        |             |      |       | Result            | Result            | Result            | Result            | Result            |
| <b>ED037P: Alkalinity by PC Titrator</b>               |             |      |       |                   |                   |                   |                   |                   |
| Hydroxide Alkalinity as CaCO3                          | DMO-210-001 | 1    | mg/L  | <1                | <1                | <1                | <1                | <1                |
| Carbonate Alkalinity as CaCO3                          | 3812-32-6   | 1    | mg/L  | <1                | <1                | <1                | <1                | 7                 |
| Bicarbonate Alkalinity as CaCO3                        | 71-52-3     | 1    | mg/L  | 103               | 92                | 90                | 82                | 56                |
| Total Alkalinity as CaCO3                              | ----        | 1    | mg/L  | 103               | 92                | 90                | 82                | 63                |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b> |             |      |       |                   |                   |                   |                   |                   |
| Sulfate as SO4 - Turbidimetric                         | 14808-79-8  | 1    | mg/L  | 30                | 27                | 5                 | 2                 | 18                |
| <b>ED045G: Chloride by Discrete Analyser</b>           |             |      |       |                   |                   |                   |                   |                   |
| Chloride                                               | 16887-00-6  | 1    | mg/L  | 240               | 237               | 8                 | 8                 | 203               |
| <b>ED093F: Dissolved Major Cations</b>                 |             |      |       |                   |                   |                   |                   |                   |
| Calcium                                                | 7440-70-2   | 1    | mg/L  | 17                | 18                | 22                | 22                | 18                |
| Magnesium                                              | 7439-95-4   | 1    | mg/L  | 12                | 12                | 3                 | 3                 | 8                 |
| Sodium                                                 | 7440-23-5   | 1    | mg/L  | 123               | 116               | 12                | 7                 | 99                |
| Potassium                                              | 7440-09-7   | 1    | mg/L  | 15                | 14                | 5                 | 3                 | 12                |
| <b>EN055: Ionic Balance</b>                            |             |      |       |                   |                   |                   |                   |                   |
| ∅ Total Anions                                         | ----        | 0.01 | meq/L | 9.45              | 9.08              | 2.13              | 1.90              | 7.36              |
| ∅ Total Cations                                        | ----        | 0.01 | meq/L | 7.57              | 7.29              | 1.99              | 1.72              | 6.17              |
| ∅ Ionic Balance                                        | ----        | 0.01 | %     | 11.1              | 11.0              | 3.24              | 4.95              | 8.80              |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>           |             |      |       |                   |                   |                   |                   |                   |
| 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  | 0.09              | 0.09              | 0.17              | 0.08              | 0.15              |
| Perfluorodecane sulfonic acid (PFDS)                   | 335-77-3    | 0.02 | µg/L  | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>         |             |      |       |                   |                   |                   |                   |                   |
| 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             |



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_SW265_220622 | 0960_QC121_220622 | 0960_SW108_220622 | 0960_SW170_220622 | 0960_SW157_220622 |
|------------------------------------------------------------|-------------|------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                       |             |      |      | 22-Jun-2022 11:43 | 22-Jun-2022 11:43 | 22-Jun-2022 12:09 | 22-Jun-2022 12:22 | 22-Jun-2022 15:39 |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2207728-001     | EP2207728-002     | EP2207728-003     | EP2207728-004     | EP2207728-005     |
|                                                            |             |      |      | Result            | Result            | Result            | Result            | Result            |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                   |                   |                   |                   |                   |
| 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             |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                   |                   |                   |                   |                   |
| Perfluorooctane sulfonamide (FOSA)                         | 754-91-6    | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)              | 31506-32-8  | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)               | 4151-50-2   | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)       | 24448-09-7  | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)        | 1691-99-2   | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)  | 2355-31-9   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)   | 2991-50-6   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                   |                   |                   |                   |                   |
| 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             |



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_SW265_220622 | 0960_QC121_220622 | 0960_SW108_220622 | 0960_SW170_220622 | 0960_SW157_220622 |
|---------------------------------------------------------------|--------------------|------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                          |                    |      |      | 22-Jun-2022 11:43 | 22-Jun-2022 11:43 | 22-Jun-2022 12:09 | 22-Jun-2022 12:22 | 22-Jun-2022 15:39 |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2207728-001     | EP2207728-002     | EP2207728-003     | EP2207728-004     | EP2207728-005     |
|                                                               |                    |      |      | Result            | Result            | Result            | Result            | Result            |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                   |                   |                   |                   |                   |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                   |                   |                   |                   |                   |
| Sum of PFAS                                                   | ----               | 0.01 | µg/L | 0.09              | 0.09              | 0.17              | 0.08              | 0.15              |
| Sum of PFHxS and PFOS                                         | 355-46-4/1763-23-1 | 0.01 | µg/L | 0.09              | 0.09              | 0.17              | 0.08              | 0.15              |
| Sum of PFAS (WA DER List)                                     | ----               | 0.01 | µg/L | 0.09              | 0.09              | 0.17              | 0.08              | 0.15              |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 88.6              | 110               | 100               | 104               | 102               |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 77.4              | 84.2              | 88.0              | 87.0              | 85.4              |

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Work Order : EP2207728  
Client : STANTEC AUSTRALIA PTY LTD  
Project : WA\_0960\_PFASOMP



## Surrogate Control Limits

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

## Inter-Laboratory Testing

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

|                                |                                                           |                                |                                                                 |
|--------------------------------|-----------------------------------------------------------|--------------------------------|-----------------------------------------------------------------|
| <b>Work Order</b>              | <b>: EP2207728</b>                                        | <b>Page</b>                    | <b>: 1 of 6</b>                                                 |
| <b>Client</b>                  | <b>: STANTEC AUSTRALIA PTY LTD</b>                        | <b>Laboratory</b>              | <b>: Environmental Division Perth</b>                           |
| <b>Contact</b>                 | <b>: [REDACTED]</b>                                       | <b>Contact</b>                 | <b>: [REDACTED]</b>                                             |
| <b>Address</b>                 | <b>: GROUND FLOOR 226 ADELAIDE TERRACE<br/>PERTH 6000</b> | <b>Address</b>                 | <b>: 26 Rigali Way Wangara Western Australia Australia 6065</b> |
| <b>Telephone</b>               | <b>: ----</b>                                             | <b>Telephone</b>               | <b>: +6138549 9609</b>                                          |
| <b>Project</b>                 | <b>: WA_0960_PFASOMP</b>                                  | <b>Date Samples Received</b>   | <b>: 27-Jun-2022</b>                                            |
| <b>Order number</b>            | <b>: pfas-omp Learmonth</b>                               | <b>Date Analysis Commenced</b> | <b>: 28-Jun-2022</b>                                            |
| <b>C-O-C number</b>            | <b>: 39223</b>                                            | <b>Issue Date</b>              | <b>: 08-Jul-2022</b>                                            |
| <b>Sampler</b>                 | <b>: [REDACTED]</b>                                       |                                |                                                                 |
| <b>Site</b>                    | <b>: Learmonth SW/OTH - [REDACTED]</b>                    |                                |                                                                 |
| <b>Quote number</b>            | <b>: SY/139/19 B</b>                                      |                                |                                                                 |
| <b>No. of samples received</b> | <b>: 5</b>                                                |                                |                                                                 |
| <b>No. of samples analysed</b> | <b>: 5</b>                                                |                                |                                                                 |



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

This Quality Control Report contains the following information:

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

### Signatories

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

| Signatories | Position                   | Accreditation Category                       |
|-------------|----------------------------|----------------------------------------------|
| [REDACTED]  | Laboratory Manager (Perth) | Perth Inorganics, Wangara, Western Australia |
| [REDACTED]  | LCMS Coordinator           | Sydney Organics, Smithfield, NSW             |



## 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**

| Sub-Matrix: WATER                                                 |                   |                                          |             | Laboratory Duplicate (DUP) Report |      |                 |                  |         |                    |
|-------------------------------------------------------------------|-------------------|------------------------------------------|-------------|-----------------------------------|------|-----------------|------------------|---------|--------------------|
| Laboratory sample ID                                              | Sample ID         | Method: Compound                         | CAS Number  | LOR                               | Unit | Original Result | Duplicate Result | RPD (%) | Acceptable RPD (%) |
| ED037P: Alkalinity by PC Titrator (QC Lot: 4445364)               |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207727-002                                                     | Anonymous         | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 835             | 846              | 1.3     | 0% - 20%           |
|                                                                   |                   | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 835             | 846              | 1.3     | 0% - 20%           |
| EP2207727-012                                                     | Anonymous         | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 275             | 288              | 4.7     | 0% - 20%           |
|                                                                   |                   | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 275             | 288              | 4.7     | 0% - 20%           |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4429755) |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207728-001                                                     | 0960_SW265_220622 | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 30              | 29               | 0.0     | 0% - 20%           |
| EP2207737-006                                                     | Anonymous         | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 1550            | 1560             | 0.8     | 0% - 20%           |
| ED045G: Chloride by Discrete Analyser (QC Lot: 4429754)           |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207728-001                                                     | 0960_SW265_220622 | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 240             | 243              | 1.2     | 0% - 20%           |
| EP2207737-006                                                     | Anonymous         | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 11900           | 12000            | 0.6     | 0% - 20%           |
| ED093F: Dissolved Major Cations (QC Lot: 4427080)                 |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207727-001                                                     | Anonymous         | ED093F: Calcium                          | 7440-70-2   | 1                                 | mg/L | 145             | 144              | 0.0     | 0% - 20%           |
|                                                                   |                   | ED093F: Magnesium                        | 7439-95-4   | 1                                 | mg/L | 268             | 269              | 0.0     | 0% - 20%           |
|                                                                   |                   | ED093F: Sodium                           | 7440-23-5   | 1                                 | mg/L | 2980            | 3010             | 1.2     | 0% - 20%           |
|                                                                   |                   | ED093F: Potassium                        | 7440-09-7   | 1                                 | mg/L | 132             | 133              | 1.3     | 0% - 20%           |
| EP2207727-011                                                     | Anonymous         | ED093F: Calcium                          | 7440-70-2   | 1                                 | mg/L | 742             | 738              | 0.6     | 0% - 20%           |
|                                                                   |                   | ED093F: Magnesium                        | 7439-95-4   | 1                                 | mg/L | 947             | 938              | 0.9     | 0% - 20%           |
|                                                                   |                   | ED093F: Sodium                           | 7440-23-5   | 1                                 | mg/L | 8290            | 8240             | 0.5     | 0% - 20%           |
|                                                                   |                   | ED093F: Potassium                        | 7440-09-7   | 1                                 | mg/L | 222             | 221              | 0.5     | 0% - 20%           |



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: 4438993)      |           |                                                                   |             |                                   |      |                 |                  |         |                    |
| EP2207737-010                                                | Anonymous | EP231X: Perfluorohexane sulfonic acid (PFHxS)                     | 355-46-4    | 0.01                              | µg/L | 1.49            | 1.48             | 1.2     | 0% - 20%           |
|                                                              |           | EP231X: Perfluorooctane sulfonic acid (PFOS)                      | 1763-23-1   | 0.01                              | µg/L | 0.70            | 0.67             | 4.2     | 0% - 20%           |
|                                                              |           | EP231X: Perfluorobutane sulfonic acid (PFBS)                      | 375-73-5    | 0.02                              | µg/L | 0.14            | 0.13             | 0.0     | No Limit           |
|                                                              |           | EP231X: Perfluoropentane sulfonic acid (PFPeS)                    | 2706-91-4   | 0.02                              | µg/L | 0.19            | 0.18             | 7.2     | No Limit           |
|                                                              |           | EP231X: Perfluoroheptane sulfonic acid (PFHpS)                    | 375-92-8    | 0.02                              | µg/L | 0.08            | 0.09             | 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: 4438993)    |           |                                                                   |             |                                   |      |                 |                  |         |                    |
| EP2207737-010                                                | Anonymous | 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 | 0.11            | 0.09             | 18.3    | No Limit           |
|                                                              |           | EP231X: Perfluorohexanoic acid (PFHxA)                            | 307-24-4    | 0.02                              | µg/L | 0.46            | 0.42             | 9.1     | 0% - 20%           |
|                                                              |           | EP231X: Perfluoroheptanoic acid (PFHpA)                           | 375-85-9    | 0.02                              | µg/L | 0.05            | 0.04             | 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: 4438993)        |           |                                                                   |             |                                   |      |                 |                  |         |                    |
| EP2207737-010                                                | Anonymous | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                              |           | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                              |           | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                              |           | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                              |           | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                              |           | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                              |           | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4438993) |           |                                                                   |             |                                   |      |                 |                  |         |                    |
| EP2207737-010                                                | Anonymous | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                              |           | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 27619-97-2  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                              |           | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | 39108-34-4  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |



| Sub-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: 4438993) - continued |           |                                                     |             |                                   |      |                 |                  |         |                    |
| EP2207737-010                                                            | Anonymous | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS) | 120226-60-0 | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
| EP231P: PFAS Sums (QC Lot: 4438993)                                      |           |                                                     |             |                                   |      |                 |                  |         |                    |
| EP2207737-010                                                            | Anonymous | EP231X: Sum of PFAS                                 | ----        | 0.01                              | µg/L | 3.28            | 3.16             | 3.7     | 0% - 20%           |



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

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

Sub-Matrix: **WATER**

| Sub-Matrix: WATER                                                |             |      |      | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                    |                       |      |
|------------------------------------------------------------------|-------------|------|------|-----------------------------|---------------------------------------|--------------------|-----------------------|------|
|                                                                  |             |      |      |                             | Spike<br>Concentration                | Spike Recovery (%) | Acceptable Limits (%) |      |
| Method: Compound                                                 | CAS Number  | LOR  | Unit | Result                      |                                       |                    | LCS                   | Low  |
| ED037P: Alkalinity by PC Titrator (QCLot: 4445364)               |             |      |      |                             |                                       |                    |                       |      |
| ED037-P: Hydroxide Alkalinity as CaCO3                           | DMO-210-001 | 1    | mg/L | <1                          | ----                                  | ----               | ----                  | ---- |
| ED037-P: Carbonate Alkalinity as CaCO3                           | 3812-32-6   | 1    | mg/L | <1                          | ----                                  | ----               | ----                  | ---- |
| ED037-P: Bicarbonate Alkalinity as CaCO3                         | 71-52-3     | 1    | mg/L | <1                          | ----                                  | ----               | ----                  | ---- |
| ED037-P: Total Alkalinity as CaCO3                               | ----        | 1    | mg/L | <1                          | 20 mg/L                               | 105                | 87.8                  | 118  |
|                                                                  |             |      |      | <1                          | 200 mg/L                              | 97.1               | 87.8                  | 118  |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4429755) |             |      |      |                             |                                       |                    |                       |      |
| ED041G: Sulfate as SO4 - Turbidimetric                           | 14808-79-8  | 1    | mg/L | <1                          | 25 mg/L                               | 102                | 89.9                  | 112  |
|                                                                  |             |      |      | <1                          | 500 mg/L                              | 103                | 89.9                  | 112  |
| ED045G: Chloride by Discrete Analyser (QCLot: 4429754)           |             |      |      |                             |                                       |                    |                       |      |
| ED045G: Chloride                                                 | 16887-00-6  | 1    | mg/L | <1                          | 10 mg/L                               | 108                | 88.6                  | 113  |
|                                                                  |             |      |      | <1                          | 1000 mg/L                             | 100                | 88.6                  | 113  |
| ED093F: Dissolved Major Cations (QCLot: 4427080)                 |             |      |      |                             |                                       |                    |                       |      |
| ED093F: Calcium                                                  | 7440-70-2   | 1    | mg/L | <1                          | 50 mg/L                               | 90.7               | 86.5                  | 117  |
| ED093F: Magnesium                                                | 7439-95-4   | 1    | mg/L | <1                          | 50 mg/L                               | 93.2               | 88.4                  | 110  |
| ED093F: Sodium                                                   | 7440-23-5   | 1    | mg/L | <1                          | 50 mg/L                               | 105                | 91.4                  | 113  |
| ED093F: Potassium                                                | 7440-09-7   | 1    | mg/L | <1                          | 50 mg/L                               | 94.6               | 84.6                  | 108  |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4438993)           |             |      |      |                             |                                       |                    |                       |      |
| EP231X: Perfluorobutane sulfonic acid (PFBS)                     | 375-73-5    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 100                | 72.0                  | 130  |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)                   | 2706-91-4   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 92.0               | 71.0                  | 127  |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)                    | 355-46-4    | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 98.0               | 68.0                  | 131  |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)                   | 375-92-8    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 100                | 69.0                  | 134  |
| EP231X: Perfluorooctane sulfonic acid (PFOS)                     | 1763-23-1   | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 84.0               | 65.0                  | 140  |
| EP231X: Perfluorodecane sulfonic acid (PFDS)                     | 335-77-3    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 88.0               | 53.0                  | 142  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4438993)         |             |      |      |                             |                                       |                    |                       |      |
| EP231X: Perfluorobutanoic acid (PFBA)                            | 375-22-4    | 0.1  | µg/L | <0.1                        | 1.25 µg/L                             | 94.8               | 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                             | 112                | 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                             | 108                | 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                             | 122                | 71.0                  | 129  |
| EP231X: Perfluoroundecanoic acid (PFUnDA)                        | 2058-94-8   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 90.0               | 69.0                  | 133  |
| EP231X: Perfluorododecanoic acid (PFDoDA)                        | 307-55-1    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 104                | 72.0                  | 134  |



Sub-Matrix: **WATER**

| Method: Compound                                                            |             |      |      | Method Blank (MB)<br>Report<br>Result | Laboratory Control Spike (LCS) Report |                    |                       |      |
|-----------------------------------------------------------------------------|-------------|------|------|---------------------------------------|---------------------------------------|--------------------|-----------------------|------|
|                                                                             |             |      |      |                                       | Spike<br>Concentration                | Spike Recovery (%) | Acceptable Limits (%) |      |
|                                                                             |             |      |      |                                       |                                       | LCS                | Low                   | High |
| CAS Number                                                                  | LOR         | Unit |      |                                       |                                       |                    |                       |      |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4438993) - continued</b> |             |      |      |                                       |                                       |                    |                       |      |
| 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                            | 87.2               | 71.0                  | 132  |
| <b>EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4438993)</b>                 |             |      |      |                                       |                                       |                    |                       |      |
| EP231X: Perfluorooctane sulfonamide (FOSA)                                  | 754-91-6    | 0.02 | µg/L | <0.02                                 | 0.25 µg/L                             | 116                | 67.0                  | 137  |
| EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)                       | 31506-32-8  | 0.05 | µg/L | <0.05                                 | 0.625 µg/L                            | 98.4               | 68.0                  | 141  |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)                        | 4151-50-2   | 0.05 | µg/L | <0.05                                 | 0.625 µg/L                            | 98.4               | 62.6                  | 147  |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)                | 24448-09-7  | 0.05 | µg/L | <0.05                                 | 0.625 µg/L                            | 119                | 66.0                  | 145  |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)                 | 1691-99-2   | 0.05 | µg/L | <0.05                                 | 0.625 µg/L                            | 79.2               | 57.6                  | 145  |
| EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)           | 2355-31-9   | 0.02 | µg/L | <0.02                                 | 0.25 µg/L                             | 108                | 65.0                  | 136  |
| EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)            | 2991-50-6   | 0.02 | µg/L | <0.02                                 | 0.25 µg/L                             | 100                | 61.0                  | 135  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4438993)</b>          |             |      |      |                                       |                                       |                    |                       |      |
| EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                           | 757124-72-4 | 0.05 | µg/L | <0.05                                 | 0.25 µg/L                             | 100                | 63.0                  | 143  |
| EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                           | 27619-97-2  | 0.05 | µg/L | <0.05                                 | 0.25 µg/L                             | 120                | 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                             | 104                | 67.0                  | 138  |
| EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)                         | 120226-60-0 | 0.05 | µg/L | <0.05                                 | 0.25 µg/L                             | 98.0               | 71.4                  | 144  |

## 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                                                    |                   |                                        |            | Matrix Spike (MS) Report |                  |                       |      |
|-------------------------------------------------------------------------|-------------------|----------------------------------------|------------|--------------------------|------------------|-----------------------|------|
|                                                                         |                   |                                        |            | Spike<br>Concentration   | SpikeRecovery(%) | Acceptable Limits (%) |      |
|                                                                         |                   |                                        |            |                          | MS               | Low                   | High |
| Sample ID                                                               | Method: Compound  | CAS Number                             |            |                          |                  |                       |      |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4429755)</b> |                   |                                        |            |                          |                  |                       |      |
| EP2207728-001                                                           | 0960_SW265_220622 | ED041G: Sulfate as SO4 - Turbidimetric | 14808-79-8 | 100 mg/L                 | 93.7             | 70.4                  | 130  |
| <b>ED045G: Chloride by Discrete Analyser (QCLot: 4429754)</b>           |                   |                                        |            |                          |                  |                       |      |
| EP2207728-001                                                           | 0960_SW265_220622 | ED045G: Chloride                       | 16887-00-6 | 1000 mg/L                | 93.8             | 70.0                  | 130  |

## QA/QC Compliance Assessment to assist with Quality Review

|              |                                 |                         |                                |
|--------------|---------------------------------|-------------------------|--------------------------------|
| Work Order   | : EP2207728                     | Page                    | : 1 of 5                       |
| Client       | : STANTEC AUSTRALIA PTY LTD     | Laboratory              | : Environmental Division Perth |
| Contact      | : [REDACTED]                    | Telephone               | : +6138549 9609                |
| Project      | : WA_0960_PFASOMP               | Date Samples Received   | : 27-Jun-2022                  |
| Site         | : Learmonth SW/OTH - [REDACTED] | Issue Date              | : 08-Jul-2022                  |
| Sampler      | : [REDACTED]                    | No. of samples received | : 5                            |
| Order number | : pfas-omp Learmonth            | 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

- 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 : Analysis Holding Time Compliance

Matrix: **WATER**

| Method                                                  | Extraction / Preparation              |                    |              | Analysis      |                         |              |
|---------------------------------------------------------|---------------------------------------|--------------------|--------------|---------------|-------------------------|--------------|
|                                                         | Date extracted                        | Due for extraction | Days overdue | Date analysed | Due for analysis        | Days overdue |
| <b>ED037P: Alkalinity by PC Titrator</b>                |                                       |                    |              |               |                         |              |
| <b>Clear Plastic Bottle - Natural</b>                   |                                       |                    |              |               |                         |              |
| 0960_SW265_220622, 0960_SW108_220622, 0960_SW157_220622 | 0960_QC121_220622, 0960_SW170_220622, | ----               | ----         | ----          | 07-Jul-2022 06-Jul-2022 | 1            |

### Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

| Quality Control Sample Type<br>Method                | Count |         | Rate (%) |          | Quality Control Specification  |
|------------------------------------------------------|-------|---------|----------|----------|--------------------------------|
|                                                      | QC    | Regular | Actual   | Expected |                                |
| Laboratory Duplicates (DUP)                          |       |         |          |          |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | 1     | 20      | 5.00     | 10.00    | NEPM 2013 B3 & ALS QC Standard |
| Matrix Spikes (MS)                                   |       |         |          |          |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | 0     | 20      | 0.00     | 5.00     | NEPM 2013 B3 & ALS QC Standard |

### Analysis Holding Time Compliance

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

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

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

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

Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                                  | Sample Date                           | Extraction / Preparation |                    |            | Analysis      |                         |            |
|---------------------------------------------------------|---------------------------------------|--------------------------|--------------------|------------|---------------|-------------------------|------------|
| Container / Client Sample ID(s)                         |                                       | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis        | Evaluation |
| ED037P: Alkalinity by PC Titrator                       |                                       |                          |                    |            |               |                         |            |
| Clear Plastic Bottle - Natural (ED037-P)                |                                       |                          |                    |            |               |                         |            |
| 0960_SW265_220622, 0960_SW108_220622, 0960_SW157_220622 | 0960_QC121_220622, 0960_SW170_220622, | 22-Jun-2022              | ----               | ----       | ----          | 07-Jul-2022 06-Jul-2022 | ✖          |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA         |                                       |                          |                    |            |               |                         |            |
| Clear Plastic Bottle - Natural (ED041G)                 |                                       |                          |                    |            |               |                         |            |
| 0960_SW265_220622, 0960_SW108_220622, 0960_SW157_220622 | 0960_QC121_220622, 0960_SW170_220622, | 22-Jun-2022              | ----               | ----       | ----          | 08-Jul-2022 20-Jul-2022 | ✔          |



Matrix: **WATER**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

| Method                                     |                    | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |
|--------------------------------------------|--------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|
| Container / Client Sample ID(s)            |                    |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| ED045G: Chloride by Discrete Analyser      |                    |             |                          |                    |            |               |                  |            |
| Clear Plastic Bottle - Natural (ED045G)    |                    |             |                          |                    |            |               |                  |            |
| 0960_SW265_220622,                         | 0960_QC121_220622, | 22-Jun-2022 | ----                     | ----               | ----       | 08-Jul-2022   | 20-Jul-2022      | ✓          |
| 0960_SW108_220622,                         | 0960_SW170_220622, |             |                          |                    |            |               |                  |            |
| 0960_SW157_220622                          |                    |             |                          |                    |            |               |                  |            |
| ED093F: Dissolved Major Cations            |                    |             |                          |                    |            |               |                  |            |
| Clear Plastic Bottle - Natural (ED093F)    |                    |             |                          |                    |            |               |                  |            |
| 0960_SW265_220622,                         | 0960_QC121_220622, | 22-Jun-2022 | ----                     | ----               | ----       | 28-Jun-2022   | 29-Jun-2022      | ✓          |
| 0960_SW108_220622,                         | 0960_SW170_220622, |             |                          |                    |            |               |                  |            |
| 0960_SW157_220622                          |                    |             |                          |                    |            |               |                  |            |
| EP231A: Perfluoroalkyl Sulfonic Acids      |                    |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                    |                    |             |                          |                    |            |               |                  |            |
| 0960_SW265_220622,                         | 0960_QC121_220622, | 22-Jun-2022 | 05-Jul-2022              | 19-Dec-2022        | ✓          | 06-Jul-2022   | 19-Dec-2022      | ✓          |
| 0960_SW108_220622,                         | 0960_SW170_220622, |             |                          |                    |            |               |                  |            |
| 0960_SW157_220622                          |                    |             |                          |                    |            |               |                  |            |
| EP231B: Perfluoroalkyl Carboxylic Acids    |                    |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                    |                    |             |                          |                    |            |               |                  |            |
| 0960_SW265_220622,                         | 0960_QC121_220622, | 22-Jun-2022 | 05-Jul-2022              | 19-Dec-2022        | ✓          | 06-Jul-2022   | 19-Dec-2022      | ✓          |
| 0960_SW108_220622,                         | 0960_SW170_220622, |             |                          |                    |            |               |                  |            |
| 0960_SW157_220622                          |                    |             |                          |                    |            |               |                  |            |
| EP231C: Perfluoroalkyl Sulfonamides        |                    |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                    |                    |             |                          |                    |            |               |                  |            |
| 0960_SW265_220622,                         | 0960_QC121_220622, | 22-Jun-2022 | 05-Jul-2022              | 19-Dec-2022        | ✓          | 06-Jul-2022   | 19-Dec-2022      | ✓          |
| 0960_SW108_220622,                         | 0960_SW170_220622, |             |                          |                    |            |               |                  |            |
| 0960_SW157_220622                          |                    |             |                          |                    |            |               |                  |            |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids |                    |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                    |                    |             |                          |                    |            |               |                  |            |
| 0960_SW265_220622,                         | 0960_QC121_220622, | 22-Jun-2022 | 05-Jul-2022              | 19-Dec-2022        | ✓          | 06-Jul-2022   | 19-Dec-2022      | ✓          |
| 0960_SW108_220622,                         | 0960_SW170_220622, |             |                          |                    |            |               |                  |            |
| 0960_SW157_220622                          |                    |             |                          |                    |            |               |                  |            |
| EP231P: PFAS Sums                          |                    |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                    |                    |             |                          |                    |            |               |                  |            |
| 0960_SW265_220622,                         | 0960_QC121_220622, | 22-Jun-2022 | 05-Jul-2022              | 19-Dec-2022        | ✓          | 06-Jul-2022   | 19-Dec-2022      | ✓          |
| 0960_SW108_220622,                         | 0960_SW170_220622, |             |                          |                    |            |               |                  |            |
| 0960_SW157_220622                          |                    |             |                          |                    |            |               |                  |            |



## Quality Control Parameter Frequency Compliance

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

Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

| Quality Control Sample Type                            |         | Count |         | Rate (%) |          |            | Quality Control Specification  |
|--------------------------------------------------------|---------|-------|---------|----------|----------|------------|--------------------------------|
| Analytical Methods                                     | Method  | QC    | Regular | Actual   | Expected | Evaluation |                                |
|                                                        |         |       |         |          |          |            |                                |
| Laboratory Duplicates (DUP)                            |         |       |         |          |          |            |                                |
| Alkalinity by Auto Titrator                            | ED037-P | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 20      | 5.00     | 10.00    | ✗          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Laboratory Control Samples (LCS)                       |         |       |         |          |          |            |                                |
| Alkalinity by Auto Titrator                            | ED037-P | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Method Blanks (MB)                                     |         |       |         |          |          |            |                                |
| Alkalinity by Auto Titrator                            | ED037-P | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Matrix Spikes (MS)                                     |         |       |         |          |          |            |                                |
| Chloride by Discrete Analyser                          | ED045G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 0     | 20      | 0.00     | 5.00     | ✗          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |



## Brief Method Summaries

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

| Analytical Methods                                                 | Method       | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------------------|--------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alkalinity by Auto Titrator                                        | ED037-P      | WATER  | In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                                                                                                                                                                                                                |
| Sulfate (Turbidimetric) as SO <sub>4</sub> 2- by Discrete Analyser | ED041G       | WATER  | In house: Referenced to APHA 4500-SO <sub>4</sub> . Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO <sub>4</sub> suspension is measured by a photometer and the SO <sub>4</sub> -2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                         |
| Chloride by Discrete Analyser                                      | ED045G       | WATER  | In house: Referenced to APHA 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm.                                                                                                                                                                                                                                                                                                                                                                |
| Major Cations - Dissolved                                          | ED093F       | WATER  | In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                           |
| Ionic Balance by PCT DA and Turbi SO <sub>4</sub> DA               | * EN055 - PG | WATER  | In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS               | EP231X       | WATER  | In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements. |
| Preparation Methods                                                | Method       | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Solid Phase Extraction (SPE) for PFAS in water                     | ORG72        | WATER  | In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.                                                                                                                                                                                                |



# CHAIN OF CUSTODY

COC#: 39224

ALS Laboratory: EP Perth

CLIENT: MWH AUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: Learmonth SD - MB

ORDER NO: pfas-omp Learmonth

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:

## SAMPLE DETAILS

## ANALYSIS REQUIRED

| SAMPLE | NAME       | DESCRIPTION | DATE / TIME         | MATRIX | TOTAL BOTTLES        | ON HOLD | PFAS Sediments SEDIMENT | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|------------|-------------|---------------------|--------|----------------------|---------|-------------------------|----------------------|------------------------|
| 001    | 0960_SS234 |             | 22/06/2022 09:07 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |
| 002    | 0960_SS235 |             | 22/06/2022 09:07 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |
| 003    | 0960_SD219 |             | 22/06/2022 10:10 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |
| 004    | 0960_SS114 |             | 22/06/2022 10:49 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |
| 005    | 0960_SS231 |             | 22/06/2022 11:21 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |
| 006    | 0960_SS265 |             | 22/06/2022 11:31 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |
| 007    | 0960_SS108 |             | 22/06/2022 12:02 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |
| 008    | 0960_SS170 |             | 22/06/2022 12:17 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |
| 009    | 0960_SS176 |             | 22/06/2022 01:32 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |



# CHAIN OF CUSTODY

COC#: 39224 ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: Learmonth SD - MB

ORDER NO: pfas-on-

PROJECT MANAGE

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:

## SAMPLE DETAILS

## ANALYSIS REQUIRED

| SAMPLE | NAME       | DESCRIPTION | DATE / TIME         | MATRIX | TOTAL BOTTLES        | ON HOLD | PFAS Sediments SEDIMENT | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|------------|-------------|---------------------|--------|----------------------|---------|-------------------------|----------------------|------------------------|
| 010    | 0960_SS279 |             | 22/06/2022 01:44 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |
| 011    | 0960_SS168 |             | 22/06/2022 01:51 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |
| 012    | 0960_SS166 |             | 22/06/2022 01:54 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |
| 013    | 0960_SS243 |             | 22/06/2022 02:25 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |
| 014    | 0960_SS174 |             | 22/06/2022 02:29 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |
| 015    | 0960_SS277 |             | 22/06/2022 02:34 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |
| 016    | 0960_SS124 |             | 22/06/2022 02:35 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |
| 017    | 0960_SS125 |             | 22/06/2022 02:42 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |
| 018    | 0960_SS113 |             | 22/06/2022 03:51 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |



# CHAIN OF CUSTODY

COC#: 39224

ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: Learmonth SD - MB

ORDER NO: pfas-omp Learmonth

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:

## SAMPLE DETAILS

## ANALYSIS REQUIRED

| SAMPLE | NAME       | DESCRIPTION | DATE / TIME            | MATRIX | TOTAL BOTTLES        | ON HOLD | PFAS Sediments SEDIMENT | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|------------|-------------|------------------------|--------|----------------------|---------|-------------------------|----------------------|------------------------|
| 019    | 0960_SS278 |             | 22/06/2022<br>03:54 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |
| 020    | 0960_QC125 |             | 22/06/2022<br>03:55 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |





# CHAIN OF CUSTODY

COC#: 39224

ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: Learmonth SD - MB

ORDER NO: pfas-omp Learmonth

PROJECT MANAGER

PRIMARY SAMPLE

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:

| SAMPLE | SAMPLE NAME | BOTTLE NAME   | VOLUME | BARCODE        | TYPE | FILTERED | REASON |
|--------|-------------|---------------|--------|----------------|------|----------|--------|
| 001    | 0960_SS234  | HDPE Soil Jar | 200 mL | 00620322036412 | Grey | No       |        |
| 002    | 0960_SS235  | HDPE Soil Jar | 200 mL | 00620322036380 | Grey | No       |        |
| 003    | 0960_SD219  | HDPE Soil Jar | 200 mL | 00620322036410 | Grey | No       |        |
| 004    | 0960_SS114  | HDPE Soil Jar | 200 mL | 00620322036386 | Grey | No       |        |
| 005    | 0960_SS231  | HDPE Soil Jar | 200 mL | 00620322036373 | Grey | No       |        |
| 006    | 0960_SS265  | HDPE Soil Jar | 200 mL | 00620322036408 | Grey | No       |        |
| 007    | 0960_SS108  | HDPE Soil Jar | 200 mL | 00620322036407 | Grey | No       |        |
| 008    | 0960_SS170  | HDPE Soil Jar | 200 mL | 00620322036397 | Grey | No       |        |
| 009    | 0960_SS176  | HDPE Soil Jar | 200 mL | 00620322036387 | Grey | No       |        |
| 010    | 0960_SS279  | HDPE Soil Jar | 200 mL | 00620322036385 | Grey | No       |        |
| 011    | 0960_SS168  | HDPE Soil Jar | 200 mL | 00620322036428 | Grey | No       |        |
| 012    | 0960_SS166  | HDPE Soil Jar | 200 mL | 00620322036379 | Grey | No       |        |
| 013    | 0960_SS243  | HDPE Soil Jar | 200 mL | 00620322036343 | Grey | No       |        |
| 014    | 0960_SS174  | HDPE Soil Jar | 200 mL | 00620322036419 | Grey | No       |        |
| 015    | 0960_SS277  | HDPE Soil Jar | 200 mL | 00620322036368 | Grey | No       |        |
| 016    | 0960_SS124  | HDPE Soil Jar | 200 mL | 00620322036389 | Grey | No       |        |
| 017    | 0960_SS125  | HDPE Soil Jar | 200 mL | 00620322036341 | Grey | No       |        |
| 018    | 0960_SS113  | HDPE Soil Jar | 200 mL | 00620322036367 | Grey | No       |        |
| 019    | 0960_SS278  | HDPE Soil Jar | 200 mL | 00620322036370 | Grey | No       |        |
| 020    | 0960_QC125  | HDPE Soil Jar | 200 mL | 00620322036369 | Grey | No       |        |

Total Bottle Count: ALS: 20, Non ALS: 0

**SAMPLE RECEIPT NOTIFICATION (SRN)****Work Order : EP2207729**

Client : **STANTEC AUSTRALIA PTY LTD**  
Contact : [REDACTED]  
Address : GROUND FLOOR 226 ADELAIDE  
TERRACE  
PERTH 6000

Laboratory : Environmental Division Perth  
Contact : [REDACTED]  
Address : 26 Rigali Way Wangara Western  
Australia Australia 6065

E-mail : [REDACTED]@stantec.com  
Telephone : ----  
Facsimile : ----

E-mail : [REDACTED]@alsglobal.com  
Telephone : +6138549 9609  
Facsimile : +61-8-9406 1399

Project : WA\_0960\_PFASOMP  
Order number : pfas-omp Learmonth  
C-O-C number : 39224  
Site : Learmonth SD - [REDACTED]  
Sampler : [REDACTED]

Page : 1 of 3  
Quote number : ES2022MWHAUS0002 (SY/139/19 B)  
QC Level : NEPM 2013 B3 & ALS QC Standard

**Dates**

Date Samples Received : 27-Jun-2022 11:40  
Client Requested Due : 08-Jul-2022  
Date

Issue Date : 28-Jun-2022  
Scheduled Reporting Date : **08-Jul-2022**

**Delivery Details**

Mode of Delivery : Carrier  
No. of coolers/boxes : 5  
Receipt Detail :

Security Seal : Not Available  
Temperature : 13.4 - Ice present  
No. of samples received / analysed : 21 / 21

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



## Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exists.

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: SOIL

| Laboratory sample ID | Sampling date / time | Sample ID         | SOIL - EA055-103 Moisture Content | SOIL - EP231X (solids) PFAS - Full Suite (28 analytes) |
|----------------------|----------------------|-------------------|-----------------------------------|--------------------------------------------------------|
| EP2207729-001        | 22-Jun-2022 09:07    | 0960_SS234_220622 | ✓                                 | ✓                                                      |
| EP2207729-002        | 22-Jun-2022 09:07    | 0960_SS235_220622 | ✓                                 | ✓                                                      |
| EP2207729-003        | 22-Jun-2022 10:10    | 0960_SD219_220622 | ✓                                 | ✓                                                      |
| EP2207729-004        | 22-Jun-2022 10:49    | 0960_SS114_220622 | ✓                                 | ✓                                                      |
| EP2207729-005        | 22-Jun-2022 11:21    | 0960_SS231_220622 | ✓                                 | ✓                                                      |
| EP2207729-006        | 22-Jun-2022 11:31    | 0960_SS265_220622 | ✓                                 | ✓                                                      |
| EP2207729-007        | 22-Jun-2022 12:02    | 0960_SS108_220622 | ✓                                 | ✓                                                      |
| EP2207729-008        | 22-Jun-2022 12:17    | 0960_SS170_220622 | ✓                                 | ✓                                                      |
| EP2207729-009        | 22-Jun-2022 13:32    | 0960_SS176_220622 | ✓                                 | ✓                                                      |
| EP2207729-010        | 22-Jun-2022 13:44    | 0960_SS279_220622 | ✓                                 | ✓                                                      |
| EP2207729-011        | 22-Jun-2022 13:51    | 0960_SS168_220622 | ✓                                 | ✓                                                      |
| EP2207729-012        | 22-Jun-2022 13:54    | 0960_SS166_220622 | ✓                                 | ✓                                                      |
| EP2207729-013        | 22-Jun-2022 14:25    | 0960_SS243_220622 | ✓                                 | ✓                                                      |
| EP2207729-014        | 22-Jun-2022 14:29    | 0960_SS174_220622 | ✓                                 | ✓                                                      |
| EP2207729-015        | 22-Jun-2022 14:34    | 0960_SS277_220622 | ✓                                 | ✓                                                      |
| EP2207729-016        | 22-Jun-2022 14:35    | 0960_SS124_220622 | ✓                                 | ✓                                                      |
| EP2207729-017        | 22-Jun-2022 14:42    | 0960_SS125_220622 | ✓                                 | ✓                                                      |
| EP2207729-018        | 22-Jun-2022 15:51    | 0960_SS113_220622 | ✓                                 | ✓                                                      |
| EP2207729-019        | 22-Jun-2022 15:54    | 0960_SS278_220622 | ✓                                 | ✓                                                      |
| EP2207729-020        | 22-Jun-2022 15:55    | 0960_QC125_220622 | ✓                                 | ✓                                                      |
| EP2207729-021        | 22-Jun-2022 00:00    | 0960_SS157_220622 | ✓                                 | ✓                                                      |

## Proactive Holding Time Report

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

[REDACTED] [REDACTED]

- Email [REDACTED]cardno.com.au

- EDI Format - ESDAT (ESDAT)

- EDI Format - ESDAT (ESDAT)

Email [derp.labreports@esdat.com.au](mailto:derp.labreports@esdat.com.au)

- [illegible]

## CERTIFICATE OF ANALYSIS

**Work Order** : **EP2207729**  
**Client** : **STANTEC AUSTRALIA PTY LTD**  
**Contact** : [REDACTED]  
**Address** : GROUND FLOOR 226 ADELAIDE TERRACE  
 PERTH 6000  
**Telephone** : ----  
**Project** : WA\_0960\_PFASOMP  
**Order number** : pfas-omp Learmonth  
**C-O-C number** : 39224  
**Sampler** : [REDACTED]  
**Site** : Learmonth SD - [REDACTED]  
**Quote number** : SY/139/19 B  
**No. of samples received** : 21  
**No. of samples analysed** : 21

**Page** : 1 of 13  
**Laboratory** : Environmental Division Perth  
**Contact** : [REDACTED]  
**Address** : 26 Rigali Way Wangara Western Australia Australia 6065  
**Telephone** : +6138549 9609  
**Date Samples Received** : 27-Jun-2022 11:40  
**Date Analysis Commenced** : 04-Jul-2022  
**Issue Date** : 08-Jul-2022 11:15



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>      |
|------------------------------------------------------------------------|------------------|------------------------------------|
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator | Sydney Inorganics, Smithfield, NSW |
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator | Sydney Organics, Smithfield, NSW   |



## 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.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- 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

|                                                    |            |        |       | 0960_SS234_220622 | 0960_SS235_220622 | 0960_SD219_220622 | 0960_SS114_220622 | 0960_SS231_220622 |
|----------------------------------------------------|------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                               |            |        |       | 22-Jun-2022 09:07 | 22-Jun-2022 09:07 | 22-Jun-2022 10:10 | 22-Jun-2022 10:49 | 22-Jun-2022 11:21 |
| Compound                                           | CAS Number | LOR    | Unit  | EP2207729-001     | EP2207729-002     | EP2207729-003     | EP2207729-004     | EP2207729-005     |
|                                                    |            |        |       | Result            | Result            | Result            | Result            | Result            |
| <b>EA055: Moisture Content (Dried @ 105-110°C)</b> |            |        |       |                   |                   |                   |                   |                   |
| Moisture Content                                   | ----       | 0.1    | %     | 18.3              | 10.8              | 16.2              | 15.3              | 4.5               |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>       |            |        |       |                   |                   |                   |                   |                   |
| 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 | 0.0012            | <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 | 0.0333            | 0.0184            | 0.0086            | 0.0265            | 0.0044            |
| Perfluorodecane sulfonic acid (PFDS)               | 335-77-3   | 0.0002 | mg/kg | <0.0002           | <0.0002           | 0.0007            | 0.0021            | <0.0002           |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>     |            |        |       |                   |                   |                   |                   |                   |
| 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 | 0.0003            | <0.0002           | <0.0002           | <0.0002           | <0.0002           |
| Perfluorononanoic acid (PFNA)                      | 375-95-1   | 0.0002 | mg/kg | 0.0004            | 0.0002            | <0.0002           | <0.0002           | <0.0002           |
| Perfluorodecanoic acid (PFDA)                      | 335-76-2   | 0.0002 | mg/kg | 0.0004            | 0.0004            | 0.0003            | 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 (PFTriDA)                | 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           |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>         |            |        |       |                   |                   |                   |                   |                   |
| 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<br>(Matrix: SOIL)                    |                    |        |       | Sample ID | 0960_SS234_220622 | 0960_SS235_220622 | 0960_SD219_220622 | 0960_SS114_220622 | 0960_SS231_220622 |
|-----------------------------------------------------------|--------------------|--------|-------|-----------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                      |                    |        |       |           | 22-Jun-2022 09:07 | 22-Jun-2022 09:07 | 22-Jun-2022 10:10 | 22-Jun-2022 10:49 | 22-Jun-2022 11:21 |
| Compound                                                  | CAS Number         | LOR    | Unit  |           | EP2207729-001     | EP2207729-002     | EP2207729-003     | EP2207729-004     | EP2207729-005     |
|                                                           |                    |        |       | Result    | Result            | Result            | Result            | Result            | Result            |
| <b>EP231C: Perfluoroalkyl Sulfonamides - Continued</b>    |                    |        |       |           |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>         |                    |        |       |           |                   |                   |                   |                   |                   |
| 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   | 0.0014            | <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           |
| <b>EP231P: PFAS Sums</b>                                  |                    |        |       |           |                   |                   |                   |                   |                   |
| Sum of PFAS                                               | ----               | 0.0002 | mg/kg | 0.0358    | 0.0204            | 0.0096            | 0.0288            | 0.0044            |                   |
| Sum of PFHxS and PFOS                                     | 355-46-4/1763-23-1 | 0.0002 | mg/kg | 0.0345    | 0.0184            | 0.0086            | 0.0265            | 0.0044            |                   |
| Sum of PFAS (WA DER List)                                 | ----               | 0.0002 | mg/kg | 0.0350    | 0.0198            | 0.0086            | 0.0265            | 0.0044            |                   |
| <b>EP231S: PFAS Surrogate</b>                             |                    |        |       |           |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                 | ----               | 0.0002 | %     | 104       | 97.5              | 100               | 86.0              | 89.0              |                   |
| 13C8-PFOA                                                 | ----               | 0.0002 | %     | 112       | 98.0              | 97.5              | 99.5              | 95.0              |                   |



## Analytical Results

Sub-Matrix: SEDIMENT  
 (Matrix: SOIL)

Sample ID

|                                                    |            |        |       | 0960_SS265_220622 | 0960_SS108_220622 | 0960_SS170_220622 | 0960_SS176_220622 | 0960_SS279_220622 |
|----------------------------------------------------|------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                               |            |        |       | 22-Jun-2022 11:31 | 22-Jun-2022 12:02 | 22-Jun-2022 12:17 | 22-Jun-2022 13:32 | 22-Jun-2022 13:44 |
| Compound                                           | CAS Number | LOR    | Unit  | EP2207729-006     | EP2207729-007     | EP2207729-008     | EP2207729-009     | EP2207729-010     |
|                                                    |            |        |       | Result            | Result            | Result            | Result            | Result            |
| <b>EA055: Moisture Content (Dried @ 105-110°C)</b> |            |        |       |                   |                   |                   |                   |                   |
| Moisture Content                                   | ----       | 0.1    | %     | 29.4              | 21.3              | 52.9              | 7.7               | 20.4              |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>       |            |        |       |                   |                   |                   |                   |                   |
| 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 | 0.0012            | 0.0207            | 0.0055            | 0.0005            | 0.0063            |
| Perfluorodecane sulfonic acid (PFDS)               | 335-77-3   | 0.0002 | mg/kg | <0.0002           | <0.0002           | 0.0007            | <0.0002           | <0.0002           |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>     |            |        |       |                   |                   |                   |                   |                   |
| 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 (PFTeDA)                 | 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           |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>         |            |        |       |                   |                   |                   |                   |                   |
| 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

|                                                           |                    |        |       | 0960_SS265_220622 | 0960_SS108_220622 | 0960_SS170_220622 | 0960_SS176_220622 | 0960_SS279_220622 |
|-----------------------------------------------------------|--------------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                      |                    |        |       | 22-Jun-2022 11:31 | 22-Jun-2022 12:02 | 22-Jun-2022 12:17 | 22-Jun-2022 13:32 | 22-Jun-2022 13:44 |
| Compound                                                  | CAS Number         | LOR    | Unit  | EP2207729-006     | EP2207729-007     | EP2207729-008     | EP2207729-009     | EP2207729-010     |
|                                                           |                    |        |       | Result            | Result            | Result            | Result            | Result            |
| <b>EP231C: Perfluoroalkyl Sulfonamides - Continued</b>    |                    |        |       |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>         |                    |        |       |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231P: PFAS Sums</b>                                  |                    |        |       |                   |                   |                   |                   |                   |
| Sum of PFAS                                               | ----               | 0.0002 | mg/kg | 0.0012            | 0.0207            | 0.0062            | 0.0005            | 0.0063            |
| Sum of PFHxS and PFOS                                     | 355-46-4/1763-23-1 | 0.0002 | mg/kg | 0.0012            | 0.0207            | 0.0055            | 0.0005            | 0.0063            |
| Sum of PFAS (WA DER List)                                 | ----               | 0.0002 | mg/kg | 0.0012            | 0.0207            | 0.0055            | 0.0005            | 0.0063            |
| <b>EP231S: PFAS Surrogate</b>                             |                    |        |       |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                 | ----               | 0.0002 | %     | 91.0              | 98.5              | 104               | 93.0              | 94.5              |
| 13C8-PFOA                                                 | ----               | 0.0002 | %     | 99.5              | 103               | 101               | 98.0              | 107               |



## Analytical Results

Sub-Matrix: SEDIMENT  
 (Matrix: SOIL)

Sample ID

|                                                    |            |        |       | 0960_SS168_220622 | 0960_SS166_220622 | 0960_SS243_220622 | 0960_SS174_220622 | 0960_SS277_220622 |
|----------------------------------------------------|------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                               |            |        |       | 22-Jun-2022 13:51 | 22-Jun-2022 13:54 | 22-Jun-2022 14:25 | 22-Jun-2022 14:29 | 22-Jun-2022 14:34 |
| Compound                                           | CAS Number | LOR    | Unit  | EP2207729-011     | EP2207729-012     | EP2207729-013     | EP2207729-014     | EP2207729-015     |
|                                                    |            |        |       | Result            | Result            | Result            | Result            | Result            |
| <b>EA055: Moisture Content (Dried @ 105-110°C)</b> |            |        |       |                   |                   |                   |                   |                   |
| Moisture Content                                   | ----       | 0.1    | %     | 18.0              | 26.7              | 12.1              | 9.0               | 9.2               |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>       |            |        |       |                   |                   |                   |                   |                   |
| 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 | 0.0014            | 0.0013            | 0.0135            | 0.0047            | 0.0015            |
| Perfluorodecane sulfonic acid (PFDS)               | 335-77-3   | 0.0002 | mg/kg | <0.0002           | <0.0002           | <0.0002           | <0.0002           | <0.0002           |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>     |            |        |       |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>         |            |        |       |                   |                   |                   |                   |                   |
| 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

|                                                           |                    |        |       | 0960_SS168_220622 | 0960_SS166_220622 | 0960_SS243_220622 | 0960_SS174_220622 | 0960_SS277_220622 |
|-----------------------------------------------------------|--------------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                      |                    |        |       | 22-Jun-2022 13:51 | 22-Jun-2022 13:54 | 22-Jun-2022 14:25 | 22-Jun-2022 14:29 | 22-Jun-2022 14:34 |
| Compound                                                  | CAS Number         | LOR    | Unit  | EP2207729-011     | EP2207729-012     | EP2207729-013     | EP2207729-014     | EP2207729-015     |
|                                                           |                    |        |       | Result            | Result            | Result            | Result            | Result            |
| <b>EP231C: Perfluoroalkyl Sulfonamides - Continued</b>    |                    |        |       |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>         |                    |        |       |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231P: PFAS Sums</b>                                  |                    |        |       |                   |                   |                   |                   |                   |
| Sum of PFAS                                               | ----               | 0.0002 | mg/kg | 0.0014            | 0.0013            | 0.0135            | 0.0047            | 0.0015            |
| Sum of PFHxS and PFOS                                     | 355-46-4/1763-23-1 | 0.0002 | mg/kg | 0.0014            | 0.0013            | 0.0135            | 0.0047            | 0.0015            |
| Sum of PFAS (WA DER List)                                 | ----               | 0.0002 | mg/kg | 0.0014            | 0.0013            | 0.0135            | 0.0047            | 0.0015            |
| <b>EP231S: PFAS Surrogate</b>                             |                    |        |       |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                 | ----               | 0.0002 | %     | 102               | 103               | 92.5              | 102               | 98.5              |
| 13C8-PFOA                                                 | ----               | 0.0002 | %     | 99.5              | 96.5              | 101               | 105               | 97.5              |



## Analytical Results

Sub-Matrix: SEDIMENT  
 (Matrix: SOIL)

Sample ID

|                                                    |            |        |       | 0960_SS124_220622 | 0960_SS125_220622 | 0960_SS113_220622 | 0960_SS278_220622 | 0960_QC125_220622 |
|----------------------------------------------------|------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                               |            |        |       | 22-Jun-2022 14:35 | 22-Jun-2022 14:42 | 22-Jun-2022 15:51 | 22-Jun-2022 15:54 | 22-Jun-2022 15:55 |
| Compound                                           | CAS Number | LOR    | Unit  | EP2207729-016     | EP2207729-017     | EP2207729-018     | EP2207729-019     | EP2207729-020     |
|                                                    |            |        |       | Result            | Result            | Result            | Result            | Result            |
| <b>EA055: Moisture Content (Dried @ 105-110°C)</b> |            |        |       |                   |                   |                   |                   |                   |
| Moisture Content                                   | ----       | 0.1    | %     | 19.9              | 10.6              | 11.3              | 9.0               | 9.5               |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>       |            |        |       |                   |                   |                   |                   |                   |
| 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 | 0.365             | 0.0008            | 0.0021            | 0.0003            | 0.0003            |
| Perfluorodecane sulfonic acid (PFDS)               | 335-77-3   | 0.0002 | mg/kg | 0.0015            | <0.0002           | <0.0002           | <0.0002           | <0.0002           |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>     |            |        |       |                   |                   |                   |                   |                   |
| 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 | 0.0028            | <0.0002           | <0.0002           | <0.0002           | <0.0002           |
| Perfluorodecanoic acid (PFDA)                      | 335-76-2   | 0.0002 | mg/kg | 0.0008            | <0.0002           | <0.0002           | <0.0002           | <0.0002           |
| Perfluoroundecanoic acid (PFUnDA)                  | 2058-94-8  | 0.0002 | mg/kg | 0.0003            | <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 (PFTeDA)                 | 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           |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>         |            |        |       |                   |                   |                   |                   |                   |
| 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

|                                                           |                    |        |       | 0960_SS124_220622 | 0960_SS125_220622 | 0960_SS113_220622 | 0960_SS278_220622 | 0960_QC125_220622 |
|-----------------------------------------------------------|--------------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                      |                    |        |       | 22-Jun-2022 14:35 | 22-Jun-2022 14:42 | 22-Jun-2022 15:51 | 22-Jun-2022 15:54 | 22-Jun-2022 15:55 |
| Compound                                                  | CAS Number         | LOR    | Unit  | EP2207729-016     | EP2207729-017     | EP2207729-018     | EP2207729-019     | EP2207729-020     |
|                                                           |                    |        |       | Result            | Result            | Result            | Result            | Result            |
| <b>EP231C: Perfluoroalkyl Sulfonamides - Continued</b>    |                    |        |       |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>         |                    |        |       |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231P: PFAS Sums</b>                                  |                    |        |       |                   |                   |                   |                   |                   |
| Sum of PFAS                                               | ----               | 0.0002 | mg/kg | 0.371             | 0.0008            | 0.0021            | 0.0003            | 0.0003            |
| Sum of PFHxS and PFOS                                     | 355-46-4/1763-23-1 | 0.0002 | mg/kg | 0.365             | 0.0008            | 0.0021            | 0.0003            | 0.0003            |
| Sum of PFAS (WA DER List)                                 | ----               | 0.0002 | mg/kg | 0.365             | 0.0008            | 0.0021            | 0.0003            | 0.0003            |
| <b>EP231S: PFAS Surrogate</b>                             |                    |        |       |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                 | ----               | 0.0002 | %     | 102               | 94.0              | 106               | 106               | 91.5              |
| 13C8-PFOA                                                 | ----               | 0.0002 | %     | 95.5              | 100               | 99.5              | 98.5              | 95.0              |





## Analytical Results

Sub-Matrix: **SEDIMENT**  
 (Matrix: **SOIL**)

Sample ID

0960\_SS157\_220622

| Sampling date / time |            |     | 22-Jun-2022 00:00 | ----          | ----  | ----  | ----  |
|----------------------|------------|-----|-------------------|---------------|-------|-------|-------|
| Compound             | CAS Number | LOR | Unit              | EP2207729-021 | ----- | ----- | ----- |
| Result               |            |     |                   | ----          | ----  | ----  | ----  |

### EA055: Moisture Content (Dried @ 105-110°C)

|                  |      |     |   |      |      |      |      |      |
|------------------|------|-----|---|------|------|------|------|------|
| Moisture Content | ---- | 0.1 | % | 24.6 | ---- | ---- | ---- | ---- |
|------------------|------|-----|---|------|------|------|------|------|

### EP231A: Perfluoroalkyl Sulfonic Acids

|                                        |           |        |       |         |      |      |      |      |
|----------------------------------------|-----------|--------|-------|---------|------|------|------|------|
| Perfluorobutane sulfonic acid (PFBS)   | 375-73-5  | 0.0002 | mg/kg | <0.0002 | ---- | ---- | ---- | ---- |
| Perfluoropentane sulfonic acid (PFPeS) | 2706-91-4 | 0.0002 | mg/kg | <0.0002 | ---- | ---- | ---- | ---- |
| Perfluorohexane sulfonic acid (PFHxS)  | 355-46-4  | 0.0002 | mg/kg | <0.0002 | ---- | ---- | ---- | ---- |
| Perfluoroheptane sulfonic acid (PFHpS) | 375-92-8  | 0.0002 | mg/kg | <0.0002 | ---- | ---- | ---- | ---- |
| Perfluorooctane sulfonic acid (PFOS)   | 1763-23-1 | 0.0002 | mg/kg | 0.0075  | ---- | ---- | ---- | ---- |
| 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<br>(Matrix: SOIL)                    |                    |        |       | Sample ID            | 0960_SS157_220622 | ----  | ----  | ----  | ----  |
|                                                           |                    |        |       | Sampling date / time | 22-Jun-2022 00:00 | ----  | ----  | ----  | ----  |
| Compound                                                  | CAS Number         | LOR    | Unit  |                      | EP2207729-021     | ----- | ----- | ----- | ----- |
|                                                           |                    |        |       | 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 | 0.0075               | ----              | ----  | ----  | ----  | ----  |
| Sum of PFHxS and PFOS                                     | 355-46-4/1763-23-1 | 0.0002 | mg/kg | 0.0075               | ----              | ----  | ----  | ----  | ----  |
| Sum of PFAS (WA DER List)                                 | ----               | 0.0002 | mg/kg | 0.0075               | ----              | ----  | ----  | ----  | ----  |
| EP231S: PFAS Surrogate                                    |                    |        |       |                      |                   |       |       |       |       |
| 13C4-PFOS                                                 | ----               | 0.0002 | %     | 104                  | ----              | ----  | ----  | ----  | ----  |
| 13C8-PFOA                                                 | ----               | 0.0002 | %     | 97.0                 | ----              | ----  | ----  | ----  | ----  |

Page : 13 of 13  
Work Order : EP2207729  
Client : STANTEC AUSTRALIA PTY LTD  
Project : WA\_0960\_PFASOMP



### Surrogate Control Limits

| Sub-Matrix: <b>SEDIMENT</b>   |            | Recovery Limits (%) |      |
|-------------------------------|------------|---------------------|------|
| Compound                      | CAS Number | Low                 | High |
| <b>EP231S: PFAS Surrogate</b> |            |                     |      |
| <b>13C4-PFOS</b>              | ----       | 60                  | 120  |
| <b>13C8-PFOA</b>              | ----       | 60                  | 120  |

### Inter-Laboratory Testing

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

## QUALITY CONTROL REPORT

|                         |                                                   |                         |                                                          |
|-------------------------|---------------------------------------------------|-------------------------|----------------------------------------------------------|
| Work Order              | : EP2207729                                       | Page                    | : 1 of 11                                                |
| Client                  | : STANTEC AUSTRALIA PTY LTD                       | Laboratory              | : Environmental Division Perth                           |
| Contact                 | : [REDACTED]                                      | Contact                 | : [REDACTED]                                             |
| Address                 | : GROUND FLOOR 226 ADELAIDE TERRACE<br>PERTH 6000 | Address                 | : 26 Rigali Way Wangara Western Australia Australia 6065 |
| Telephone               | : ----                                            | Telephone               | : +6138549 9609                                          |
| Project                 | : WA_0960_PFASOMP                                 | Date Samples Received   | : 27-Jun-2022                                            |
| Order number            | : pfas-omp Learmonth                              | Date Analysis Commenced | : 04-Jul-2022                                            |
| C-O-C number            | : 39224                                           | Issue Date              | : 08-Jul-2022                                            |
| Sampler                 | : [REDACTED]                                      |                         |                                                          |
| Site                    | : Learmonth SD - [REDACTED]                       |                         |                                                          |
| Quote number            | : SY/139/19 B                                     |                         |                                                          |
| No. of samples received | : 21                                              |                         |                                                          |
| No. of samples analysed | : 21                                              |                         |                                                          |



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]  | LCMS Coordinator | Sydney Inorganics, Smithfield, NSW |
| [REDACTED]  | LCMS Coordinator | Sydney Organics, Smithfield, NSW   |



## 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: 4437284) |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2207729-003                                                 | 0960_SD219_220622 | EA055: Moisture Content                        | ----       | 0.1                               | %     | 16.2            | 17.2             | 5.9     | 0% - 20%           |
| EP2207729-014                                                 | 0960_SS174_220622 | EA055: Moisture Content                        | ----       | 0.1                               | %     | 9.0             | 10.3             | 13.3    | 0% - 20%           |
| EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4437285) |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2207733-002                                                 | Anonymous         | EA055: Moisture Content                        | ----       | 0.1                               | %     | 13.3            | 13.0             | 2.2     | 0% - 20%           |
| EP2207738-002                                                 | Anonymous         | EA055: Moisture Content                        | ----       | 0.1                               | %     | 29.0            | 29.5             | 1.9     | 0% - 20%           |
| EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4441329)       |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2207729-001                                                 | 0960_SS234_220622 | 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          | 0.0014           | 12.0    | 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 | 0.0333          | 0.0329           | 1.0     | 0% - 20%           |
|                                                               |                   | EP231X: Perfluorodecane sulfonic acid (PFDS)   | 335-77-3   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
| EP2207729-011                                                 | 0960_SS168_220622 | 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 | 0.0014          | 0.0015           | 8.8     | 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: 4441881)       |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2207729-021                                                 | 0960_SS157_220622 | 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: 4441881) - continued |                   |                                                           |                   |                                         |           |                 |                  |         |                    |
| EP2207729-021                                                       | 0960_SS157_220622 | EP231X: Perfluorooctane sulfonic acid (PFOS)              | 1763-23-1         | 0.0002                                  | mg/kg     | 0.0075          | 0.0081           | 7.8     | 0% - 20%           |
|                                                                     |                   | EP231X: Perfluorodecane sulfonic acid (PFDS)              | 335-77-3          | 0.0002                                  | mg/kg     | <0.0002         | <0.0002          | 0.0     | No Limit           |
| EP2207733-010                                                       | 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     | 0.0041          | 0.0042           | 3.2     | 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: 4441329) |                   |                                         |           |                 |                  |         |                    |
| EP2207729-001                                                       | 0960_SS234_220622 | EP231X: Perfluoropentanoic acid (PFPeA)                   | 2706-90-3         | 0.0002                                  | mg/kg     | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                     |                   | EP231X: Perfluorohexanoic acid (PFHxA)                    | 307-24-4          | 0.0002                                  | mg/kg     | 0.0002          | <0.0002          | 0.0     | No Limit           |
|                                                                     |                   | EP231X: Perfluoroheptanoic acid (PFHpA)                   | 375-85-9          | 0.0002                                  | mg/kg     | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                     |                   | EP231X: Perfluorooctanoic acid (PFOA)                     | 335-67-1          | 0.0002                                  | mg/kg     | 0.0003          | 0.0003           | 0.0     | No Limit           |
|                                                                     |                   | EP231X: Perfluorononanoic acid (PFNA)                     | 375-95-1          | 0.0002                                  | mg/kg     | 0.0004          | 0.0004           | 0.0     | No Limit           |
|                                                                     |                   | EP231X: Perfluorodecanoic acid (PFDA)                     | 335-76-2          | 0.0002                                  | mg/kg     | 0.0004          | 0.0004           | 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           |
|                                                                     |                   | EP2207729-011                                             | 0960_SS168_220622 | 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     | <0.0002         | <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           |
| EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4441881)           |                   |                                                           |                   |                                         |           |                 |                  |         |                    |
| EP2207729-021                                                       | 0960_SS157_220622 | 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: 4441881) - continued |                   |                                                                   |            |                                   |       |                 |                  |         |                    |
| EP2207729-021                                                         | 0960_SS157_220622 | EP231X: Perfluorotridecanoic acid (PFTTrDA)                       | 72629-94-8 | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                       |                   | EP231X: Perfluorotetradecanoic acid (PFTTeDA)                     | 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           |
| EP2207733-010                                                         | 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 (PFTTeDA)                     | 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: 4441329)                 |                   |                                                                   |            |                                   |       |                 |                  |         |                    |
| EP2207729-001                                                         | 0960_SS234_220622 | 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           |
| EP2207729-011                                                         | 0960_SS168_220622 | 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: 4441881)        |                   |                                                                   |             |                                   |       |                 |                  |         |                    |
| EP2207729-021                                                | 0960_SS157_220622 | 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           |
| EP2207733-010                                                | 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: 4441329) |                   |                                                                   |             |                                   |       |                 |                  |         |                    |
| EP2207729-001                                                | 0960_SS234_220622 | 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           |
| EP2207729-011                                                | 0960_SS168_220622 | 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           |

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 Work Order : EP2207729  
 Client : STANTEC AUSTRALIA PTY LTD  
 Project : WA\_0960\_PFASOMP



| 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: 4441329) - continued |                   |                                                     |             |                                   |       |                 |                  |         |                    |
| EP2207729-011                                                            | 0960_SS168_220622 | 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: 4441881)             |                   |                                                     |             |                                   |       |                 |                  |         |                    |
| EP2207729-021                                                            | 0960_SS157_220622 | 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           |
| EP2207733-010                                                            | 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           |



## 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**

| Sub-Matrix: SOIL                                         |            |        |       | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                    |                       |     |
|----------------------------------------------------------|------------|--------|-------|-----------------------------|---------------------------------------|--------------------|-----------------------|-----|
|                                                          |            |        |       |                             | Spike<br>Concentration                | Spike Recovery (%) | Acceptable Limits (%) |     |
| Method: Compound                                         | CAS Number | LOR    | Unit  | Result                      |                                       |                    | LCS                   | Low |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4441329)   |            |        |       |                             |                                       |                    |                       |     |
| EP231X: Perfluorobutane sulfonic acid (PFBS)             | 375-73-5   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 116                | 72.0                  | 128 |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)           | 2706-91-4  | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 102                | 73.0                  | 123 |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)            | 355-46-4   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 103                | 67.0                  | 130 |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)           | 375-92-8   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 110                | 70.0                  | 132 |
| EP231X: Perfluorooctane sulfonic acid (PFOS)             | 1763-23-1  | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 105                | 68.0                  | 136 |
| EP231X: Perfluorodecane sulfonic acid (PFDS)             | 335-77-3   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 126                | 59.0                  | 134 |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4441881)   |            |        |       |                             |                                       |                    |                       |     |
| EP231X: Perfluorobutane sulfonic acid (PFBS)             | 375-73-5   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 92.0               | 72.0                  | 128 |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)           | 2706-91-4  | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 112                | 73.0                  | 123 |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)            | 355-46-4   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 100                | 67.0                  | 130 |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)           | 375-92-8   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 113                | 70.0                  | 132 |
| EP231X: Perfluorooctane sulfonic acid (PFOS)             | 1763-23-1  | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 113                | 68.0                  | 136 |
| EP231X: Perfluorodecane sulfonic acid (PFDS)             | 335-77-3   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 105                | 59.0                  | 134 |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4441329) |            |        |       |                             |                                       |                    |                       |     |
| EP231X: Perfluorobutanoic acid (PFBA)                    | 375-22-4   | 0.001  | mg/kg | <0.001                      | 0.00625 mg/kg                         | 108                | 71.0                  | 135 |
| EP231X: Perfluoropentanoic acid (PFPeA)                  | 2706-90-3  | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 111                | 69.0                  | 132 |
| EP231X: Perfluorohexanoic acid (PFHxA)                   | 307-24-4   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 113                | 70.0                  | 132 |
| EP231X: Perfluoroheptanoic acid (PFHpA)                  | 375-85-9   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 122                | 71.0                  | 131 |
| EP231X: Perfluorooctanoic acid (PFOA)                    | 335-67-1   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 119                | 69.0                  | 133 |
| EP231X: Perfluorononanoic acid (PFNA)                    | 375-95-1   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 121                | 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                         | 121                | 64.0                  | 136 |
| EP231X: Perfluorododecanoic acid (PFDoDA)                | 307-55-1   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 120                | 69.0                  | 135 |
| EP231X: Perfluorotridecanoic acid (PFTrDA)               | 72629-94-8 | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 116                | 66.0                  | 139 |
| EP231X: Perfluorotetradecanoic acid (PFTeDA)             | 376-06-7   | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 107                | 69.0                  | 133 |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4441881) |            |        |       |                             |                                       |                    |                       |     |
| EP231X: Perfluorobutanoic acid (PFBA)                    | 375-22-4   | 0.001  | mg/kg | <0.001                      | 0.00625 mg/kg                         | 97.4               | 71.0                  | 135 |
| EP231X: Perfluoropentanoic acid (PFPeA)                  | 2706-90-3  | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 106                | 69.0                  | 132 |
| EP231X: Perfluorohexanoic acid (PFHxA)                   | 307-24-4   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 114                | 70.0                  | 132 |
| EP231X: Perfluoroheptanoic acid (PFHpA)                  | 375-85-9   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 113                | 71.0                  | 131 |
| EP231X: Perfluorooctanoic acid (PFOA)                    | 335-67-1   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 114                | 69.0                  | 133 |
| EP231X: Perfluorononanoic acid (PFNA)                    | 375-95-1   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 116                | 72.0                  | 129 |
| EP231X: Perfluorodecanoic acid (PFDA)                    | 335-76-2   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 117                | 69.0                  | 133 |
| EP231X: Perfluoroundecanoic acid (PFUnDA)                | 2058-94-8  | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 114                | 64.0                  | 136 |



Sub-Matrix: **SOIL**

| Sub-Matrix: SOIL                                                     |             |        |       | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |     |
|----------------------------------------------------------------------|-------------|--------|-------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|-----|
|                                                                      |             |        |       |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |     |
| Method: Compound                                                     | CAS Number  | LOR    | Unit  | Result                      |                                       |                           |                                   |     |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4441881) - continued |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: Perfluorododecanoic acid (PFDoDA)                            | 307-55-1    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 115                       | 69.0                              | 135 |
| EP231X: Perfluorotridecanoic acid (PFTrDA)                           | 72629-94-8  | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 110                       | 66.0                              | 139 |
| EP231X: Perfluorotetradecanoic acid (PFTeDA)                         | 376-06-7    | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 106                       | 69.0                              | 133 |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4441329)                 |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: Perfluorooctane sulfonamide (FOSA)                           | 754-91-6    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 116                       | 67.0                              | 137 |
| EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)                | 31506-32-8  | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 109                       | 71.6                              | 129 |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)                 | 4151-50-2   | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 109                       | 69.8                              | 131 |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)         | 24448-09-7  | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 125                       | 68.7                              | 130 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)          | 1691-99-2   | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 110                       | 65.1                              | 134 |
| 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                         | 86.0                      | 61.0                              | 139 |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4441881)                 |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: Perfluorooctane sulfonamide (FOSA)                           | 754-91-6    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 126                       | 67.0                              | 137 |
| EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)                | 31506-32-8  | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 122                       | 71.6                              | 129 |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)                 | 4151-50-2   | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 99.4                      | 69.8                              | 131 |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)         | 24448-09-7  | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 129                       | 68.7                              | 130 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)          | 1691-99-2   | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 108                       | 65.1                              | 134 |
| 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                         | 78.4                      | 61.0                              | 139 |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4441329)          |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                    | 757124-72-4 | 0.0005 | mg/kg | <0.0005                     | 0.00125 mg/kg                         | 121                       | 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                         | 113                       | 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                         | 118                       | 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                         | 122                       | 69.2                              | 143 |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4441881)          |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                    | 757124-72-4 | 0.0005 | mg/kg | <0.0005                     | 0.00125 mg/kg                         | 75.6                      | 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                         | 109                       | 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                         | 81.2                      | 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                         | 75.2                      | 69.2                              | 143 |



## 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**

| 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: 4441329)   |                   |                                                |            |                          |                  |                       |      |
| EP2207729-001                                            | 0960_SS234_220622 | EP231X: Perfluorobutane sulfonic acid (PFBS)   | 375-73-5   | 0.00125 mg/kg            | 122              | 72.0                  | 128  |
|                                                          |                   | EP231X: Perfluoropentane sulfonic acid (PFPeS) | 2706-91-4  | 0.00125 mg/kg            | 119              | 73.0                  | 123  |
|                                                          |                   | EP231X: Perfluorohexane sulfonic acid (PFHxS)  | 355-46-4   | 0.00125 mg/kg            | 85.6             | 67.0                  | 130  |
|                                                          |                   | EP231X: Perfluoroheptane sulfonic acid (PFHpS) | 375-92-8   | 0.00125 mg/kg            | 116              | 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            | 119              | 59.0                  | 134  |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4441881)   |                   |                                                |            |                          |                  |                       |      |
| EP2207729-021                                            | 0960_SS157_220622 | EP231X: Perfluorobutane sulfonic acid (PFBS)   | 375-73-5   | 0.00125 mg/kg            | 100              | 72.0                  | 128  |
|                                                          |                   | EP231X: Perfluoropentane sulfonic acid (PFPeS) | 2706-91-4  | 0.00125 mg/kg            | 92.4             | 73.0                  | 123  |
|                                                          |                   | EP231X: Perfluorohexane sulfonic acid (PFHxS)  | 355-46-4   | 0.00125 mg/kg            | 97.2             | 67.0                  | 130  |
|                                                          |                   | EP231X: Perfluoroheptane sulfonic acid (PFHpS) | 375-92-8   | 0.00125 mg/kg            | 112              | 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            | 114              | 59.0                  | 134  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4441329) |                   |                                                |            |                          |                  |                       |      |
| EP2207729-001                                            | 0960_SS234_220622 | 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            | 110              | 69.0                  | 132  |
|                                                          |                   | EP231X: Perfluorohexanoic acid (PFHxA)         | 307-24-4   | 0.00125 mg/kg            | 96.8             | 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            | 114              | 69.0                  | 133  |
|                                                          |                   | EP231X: Perfluorononanoic acid (PFNA)          | 375-95-1   | 0.00125 mg/kg            | 109              | 72.0                  | 129  |
|                                                          |                   | EP231X: Perfluorodecanoic acid (PFDA)          | 335-76-2   | 0.00125 mg/kg            | 118              | 69.0                  | 133  |
|                                                          |                   | EP231X: Perfluoroundecanoic acid (PFUnDA)      | 2058-94-8  | 0.00125 mg/kg            | 118              | 64.0                  | 136  |
|                                                          |                   | EP231X: Perfluorododecanoic acid (PFDoDA)      | 307-55-1   | 0.00125 mg/kg            | 119              | 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                                  | 99.7       | 69.0                     | 133              |                       |      |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4441881) |                   |                                                |            |                          |                  |                       |      |
| EP2207729-021                                            | 0960_SS157_220622 | EP231X: Perfluorobutanoic acid (PFBA)          | 375-22-4   | 0.00625 mg/kg            | 82.2             | 71.0                  | 135  |
|                                                          |                   | EP231X: Perfluoropentanoic acid (PFPeA)        | 2706-90-3  | 0.00125 mg/kg            | 108              | 69.0                  | 132  |
|                                                          |                   | EP231X: Perfluorohexanoic acid (PFHxA)         | 307-24-4   | 0.00125 mg/kg            | 111              | 70.0                  | 132  |
|                                                          |                   | EP231X: Perfluoroheptanoic acid (PFHpA)        | 375-85-9   | 0.00125 mg/kg            | 122              | 71.0                  | 131  |
|                                                          |                   | EP231X: Perfluorooctanoic acid (PFOA)          | 335-67-1   | 0.00125 mg/kg            | 115              | 69.0                  | 133  |
|                                                          |                   | EP231X: Perfluorononanoic acid (PFNA)          | 375-95-1   | 0.00125 mg/kg            | 113              | 72.0                  | 129  |



Sub-Matrix: **SOIL**

| 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: 4441881) - continued |                   |                                                                   |             |                          |                  |                       |      |
| EP2207729-021                                                        | 0960_SS157_220622 | EP231X: Perfluorodecanoic acid (PFDA)                             | 335-76-2    | 0.00125 mg/kg            | 113              | 69.0                  | 133  |
|                                                                      |                   | EP231X: Perfluoroundecanoic acid (PFUnDA)                         | 2058-94-8   | 0.00125 mg/kg            | 119              | 64.0                  | 136  |
|                                                                      |                   | EP231X: Perfluorododecanoic acid (PFDoDA)                         | 307-55-1    | 0.00125 mg/kg            | 118              | 69.0                  | 135  |
|                                                                      |                   | EP231X: Perfluorotridecanoic acid (PFTrDA)                        | 72629-94-8  | 0.00125 mg/kg            | 118              | 66.0                  | 139  |
|                                                                      |                   | EP231X: Perfluorotetradecanoic acid (PFTeDA)                      | 376-06-7    | 0.00312 mg/kg            | 106              | 69.0                  | 133  |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4441329)                 |                   |                                                                   |             |                          |                  |                       |      |
| EP2207729-001                                                        | 0960_SS234_220622 | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.00125 mg/kg            | 116              | 67.0                  | 137  |
|                                                                      |                   | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.00312 mg/kg            | 107              | 71.6                  | 129  |
|                                                                      |                   | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.00312 mg/kg            | 91.8             | 69.8                  | 131  |
|                                                                      |                   | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.00312 mg/kg            | 125              | 68.7                  | 130  |
|                                                                      |                   | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.00312 mg/kg            | 108              | 65.1                  | 134  |
|                                                                      |                   | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9   | 0.00125 mg/kg            | 109              | 63.0                  | 144  |
|                                                                      |                   | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.00125 mg/kg            | 94.0             | 61.0                  | 139  |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4441881)                 |                   |                                                                   |             |                          |                  |                       |      |
| EP2207729-021                                                        | 0960_SS157_220622 | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.00125 mg/kg            | 125              | 67.0                  | 137  |
|                                                                      |                   | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.00312 mg/kg            | 114              | 71.6                  | 129  |
|                                                                      |                   | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.00312 mg/kg            | 97.1             | 69.8                  | 131  |
|                                                                      |                   | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.00312 mg/kg            | 117              | 68.7                  | 130  |
|                                                                      |                   | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.00312 mg/kg            | 110              | 65.1                  | 134  |
|                                                                      |                   | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9   | 0.00125 mg/kg            | 118              | 63.0                  | 144  |
|                                                                      |                   | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.00125 mg/kg            | 91.2             | 61.0                  | 139  |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4441329)          |                   |                                                                   |             |                          |                  |                       |      |
| EP2207729-001                                                        | 0960_SS234_220622 | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.00125 mg/kg            | 119              | 62.0                  | 145  |
|                                                                      |                   | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 27619-97-2  | 0.00125 mg/kg            | 124              | 64.0                  | 140  |
|                                                                      |                   | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | 39108-34-4  | 0.00125 mg/kg            | 118              | 65.0                  | 137  |
|                                                                      |                   | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | 120226-60-0 | 0.00125 mg/kg            | 117              | 69.2                  | 143  |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4441881)          |                   |                                                                   |             |                          |                  |                       |      |
| EP2207729-021                                                        | 0960_SS157_220622 | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.00125 mg/kg            | 112              | 62.0                  | 145  |



Sub-Matrix: SOIL

|                                                                         |                   |                                                     |             | 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: 4441881) - continued |                   |                                                     |             |                          |                  |                       |      |
| EP2207729-021                                                           | 0960_SS157_220622 | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)   | 27619-97-2  | 0.00125 mg/kg            | 127              | 64.0                  | 140  |
|                                                                         |                   | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)   | 39108-34-4  | 0.00125 mg/kg            | 128              | 65.0                  | 137  |
|                                                                         |                   | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS) | 120226-60-0 | 0.00125 mg/kg            | 122              | 69.2                  | 143  |



## QA/QC Compliance Assessment to assist with Quality Review

Work Order : EP2207729

Page : 1 of 6

Client : STANTEC AUSTRALIA PTY LTD  
Contact :   
Project : WA\_0960\_PFASOMP  
Site : Learmonth SD -   
Sampler :   
Order number : pfas-omp Learmonth

Laboratory : Environmental Division Perth  
Telephone : +6138549 9609  
Date Samples Received : 27-Jun-2022  
Issue Date : 08-Jul-2022  
No. of samples received : 21  
No. of samples analysed : 21

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.

Page : 2 of 6  
 Work Order : EP2207729  
 Client : STANTEC AUSTRALIA PTY LTD  
 Project : WA\_0960\_PFASOMP



## 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                                                                               |
|---------------------------------------|----------------------|-------------------|--------------------------------------|------------|----------------|--------|---------------------------------------------------------------------------------------|
| <b>Matrix Spike (MS) Recoveries</b>   |                      |                   |                                      |            |                |        |                                                                                       |
| EP231A: Perfluoroalkyl Sulfonic Acids | EP2207729--001       | 0960_SS234_220622 | Perfluorooctane sulfonic acid (PFOS) | 1763-23-1  | Not Determined | ----   | MS recovery not determined, background level greater than or equal to 4x spike level. |
| EP231A: Perfluoroalkyl Sulfonic Acids | EP2207729--021       | 0960_SS157_220622 | Perfluorooctane sulfonic acid (PFOS) | 1763-23-1  | Not Determined | ----   | MS recovery not determined, background level greater than or equal to 4x spike level. |

## Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                                                                                                                                                                                                                        | Sample Date                                                                                                                                                                                                              | Extraction / Preparation |                    |            | Analysis      |                  |             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------|------------|---------------|------------------|-------------|
| Container / Client Sample ID(s)                                                                                                                                                                                                               |                                                                                                                                                                                                                          | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation  |
| <b>EA055: Moisture Content (Dried @ 105-110°C)</b>                                                                                                                                                                                            |                                                                                                                                                                                                                          |                          |                    |            |               |                  |             |
| <b>HDPE Soil Jar (EA055)</b>                                                                                                                                                                                                                  |                                                                                                                                                                                                                          |                          |                    |            |               |                  |             |
| 0960_SS234_220622,<br>0960_SD219_220622,<br>0960_SS231_220622,<br>0960_SS108_220622,<br>0960_SS176_220622,<br>0960_SS168_220622,<br>0960_SS243_220622,<br>0960_SS277_220622,<br>0960_SS125_220622,<br>0960_SS278_220622,<br>0960_SS157_220622 | 0960_SS235_220622,<br>0960_SS114_220622,<br>0960_SS265_220622,<br>0960_SS170_220622,<br>0960_SS279_220622,<br>0960_SS166_220622,<br>0960_SS174_220622,<br>0960_SS124_220622,<br>0960_SS113_220622,<br>0960_QC125_220622, | 22-Jun-2022              | ----               | ----       | ----          | 04-Jul-2022      | 06-Jul-2022 |
|                                                                                                                                                                                                                                               |                                                                                                                                                                                                                          |                          |                    |            |               |                  | ✔           |



Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                  |                    | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |
|-----------------------------------------|--------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|
| Container / Client Sample ID(s)         |                    |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| EP231A: Perfluoroalkyl Sulfonic Acids   |                    |             |                          |                    |            |               |                  |            |
| HDPE Soil Jar (EP231X)                  |                    | 22-Jun-2022 | 06-Jul-2022              | 19-Dec-2022        | ✔          | 07-Jul-2022   | 15-Aug-2022      | ✔          |
| 0960_SS234_220622,                      | 0960_SS235_220622, |             |                          |                    |            |               |                  |            |
| 0960_SD219_220622,                      | 0960_SS114_220622, |             |                          |                    |            |               |                  |            |
| 0960_SS231_220622,                      | 0960_SS265_220622, |             |                          |                    |            |               |                  |            |
| 0960_SS108_220622,                      | 0960_SS170_220622, |             |                          |                    |            |               |                  |            |
| 0960_SS176_220622,                      | 0960_SS279_220622, |             |                          |                    |            |               |                  |            |
| 0960_SS168_220622,                      | 0960_SS166_220622, |             |                          |                    |            |               |                  |            |
| 0960_SS243_220622,                      | 0960_SS174_220622, |             |                          |                    |            |               |                  |            |
| 0960_SS277_220622,                      | 0960_SS124_220622, |             |                          |                    |            |               |                  |            |
| 0960_SS125_220622,                      | 0960_SS113_220622, |             |                          |                    |            |               |                  |            |
| 0960_SS278_220622,                      | 0960_QC125_220622, |             |                          |                    |            |               |                  |            |
| 0960_SS157_220622                       |                    |             |                          |                    |            |               |                  |            |
| EP231B: Perfluoroalkyl Carboxylic Acids |                    |             |                          |                    |            |               |                  |            |
| HDPE Soil Jar (EP231X)                  |                    | 22-Jun-2022 | 06-Jul-2022              | 19-Dec-2022        | ✔          | 07-Jul-2022   | 15-Aug-2022      | ✔          |
| 0960_SS234_220622,                      | 0960_SS235_220622, |             |                          |                    |            |               |                  |            |
| 0960_SD219_220622,                      | 0960_SS114_220622, |             |                          |                    |            |               |                  |            |
| 0960_SS231_220622,                      | 0960_SS265_220622, |             |                          |                    |            |               |                  |            |
| 0960_SS108_220622,                      | 0960_SS170_220622, |             |                          |                    |            |               |                  |            |
| 0960_SS176_220622,                      | 0960_SS279_220622, |             |                          |                    |            |               |                  |            |
| 0960_SS168_220622,                      | 0960_SS166_220622, |             |                          |                    |            |               |                  |            |
| 0960_SS243_220622,                      | 0960_SS174_220622, |             |                          |                    |            |               |                  |            |
| 0960_SS277_220622,                      | 0960_SS124_220622, |             |                          |                    |            |               |                  |            |
| 0960_SS125_220622,                      | 0960_SS113_220622, |             |                          |                    |            |               |                  |            |
| 0960_SS278_220622,                      | 0960_QC125_220622, |             |                          |                    |            |               |                  |            |
| 0960_SS157_220622                       |                    |             |                          |                    |            |               |                  |            |
| EP231C: Perfluoroalkyl Sulfonamides     |                    |             |                          |                    |            |               |                  |            |
| HDPE Soil Jar (EP231X)                  |                    | 22-Jun-2022 | 06-Jul-2022              | 19-Dec-2022        | ✔          | 07-Jul-2022   | 15-Aug-2022      | ✔          |
| 0960_SS234_220622,                      | 0960_SS235_220622, |             |                          |                    |            |               |                  |            |
| 0960_SD219_220622,                      | 0960_SS114_220622, |             |                          |                    |            |               |                  |            |
| 0960_SS231_220622,                      | 0960_SS265_220622, |             |                          |                    |            |               |                  |            |
| 0960_SS108_220622,                      | 0960_SS170_220622, |             |                          |                    |            |               |                  |            |
| 0960_SS176_220622,                      | 0960_SS279_220622, |             |                          |                    |            |               |                  |            |
| 0960_SS168_220622,                      | 0960_SS166_220622, |             |                          |                    |            |               |                  |            |
| 0960_SS243_220622,                      | 0960_SS174_220622, |             |                          |                    |            |               |                  |            |
| 0960_SS277_220622,                      | 0960_SS124_220622, |             |                          |                    |            |               |                  |            |
| 0960_SS125_220622,                      | 0960_SS113_220622, |             |                          |                    |            |               |                  |            |
| 0960_SS278_220622,                      | 0960_QC125_220622, |             |                          |                    |            |               |                  |            |
| 0960_SS157_220622                       |                    |             |                          |                    |            |               |                  |            |





## Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

| Quality Control Sample Type                          |        | Count |         | Rate (%) |          |            | Quality Control Specification  |
|------------------------------------------------------|--------|-------|---------|----------|----------|------------|--------------------------------|
| Analytical Methods                                   | Method | QC    | Regular | Actual   | Expected | Evaluation |                                |
|                                                      |        |       |         |          |          |            |                                |
| Laboratory Duplicates (DUP)                          |        |       |         |          |          |            |                                |
| Moisture Content                                     | EA055  | 4     | 40      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 4     | 40      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Laboratory Control Samples (LCS)                     |        |       |         |          |          |            |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 2     | 40      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Method Blanks (MB)                                   |        |       |         |          |          |            |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 2     | 40      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Matrix Spikes (MS)                                   |        |       |         |          |          |            |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 2     | 40      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |



## Brief Method Summaries

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

| Analytical Methods                                   | Method | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------------------------------------------|--------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Moisture Content                                     | EA055  | SOIL   | In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | SOIL   | In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements. |
| Preparation Methods                                  | Method | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| QuEChERS Extraction of Solids                        | ORG71  | SOIL   | In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.                                                                                                                                                                                                                                   |



# CHAIN OF CUSTODY

COC#: 39225

ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: Learmonth GW - SC

ORDER NO: pfas-omp Learmonth

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:

## SAMPLE DETAILS

## ANALYSIS REQUIRED

| SAMPLE | NAME       | DESCRIPTION          | DATE / TIME         | MATRIX | TOTAL BOTTLES        | ON HOLD | Ground Waters WATER | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|------------|----------------------|---------------------|--------|----------------------|---------|---------------------|----------------------|------------------------|
| 001    | 0960_MW127 |                      | 22/06/2022 08:37 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |                      |                        |
| 002    | 0960_MW126 |                      | 22/06/2022 08:55 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |                      |                        |
| 003    | 0960_MW021 |                      | 22/06/2022 09:12 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |                      |                        |
| 004    | 0960_MW018 |                      | 22/06/2022 09:35 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |                      |                        |
| 005    | 0960_QC117 |                      | 22/06/2022 09:36 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |                      |                        |
| 006    | 0960_MW114 | Lab qc bottles added | 22/06/2022 09:52 AM | Water  | ALS: 5<br>Non ALS: 0 | No      | Partial 4/8         |                      |                        |
| 007    | 0960_MW233 |                      | 22/06/2022 10:39 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |                      |                        |
| 008    | 0960_MW113 |                      | 22/06/2022 11:04 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |                      |                        |
| 009    | 0960_MW162 |                      | 22/06/2022 11:14 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |                      |                        |





# CHAIN OF CUSTODY

ALS

COC#: 39225

ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: Learmonth GW - SC

ORDER NO: pfas-omp Learmonth

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:

## SAMPLE DETAILS

## ANALYSIS REQUIRED

| SAMPLE | NAME             | DESCRIPTION | DATE / TIME         | MATRIX | TOTAL BOTTLES        | ON HOLD | Ground Waters WATER | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|------------------|-------------|---------------------|--------|----------------------|---------|---------------------|----------------------|------------------------|
| 010    | 0960_MW139       |             | 22/06/2022 12:26 PM | Water  | ALS: 5<br>Non ALS: 0 | No      | Partial 4/8         |                      |                        |
| 011    | 0960_MW145_3-3.5 |             | 22/06/2022 12:52 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |                      |                        |
| 012    | 0960_MW143_3-3.5 |             | 22/06/2022 01:13 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |                      |                        |
| 013    | 0960_MW138_3-3.5 |             | 22/06/2022 02:43 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |                      |                        |
| 014    | 0960_QC124       |             | 22/06/2022 03:37 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |                      |                        |
| 015    | 0960_MW122       |             | 22/06/2022 03:38 PM | Water  | ALS: 5<br>Non ALS: 0 | No      | Partial 4/8         |                      |                        |
| 016    | 0960_MW146_3-3.5 |             | 22/06/2022 04:06 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |                      |                        |
| 017    | 0960_MW144_3-3.5 |             | 22/06/2022 04:28 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |                      |                        |



# CHAIN OF CUSTODY

ALS COC#: 39225

ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: Learmonth GW - SC

ORDER NO: pfas-omp Learmonth

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:

| SAMPLE | SAMPLE NAME | PARTIAL ANALYSIS GROUP NAME | MATRIX | SELECTED ANALYSIS NAME                                                                                                                                                                                      |
|--------|-------------|-----------------------------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 001    | 0960_MW127  | Ground Waters WATER         | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 002    | 0960_MW126  | Ground Waters WATER         | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 003    | 0960_MW021  | Ground Waters WATER         | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 004    | 0960_MW018  | Ground Waters WATER         | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 005    | 0960_QC117  | Ground Waters WATER         | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 006    | 0960_MW114  | Ground Waters WATER         | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 007    | 0960_MW233  | Ground Waters WATER         | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 008    | 0960_MW113  | Ground Waters WATER         | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 009    | 0960_MW162  | Ground Waters WATER         | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |



# CHAIN OF CUSTODY

COC#: 39225

ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: Learmonth GW - SC

ORDER NO: pfas-omp Learmonth

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:

|     |                  |                     |       |                                                                                                                                                                                                             |
|-----|------------------|---------------------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 010 | 0960_MW139       | Ground Waters WATER | Water | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 011 | 0960_MW145_3-3.5 | Ground Waters WATER | Water | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 012 | 0960_MW143_3-3.5 | Ground Waters WATER | Water | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 013 | 0960_MW138_3-3.5 | Ground Waters WATER | Water | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 014 | 0960_QC124       | Ground Waters WATER | Water | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 015 | 0960_MW122       | Ground Waters WATER | Water | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 016 | 0960_MW146_3-3.5 | Ground Waters WATER | Water | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 017 | 0960_MW144_3-3.5 | Ground Waters WATER | Water | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |



# CHAIN OF CUSTODY

ALS

COC#: 39225

ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: Learmonth GW - SC

ORDER NO: pfas-omp Learmonth

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:

| SAMPLE | SAMPLE NAME | BOTTLE NAME                    | VOLUME | BARCODE        | TYPE  | FILTERED | REASON |
|--------|-------------|--------------------------------|--------|----------------|-------|----------|--------|
| 001    | 0960_MW127  | HDPE (no PTFE)                 | 20 mL  | 00352101071732 | Grey  | No       |        |
| 001    | 0960_MW127  | Clear Plastic Bottle - Natural | 500 mL | 00070621191103 | Green | No       |        |
| 001    | 0960_MW127  | HDPE (no PTFE)                 | 20 mL  | 00352101071694 | Grey  | No       |        |
| 002    | 0960_MW126  | HDPE (no PTFE)                 | 20 mL  | 00352101071506 | Grey  | No       |        |
| 002    | 0960_MW126  | Clear Plastic Bottle - Natural | 500 mL | 00070621191158 | Green | No       |        |
| 002    | 0960_MW126  | HDPE (no PTFE)                 | 20 mL  | 00352101071901 | Grey  | No       |        |
| 003    | 0960_MW021  | HDPE (no PTFE)                 | 20 mL  | 00352101071045 | Grey  | No       |        |
| 003    | 0960_MW021  | HDPE (no PTFE)                 | 20 mL  | 00352101071420 | Grey  | No       |        |
| 003    | 0960_MW021  | Clear Plastic Bottle - Natural | 500 mL | 00070621190939 | Green | No       |        |
| 004    | 0960_MW018  | Clear Plastic Bottle - Natural | 500 mL | 00070621191081 | Green | No       |        |
| 004    | 0960_MW018  | HDPE (no PTFE)                 | 20 mL  | 00352101071811 | Grey  | No       |        |
| 004    | 0960_MW018  | HDPE (no PTFE)                 | 20 mL  | 00352101038057 | Grey  | No       |        |
| 005    | 0960_QC117  | Clear Plastic Bottle - Natural | 500 mL | 00070621070560 | Green | No       |        |
| 005    | 0960_QC117  | HDPE (no PTFE)                 | 20 mL  | 00352101071079 | Grey  | No       |        |
| 005    | 0960_QC117  | HDPE (no PTFE)                 | 20 mL  | 00352101071591 | Grey  | No       |        |
| 006    | 0960_MW114  | Clear Plastic Bottle - Natural | 500 mL | 00070621191174 | Green | No       |        |
| 006    | 0960_MW114  | HDPE (no PTFE)                 | 20 mL  | 00352101071598 | Grey  | No       |        |
| 006    | 0960_MW114  | HDPE (no PTFE)                 | 20 mL  | 00352101071064 | Grey  | No       |        |
| 006    | 0960_MW114  | HDPE (no PTFE)                 | 20 mL  | 00352005007096 | Grey  | No       |        |
| 006    | 0960_MW114  | HDPE (no PTFE)                 | 20 mL  | 00350019165897 | Grey  | No       |        |
| 007    | 0960_MW233  | HDPE (no PTFE)                 | 20 mL  | 00352101071666 | Grey  | No       |        |
| 007    | 0960_MW233  | HDPE (no PTFE)                 | 20 mL  | 00352101071343 | Grey  | No       |        |
| 007    | 0960_MW233  | Clear Plastic Bottle - Natural | 500 mL | 00070621191115 | Green | No       |        |
| 008    | 0960_MW113  | HDPE (no PTFE)                 | 20 mL  | 00352101071764 | Grey  | No       |        |
| 008    | 0960_MW113  | HDPE (no PTFE)                 | 20 mL  | 00352101071660 | Grey  | No       |        |
| 008    | 0960_MW113  | Clear Plastic Bottle - Natural | 500 mL | 00070621191269 | Green | No       |        |



# CHAIN OF CUSTODY

COC#: 39225

ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: Learmonth GW - SC

ORDER NO: pfas-omp Learmonth

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:

|     |                  |                                |        |                |       |    |  |
|-----|------------------|--------------------------------|--------|----------------|-------|----|--|
| 009 | 0960_MW162       | Clear Plastic Bottle - Natural | 500 mL | 00070621191036 | Green | No |  |
| 009 | 0960_MW162       | HDPE (no PTFE)                 | 20 mL  | 00352101071675 | Grey  | No |  |
| 009 | 0960_MW162       | HDPE (no PTFE)                 | 20 mL  | 00352101071818 | Grey  | No |  |
| 010 | 0960_MW139       | Clear Plastic Bottle - Natural | 500 mL | 00070621191166 | Green | No |  |
| 010 | 0960_MW139       | HDPE (no PTFE)                 | 20 mL  | 00352101071668 | Grey  | No |  |
| 010 | 0960_MW139       | HDPE (no PTFE)                 | 20 mL  | 00350019112568 | Grey  | No |  |
| 010 | 0960_MW139       | HDPE (no PTFE)                 | 20 mL  | 00350019165906 | Grey  | No |  |
| 010 | 0960_MW139       | HDPE (no PTFE)                 | 20 mL  | 00352101070985 | Grey  | No |  |
| 011 | 0960_MW145_3-3.5 | Clear Plastic Bottle - Natural | 500 mL | 00070621191186 | Green | No |  |
| 011 | 0960_MW145_3-3.5 | HDPE (no PTFE)                 | 20 mL  | 00352101071673 | Grey  | No |  |
| 011 | 0960_MW145_3-3.5 | HDPE (no PTFE)                 | 20 mL  | 00352101071916 | Grey  | No |  |
| 012 | 0960_MW143_3-3.5 | Clear Plastic Bottle - Natural | 500 mL | 00070621191203 | Green | No |  |
| 012 | 0960_MW143_3-3.5 | HDPE (no PTFE)                 | 20 mL  | 00352101071749 | Grey  | No |  |
| 012 | 0960_MW143_3-3.5 | HDPE (no PTFE)                 | 20 mL  | 00352101071768 | Grey  | No |  |
| 013 | 0960_MW138_3-3.5 | Clear Plastic Bottle - Natural | 500 mL | 00070621089970 | Green | No |  |
| 013 | 0960_MW138_3-3.5 | HDPE (no PTFE)                 | 20 mL  | 00350821023990 | Grey  | No |  |
| 013 | 0960_MW138_3-3.5 | HDPE (no PTFE)                 | 20 mL  | 00350821023793 | Grey  | No |  |
| 014 | 0960_QC124       | HDPE (no PTFE)                 | 20 mL  | 00352101070898 | Grey  | No |  |
| 014 | 0960_QC124       | HDPE (no PTFE)                 | 20 mL  | 00352101071396 | Grey  | No |  |
| 014 | 0960_QC124       | Clear Plastic Bottle - Natural | 500 mL | 00070621191250 | Green | No |  |
| 015 | 0960_MW122       | HDPE (no PTFE)                 | 20 mL  | 00350821023819 | Grey  | No |  |
| 015 | 0960_MW122       | HDPE (no PTFE)                 | 20 mL  | 00352101071273 | Grey  | No |  |
| 015 | 0960_MW122       | HDPE (no PTFE)                 | 20 mL  | 00350019008203 | Grey  | No |  |
| 015 | 0960_MW122       | HDPE (no PTFE)                 | 20 mL  | 00350821043211 | Grey  | No |  |
| 015 | 0960_MW122       | Clear Plastic Bottle - Natural | 500 mL | 00070621089909 | Green | No |  |
| 016 | 0960_MW146_3-3.5 | Clear Plastic Bottle - Natural | 500 mL | 00070621191258 | Green | No |  |
| 016 | 0960_MW146_3-3.5 | HDPE (no PTFE)                 | 20 mL  | 00352101070870 | Grey  | No |  |



# CHAIN OF CUSTODY

COC#: 39225

ALS Laboratory, EP Perth

CLIENT: MWH AUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: Learmonth GW - SC

ORDER NO: pfas-omp Learmonth

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:

|     |                  |                                |        |                |       |    |  |
|-----|------------------|--------------------------------|--------|----------------|-------|----|--|
| 016 | 0960_MW144_3-3.5 | HDPE (no PTFE)                 | 20 mL  | 00352101071836 | Grey  | No |  |
| 017 | 0960_MW144_3-3.5 | HDPE (no PTFE)                 | 20 mL  | 00352101071805 | Grey  | No |  |
| 017 | 0960_MW144_3-3.5 | Clear Plastic Bottle - Natural | 500 mL | 00070621070510 | Green | No |  |
| 017 | 0960_MW144_3-3.5 | HDPE (no PTFE)                 | 20 mL  | 00352101038048 | Grey  | No |  |

Total Bottle Count: ALS: 57, Non ALS: 0

**SAMPLE RECEIPT NOTIFICATION (SRN)****Work Order : EP2207731**

Client : **STANTEC AUSTRALIA PTY LTD**  
Contact : [REDACTED]  
Address : GROUND FLOOR 226 ADELAIDE  
TERRACE  
PERTH 6000

Laboratory : Environmental Division Perth  
Contact : [REDACTED]  
Address : 26 Rigali Way Wangara Western  
Australia Australia 6065

E-mail : [REDACTED]@stantec.com  
Telephone : ----  
Facsimile : ----

E-mail : [REDACTED]@alsglobal.com  
Telephone : +6138549 9609  
Facsimile : +61-8-9406 1399

Project : WA\_0960\_PFASOMP  
Order number : pfas-omp Learmonth  
C-O-C number : 39225  
Site : Learmonth GW - [REDACTED]  
Sampler : [REDACTED]

Page : 1 of 3  
Quote number : ES2022MWHAUS0002 (SY/139/19 B)  
QC Level : NEPM 2013 B3 & ALS QC Standard

**Dates**

Date Samples Received : 27-Jun-2022 11:40  
Client Requested Due : 08-Jul-2022  
Date

Issue Date : 28-Jun-2022  
Scheduled Reporting Date : **08-Jul-2022**

**Delivery Details**

Mode of Delivery : Carrier  
No. of coolers/boxes : 5  
Receipt Detail :

Security Seal : Not Available  
Temperature : 13.4 - Ice present  
No. of samples received / analysed : 17 / 17

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





## Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exists.

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

EP2207731-011 : 22-Jun-2022 12:52 : 0960\_MW145\_3-3.5\_220622  
EP2207731-012 : 22-Jun-2022 13:13 : 0960\_MW143\_3-3.5\_220622  
EP2207731-013 : 22-Jun-2022 14:43 : 0960\_MW138\_3-3.5\_220622  
EP2207731-016 : 22-Jun-2022 16:06 : 0960\_MW146\_3-3.5\_220622  
EP2207731-017 : 22-Jun-2022 16:28 : 0960\_MW144\_3-3.5\_220622

## 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 - EN055 - PG<br>Ionic Balance by ED037P, ED041G, ED045G &<br>WATER - EP231X<br>PFAS - Full Suite (28 analytes) | WATER - NT-01<br>Major Cations (Ca, Mg, Na, K) | WATER - NT-02<br>Major Anions (Chloride, Sulphate, Alkalinity) |
|----------------------|----------------------|-------------------------|----------------------------------------------------------------------------------------------------------------------|------------------------------------------------|----------------------------------------------------------------|
| EP2207731-001        | 22-Jun-2022 08:37    | 0960_MW127_220622       | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2207731-002        | 22-Jun-2022 08:55    | 0960_MW126_220622       | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2207731-003        | 22-Jun-2022 09:12    | 0960_MW021_220622       | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2207731-004        | 22-Jun-2022 09:35    | 0960_MW018_220622       | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2207731-005        | 22-Jun-2022 09:36    | 0960_QC117_220622       | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2207731-006        | 22-Jun-2022 09:52    | 0960_MW114_220622       | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2207731-007        | 22-Jun-2022 10:39    | 0960_MW233_220622       | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2207731-008        | 22-Jun-2022 11:04    | 0960_MW113_220622       | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2207731-009        | 22-Jun-2022 11:14    | 0960_MW162_220622       | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2207731-010        | 22-Jun-2022 12:26    | 0960_MW139_220622       | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2207731-011        | 22-Jun-2022 12:52    | 0960_MW145_3-3.5_220... | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2207731-012        | 22-Jun-2022 13:13    | 0960_MW143_3-3.5_220... | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2207731-013        | 22-Jun-2022 14:43    | 0960_MW138_3-3.5_220... | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2207731-014        | 22-Jun-2022 15:37    | 0960_QC124_220622       | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2207731-015        | 22-Jun-2022 15:38    | 0960_MW122_220622       | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2207731-016        | 22-Jun-2022 16:06    | 0960_MW146_3-3.5_220... | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2207731-017        | 22-Jun-2022 16:28    | 0960_MW144_3-3.5_220... | ✓                                                                                                                    | ✓                                              | ✓                                                              |

## Proactive Holding Time Report

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

[REDACTED] [REDACTED]

- Email [REDACTED]cardno.com.au

- EDI Format - ESDAT (ESDAT)

- Email [derp.labreports@esdat.com.au](mailto:derp.labreports@esdat.com.au)

- [illegible]

## CERTIFICATE OF ANALYSIS

**Work Order** : **EP2207731**  
**Client** : **STANTEC AUSTRALIA PTY LTD**  
**Contact** : [REDACTED]  
**Address** : GROUND FLOOR 226 ADELAIDE TERRACE  
 PERTH 6000  
**Telephone** : ----  
**Project** : WA\_0960\_PFASOMP  
**Order number** : pfas-omp Learmonth  
**C-O-C number** : 39225  
**Sampler** : [REDACTED]  
**Site** : Learmonth GW - [REDACTED]  
**Quote number** : SY/139/19 B  
**No. of samples received** : 17  
**No. of samples analysed** : 17

**Page** : 1 of 15  
**Laboratory** : Environmental Division Perth  
**Contact** : [REDACTED]  
**Address** : 26 Rigali Way Wangara Western Australia Australia 6065  
**Telephone** : +6138549 9609  
**Date Samples Received** : 27-Jun-2022 11:40  
**Date Analysis Commenced** : 29-Jun-2022  
**Issue Date** : 11-Jul-2022 14:11



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>                |
|------------------------------------------------------------------------|----------------------------|----------------------------------------------|
| Canhuang Ke                                                            | Inorganics Supervisor      | Perth Inorganics, Wangara, Western Australia |
| <span style="background-color: black; color: black;">[REDACTED]</span> | Laboratory Manager (Perth) | Perth Inorganics, Wangara, Western Australia |
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator           | Sydney Organics, Smithfield, NSW             |



## 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.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- 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.
- ED093F: Major Cations for sample #13 and 14 have been confirmed by re-preparation and re-analysis.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                                   |             |      |       | 0960_MW127_220622 | 0960_MW126_220622 | 0960_MW021_220622 | 0960_MW018_220622 | 0960_QC117_220622 |
|-------------------------------------------------------------------|-------------|------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                              |             |      |       | 22-Jun-2022 08:37 | 22-Jun-2022 08:55 | 22-Jun-2022 09:12 | 22-Jun-2022 09:35 | 22-Jun-2022 09:36 |
| Compound                                                          | CAS Number  | LOR  | Unit  | EP2207731-001     | EP2207731-002     | EP2207731-003     | EP2207731-004     | EP2207731-005     |
|                                                                   |             |      |       | Result            | Result            | Result            | Result            | Result            |
| <b>ED037P: Alkalinity by PC Titrator</b>                          |             |      |       |                   |                   |                   |                   |                   |
| Hydroxide Alkalinity as CaCO <sub>3</sub>                         | DMO-210-001 | 1    | mg/L  | <1                | <1                | <1                | <1                | <1                |
| Carbonate Alkalinity as CaCO <sub>3</sub>                         | 3812-32-6   | 1    | mg/L  | <1                | <1                | <1                | <1                | <1                |
| Bicarbonate Alkalinity as CaCO <sub>3</sub>                       | 71-52-3     | 1    | mg/L  | 165               | 198               | 1150              | 996               | 995               |
| Total Alkalinity as CaCO <sub>3</sub>                             | ----        | 1    | mg/L  | 165               | 198               | 1150              | 996               | 995               |
| <b>ED041G: Sulfate (Turbidimetric) as SO<sub>4</sub> 2- by DA</b> |             |      |       |                   |                   |                   |                   |                   |
| Sulfate as SO <sub>4</sub> - Turbidimetric                        | 14808-79-8  | 1    | mg/L  | 2570              | 2510              | 86                | 166               | 156               |
| <b>ED045G: Chloride by Discrete Analyser</b>                      |             |      |       |                   |                   |                   |                   |                   |
| Chloride                                                          | 16887-00-6  | 1    | mg/L  | 24000             | 25100             | 234               | 214               | 197               |
| <b>ED093F: Dissolved Major Cations</b>                            |             |      |       |                   |                   |                   |                   |                   |
| Calcium                                                           | 7440-70-2   | 1    | mg/L  | 1070              | 1020              | 4                 | 8                 | 8                 |
| Magnesium                                                         | 7439-95-4   | 1    | mg/L  | 1630              | 1840              | 7                 | 10                | 10                |
| Sodium                                                            | 7440-23-5   | 1    | mg/L  | 13900             | 14400             | 612               | 536               | 552               |
| Potassium                                                         | 7440-09-7   | 1    | mg/L  | 548               | 736               | 21                | 21                | 20                |
| <b>EN055: Ionic Balance</b>                                       |             |      |       |                   |                   |                   |                   |                   |
| ∅ Total Anions                                                    | ----        | 0.01 | meq/L | 734               | 764               | 31.4              | 29.4              | 28.7              |
| ∅ Total Cations                                                   | ----        | 0.01 | meq/L | 806               | 848               | 27.9              | 25.1              | 25.7              |
| ∅ Ionic Balance                                                   | ----        | 0.01 | %     | 4.70              | 5.17              | 5.79              | 7.93              | 5.40              |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>                      |             |      |       |                   |                   |                   |                   |                   |
| Perfluorobutane sulfonic acid (PFBS)                              | 375-73-5    | 0.02 | µg/L  | <0.02             | <0.02             | 0.11              | 0.06              | 0.05              |
| Perfluoropentane sulfonic acid (PFPeS)                            | 2706-91-4   | 0.02 | µg/L  | <0.02             | <0.02             | 0.10              | 0.08              | 0.07              |
| Perfluorohexane sulfonic acid (PFHxS)                             | 355-46-4    | 0.01 | µg/L  | <0.01             | <0.01             | 0.67              | 1.14              | 1.03              |
| 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  | <0.01             | <0.01             | 0.33              | 0.55              | 0.52              |
| Perfluorodecane sulfonic acid (PFDS)                              | 335-77-3    | 0.02 | µg/L  | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>                    |             |      |       |                   |                   |                   |                   |                   |
| Perfluorobutanoic acid (PFBA)                                     | 375-22-4    | 0.1  | µg/L  | <0.1              | <0.1              | <0.1              | 0.8               | 0.7               |
| Perfluoropentanoic acid (PFPeA)                                   | 2706-90-3   | 0.02 | µg/L  | <0.02             | <0.02             | 0.04              | 1.92              | 1.72              |
| Perfluorohexanoic acid (PFHxA)                                    | 307-24-4    | 0.02 | µg/L  | <0.02             | <0.02             | 0.13              | 1.89              | 1.70              |
| Perfluoroheptanoic acid (PFHpA)                                   | 375-85-9    | 0.02 | µg/L  | <0.02             | <0.02             | <0.02             | 0.79              | 0.68              |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_MW127_220622 | 0960_MW126_220622 | 0960_MW021_220622 | 0960_MW018_220622 | 0960_QC117_220622 |
|------------------------------------------------------------|-------------|------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                       |             |      |      | 22-Jun-2022 08:37 | 22-Jun-2022 08:55 | 22-Jun-2022 09:12 | 22-Jun-2022 09:35 | 22-Jun-2022 09:36 |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2207731-001     | EP2207731-002     | EP2207731-003     | EP2207731-004     | EP2207731-005     |
|                                                            |             |      |      | Result            | Result            | Result            | Result            | Result            |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                   |                   |                   |                   |                   |
| Perfluorooctanoic acid (PFOA)                              | 335-67-1    | 0.01 | µg/L | <0.01             | <0.01             | <b>0.02</b>       | <b>0.09</b>       | <b>0.08</b>       |
| 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             |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                   |                   |                   |                   |                   |
| Perfluorooctane sulfonamide (FOSA)                         | 754-91-6    | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)              | 31506-32-8  | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)               | 4151-50-2   | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)       | 24448-09-7  | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)        | 1691-99-2   | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)  | 2355-31-9   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)   | 2991-50-6   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                   |                   |                   |                   |                   |
| 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             |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_MW127_220622 | 0960_MW126_220622 | 0960_MW021_220622 | 0960_MW018_220622 | 0960_QC117_220622 |
|---------------------------------------------------------------|--------------------|------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                          |                    |      |      | 22-Jun-2022 08:37 | 22-Jun-2022 08:55 | 22-Jun-2022 09:12 | 22-Jun-2022 09:35 | 22-Jun-2022 09:36 |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2207731-001     | EP2207731-002     | EP2207731-003     | EP2207731-004     | EP2207731-005     |
|                                                               |                    |      |      | Result            | Result            | Result            | Result            | Result            |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                   |                   |                   |                   |                   |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                   |                   |                   |                   |                   |
| Sum of PFAS                                                   | ----               | 0.01 | µg/L | <0.01             | <0.01             | 1.40              | 7.37              | 6.59              |
| Sum of PFHxS and PFOS                                         | 355-46-4/1763-23-1 | 0.01 | µg/L | <0.01             | <0.01             | 1.00              | 1.69              | 1.55              |
| Sum of PFAS (WA DER List)                                     | ----               | 0.01 | µg/L | <0.01             | <0.01             | 1.30              | 7.24              | 6.48              |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 95.7              | 96.6              | 104               | 96.8              | 94.4              |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 98.2              | 103               | 104               | 98.7              | 97.0              |





## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                        |             |      |       | 0960_MW114_220622 | 0960_MW233_220622 | 0960_MW113_220622 | 0960_MW162_220622 | 0960_MW139_220622 |
|--------------------------------------------------------|-------------|------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                   |             |      |       | 22-Jun-2022 09:52 | 22-Jun-2022 10:39 | 22-Jun-2022 11:04 | 22-Jun-2022 11:14 | 22-Jun-2022 12:26 |
| Compound                                               | CAS Number  | LOR  | Unit  | EP2207731-006     | EP2207731-007     | EP2207731-008     | EP2207731-009     | EP2207731-010     |
|                                                        |             |      |       | Result            | Result            | Result            | Result            | Result            |
| <b>ED037P: Alkalinity by PC Titrator</b>               |             |      |       |                   |                   |                   |                   |                   |
| Hydroxide Alkalinity as CaCO3                          | DMO-210-001 | 1    | mg/L  | <1                | <1                | <1                | <1                | <1                |
| Carbonate Alkalinity as CaCO3                          | 3812-32-6   | 1    | mg/L  | <1                | 3                 | <1                | <1                | <1                |
| Bicarbonate Alkalinity as CaCO3                        | 71-52-3     | 1    | mg/L  | 460               | 580               | 396               | 497               | 194               |
| Total Alkalinity as CaCO3                              | ----        | 1    | mg/L  | 460               | 584               | 396               | 497               | 194               |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b> |             |      |       |                   |                   |                   |                   |                   |
| Sulfate as SO4 - Turbidimetric                         | 14808-79-8  | 1    | mg/L  | 264               | 41                | 261               | 385               | 3800              |
| <b>ED045G: Chloride by Discrete Analyser</b>           |             |      |       |                   |                   |                   |                   |                   |
| Chloride                                               | 16887-00-6  | 1    | mg/L  | 2670              | 226               | 3410              | 3940              | 21800             |
| <b>ED093F: Dissolved Major Cations</b>                 |             |      |       |                   |                   |                   |                   |                   |
| Calcium                                                | 7440-70-2   | 1    | mg/L  | 123               | 3                 | 188               | 210               | 739               |
| Magnesium                                              | 7439-95-4   | 1    | mg/L  | 116               | 3                 | 169               | 247               | 1760              |
| Sodium                                                 | 7440-23-5   | 1    | mg/L  | 1520              | 342               | 1640              | 2190              | 12600             |
| Potassium                                              | 7440-09-7   | 1    | mg/L  | 62                | 14                | 71                | 124               | 754               |
| <b>EN055: Ionic Balance</b>                            |             |      |       |                   |                   |                   |                   |                   |
| ∅ Total Anions                                         | ----        | 0.01 | meq/L | 90.0              | 18.9              | 110               | 129               | 698               |
| ∅ Total Cations                                        | ----        | 0.01 | meq/L | 83.4              | 15.6              | 96.4              | 129               | 749               |
| ∅ Ionic Balance                                        | ----        | 0.01 | %     | 3.82              | 9.46              | 6.36              | 0.06              | 3.53              |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>           |             |      |       |                   |                   |                   |                   |                   |
| Perfluorobutane sulfonic acid (PFBS)                   | 375-73-5    | 0.02 | µg/L  | <0.02             | 0.10              | <0.02             | 0.52              | <0.02             |
| Perfluoropentane sulfonic acid (PFPeS)                 | 2706-91-4   | 0.02 | µg/L  | <0.02             | 0.13              | <0.02             | 0.50              | <0.02             |
| Perfluorohexane sulfonic acid (PFHxS)                  | 355-46-4    | 0.01 | µg/L  | <0.01             | 1.57              | <0.01             | 3.01              | <0.01             |
| Perfluoroheptane sulfonic acid (PFHpS)                 | 375-92-8    | 0.02 | µg/L  | <0.02             | 0.14              | <0.02             | 0.05              | <0.02             |
| Perfluorooctane sulfonic acid (PFOS)                   | 1763-23-1   | 0.01 | µg/L  | <0.01             | 1.06              | <0.01             | 0.30              | <0.01             |
| Perfluorodecane sulfonic acid (PFDS)                   | 335-77-3    | 0.02 | µg/L  | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>         |             |      |       |                   |                   |                   |                   |                   |
| Perfluorobutanoic acid (PFBA)                          | 375-22-4    | 0.1  | µg/L  | <0.1              | <0.1              | <0.1              | 0.2               | <0.1              |
| Perfluoropentanoic acid (PFPeA)                        | 2706-90-3   | 0.02 | µg/L  | <0.02             | 0.11              | <0.02             | 0.30              | <0.02             |
| Perfluorohexanoic acid (PFHxA)                         | 307-24-4    | 0.02 | µg/L  | <0.02             | 0.28              | <0.02             | 1.18              | <0.02             |
| Perfluoroheptanoic acid (PFHpA)                        | 375-85-9    | 0.02 | µg/L  | <0.02             | 0.05              | <0.02             | 0.11              | <0.02             |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_MW114_220622 | 0960_MW233_220622 | 0960_MW113_220622 | 0960_MW162_220622 | 0960_MW139_220622 |
|------------------------------------------------------------|-------------|------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                       |             |      |      | 22-Jun-2022 09:52 | 22-Jun-2022 10:39 | 22-Jun-2022 11:04 | 22-Jun-2022 11:14 | 22-Jun-2022 12:26 |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2207731-006     | EP2207731-007     | EP2207731-008     | EP2207731-009     | EP2207731-010     |
|                                                            |             |      |      | Result            | Result            | Result            | Result            | Result            |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                   |                   |                   |                   |                   |
| Perfluorooctanoic acid (PFOA)                              | 335-67-1    | 0.01 | µg/L | <0.01             | 0.11              | <0.01             | 0.09              | <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             |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                   |                   |                   |                   |                   |
| Perfluorooctane sulfonamide (FOSA)                         | 754-91-6    | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)              | 31506-32-8  | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)               | 4151-50-2   | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)       | 24448-09-7  | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)        | 1691-99-2   | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)  | 2355-31-9   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)   | 2991-50-6   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                   |                   |                   |                   |                   |
| 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             |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_MW114_220622 | 0960_MW233_220622 | 0960_MW113_220622 | 0960_MW162_220622 | 0960_MW139_220622 |
|---------------------------------------------------------------|--------------------|------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                          |                    |      |      | 22-Jun-2022 09:52 | 22-Jun-2022 10:39 | 22-Jun-2022 11:04 | 22-Jun-2022 11:14 | 22-Jun-2022 12:26 |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2207731-006     | EP2207731-007     | EP2207731-008     | EP2207731-009     | EP2207731-010     |
|                                                               |                    |      |      | Result            | Result            | Result            | Result            | Result            |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                   |                   |                   |                   |                   |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                   |                   |                   |                   |                   |
| Sum of PFAS                                                   | ----               | 0.01 | µg/L | <0.01             | 3.55              | <0.01             | 6.26              | <0.01             |
| Sum of PFHxS and PFOS                                         | 355-46-4/1763-23-1 | 0.01 | µg/L | <0.01             | 2.63              | <0.01             | 3.31              | <0.01             |
| Sum of PFAS (WA DER List)                                     | ----               | 0.01 | µg/L | <0.01             | 3.28              | <0.01             | 5.71              | <0.01             |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 107               | 97.9              | 97.6              | 104               | 102               |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 102               | 95.7              | 102               | 102               | 99.6              |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                        |             |      |       | 0960_MW145_3-3.5_2<br>20622 | 0960_MW143_3-3.5_2<br>20622 | 0960_MW138_3-3.5_2<br>20622 | 0960_QC124_220622 | 0960_MW122_220622 |
|--------------------------------------------------------|-------------|------|-------|-----------------------------|-----------------------------|-----------------------------|-------------------|-------------------|
| Sampling date / time                                   |             |      |       | 22-Jun-2022 12:52           | 22-Jun-2022 13:13           | 22-Jun-2022 14:43           | 22-Jun-2022 15:37 | 22-Jun-2022 15:38 |
| Compound                                               | CAS Number  | LOR  | Unit  | EP2207731-011               | EP2207731-012               | EP2207731-013               | EP2207731-014     | EP2207731-015     |
|                                                        |             |      |       | Result                      | Result                      | Result                      | Result            | Result            |
| <b>ED037P: Alkalinity by PC Titrator</b>               |             |      |       |                             |                             |                             |                   |                   |
| Hydroxide Alkalinity as CaCO3                          | DMO-210-001 | 1    | mg/L  | <1                          | <1                          | <1                          | <1                | <1                |
| Carbonate Alkalinity as CaCO3                          | 3812-32-6   | 1    | mg/L  | <1                          | <1                          | <1                          | <1                | <1                |
| Bicarbonate Alkalinity as CaCO3                        | 71-52-3     | 1    | mg/L  | 130                         | 162                         | 268                         | 370               | 350               |
| Total Alkalinity as CaCO3                              | ----        | 1    | mg/L  | 130                         | 162                         | 268                         | 370               | 350               |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b> |             |      |       |                             |                             |                             |                   |                   |
| Sulfate as SO4 - Turbidimetric                         | 14808-79-8  | 1    | mg/L  | 5950                        | 5650                        | 2200                        | 1780              | 2220              |
| <b>ED045G: Chloride by Discrete Analyser</b>           |             |      |       |                             |                             |                             |                   |                   |
| Chloride                                               | 16887-00-6  | 1    | mg/L  | 43300                       | 38600                       | 16200                       | 15700             | 16600             |
| <b>ED093F: Dissolved Major Cations</b>                 |             |      |       |                             |                             |                             |                   |                   |
| Calcium                                                | 7440-70-2   | 1    | mg/L  | 1100                        | 1100                        | 485                         | 324               | 428               |
| Magnesium                                              | 7439-95-4   | 1    | mg/L  | 2940                        | 2680                        | 1070                        | 870               | 1130              |
| Sodium                                                 | 7440-23-5   | 1    | mg/L  | 23400                       | 21000                       | 8600                        | 8530              | 10200             |
| Potassium                                              | 7440-09-7   | 1    | mg/L  | 1120                        | 1030                        | 502                         | 514               | 575               |
| <b>EN055: Ionic Balance</b>                            |             |      |       |                             |                             |                             |                   |                   |
| ∅ Total Anions                                         | ----        | 0.01 | meq/L | 1350                        | 1210                        | 508                         | 487               | 521               |
| ∅ Total Cations                                        | ----        | 0.01 | meq/L | 1340                        | 1220                        | 499                         | 472               | 573               |
| ∅ Ionic Balance                                        | ----        | 0.01 | %     | 0.17                        | 0.23                        | 0.89                        | 1.60              | 4.68              |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>           |             |      |       |                             |                             |                             |                   |                   |
| 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                       | 0.10                        | <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                       | 0.44                        | <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             |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>         |             |      |       |                             |                             |                             |                   |                   |
| 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             |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

| Sub-Matrix: GROUNDWATER<br>(Matrix: WATER)                |             |      |      | Sample ID         | 0960_MW145_3-3.5_2<br>20622 | 0960_MW143_3-3.5_2<br>20622 | 0960_MW138_3-3.5_2<br>20622 | 0960_QC124_220622 | 0960_MW122_220622 |
|-----------------------------------------------------------|-------------|------|------|-------------------|-----------------------------|-----------------------------|-----------------------------|-------------------|-------------------|
| Sampling date / time                                      |             |      |      | 22-Jun-2022 12:52 | 22-Jun-2022 13:13           | 22-Jun-2022 14:43           | 22-Jun-2022 15:37           | 22-Jun-2022 15:38 |                   |
| Compound                                                  | CAS Number  | LOR  | Unit | EP2207731-011     | EP2207731-012               | EP2207731-013               | EP2207731-014               | EP2207731-015     |                   |
|                                                           |             |      |      | Result            | Result                      | Result                      | Result                      | Result            |                   |
| EP231B: Perfluoroalkyl Carboxylic Acids - Continued       |             |      |      |                   |                             |                             |                             |                   |                   |
| 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             |                   |
| 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             |                   |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_MW145_3-3.5_2<br>20622 | 0960_MW143_3-3.5_2<br>20622 | 0960_MW138_3-3.5_2<br>20622 | 0960_QC124_220622 | 0960_MW122_220622 |
|---------------------------------------------------------------|--------------------|------|------|-----------------------------|-----------------------------|-----------------------------|-------------------|-------------------|
| Sampling date / time                                          |                    |      |      | 22-Jun-2022 12:52           | 22-Jun-2022 13:13           | 22-Jun-2022 14:43           | 22-Jun-2022 15:37 | 22-Jun-2022 15:38 |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2207731-011               | EP2207731-012               | EP2207731-013               | EP2207731-014     | EP2207731-015     |
|                                                               |                    |      |      | Result                      | Result                      | Result                      | Result            | Result            |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                             |                             |                             |                   |                   |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05                       | <0.05                       | <0.05                       | <0.05             | <0.05             |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                             |                             |                             |                   |                   |
| Sum of PFAS                                                   | ----               | 0.01 | µg/L | <0.01                       | <0.01                       | <b>0.56</b>                 | <0.01             | <0.01             |
| Sum of PFHxS and PFOS                                         | 355-46-4/1763-23-1 | 0.01 | µg/L | <0.01                       | <0.01                       | <b>0.54</b>                 | <0.01             | <0.01             |
| Sum of PFAS (WA DER List)                                     | ----               | 0.01 | µg/L | <0.01                       | <0.01                       | <b>0.56</b>                 | <0.01             | <0.01             |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                             |                             |                             |                   |                   |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | <b>96.6</b>                 | <b>101</b>                  | <b>103</b>                  | <b>99.2</b>       | <b>97.8</b>       |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | <b>103</b>                  | <b>104</b>                  | <b>103</b>                  | <b>97.5</b>       | <b>103</b>        |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                        |             |      |       | 0960_MW146_3-3.5_2<br>20622 | 0960_MW144_3-3.5_2<br>20622 | ----  | ----  | ----  |
|--------------------------------------------------------|-------------|------|-------|-----------------------------|-----------------------------|-------|-------|-------|
| Sampling date / time                                   |             |      |       | 22-Jun-2022 16:06           | 22-Jun-2022 16:28           | ----  | ----  | ----  |
| Compound                                               | CAS Number  | LOR  | Unit  | EP2207731-016               | EP2207731-017               | ----- | ----- | ----- |
| Result                                                 |             |      |       | Result                      | Result                      | ----  | ----  | ----  |
| <b>ED037P: Alkalinity by PC Titrator</b>               |             |      |       |                             |                             |       |       |       |
| Hydroxide Alkalinity as CaCO3                          | DMO-210-001 | 1    | mg/L  | <1                          | <1                          | ----  | ----  | ----  |
| Carbonate Alkalinity as CaCO3                          | 3812-32-6   | 1    | mg/L  | <1                          | <1                          | ----  | ----  | ----  |
| Bicarbonate Alkalinity as CaCO3                        | 71-52-3     | 1    | mg/L  | 133                         | 207                         | ----  | ----  | ----  |
| Total Alkalinity as CaCO3                              | ----        | 1    | mg/L  | 133                         | 207                         | ----  | ----  | ----  |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b> |             |      |       |                             |                             |       |       |       |
| Sulfate as SO4 - Turbidimetric                         | 14808-79-8  | 1    | mg/L  | 6000                        | 3220                        | ----  | ----  | ----  |
| <b>ED045G: Chloride by Discrete Analyser</b>           |             |      |       |                             |                             |       |       |       |
| Chloride                                               | 16887-00-6  | 1    | mg/L  | 41800                       | 12800                       | ----  | ----  | ----  |
| <b>ED093F: Dissolved Major Cations</b>                 |             |      |       |                             |                             |       |       |       |
| Calcium                                                | 7440-70-2   | 1    | mg/L  | 1110                        | 773                         | ----  | ----  | ----  |
| Magnesium                                              | 7439-95-4   | 1    | mg/L  | 2910                        | 925                         | ----  | ----  | ----  |
| Sodium                                                 | 7440-23-5   | 1    | mg/L  | 23400                       | 6970                        | ----  | ----  | ----  |
| Potassium                                              | 7440-09-7   | 1    | mg/L  | 1130                        | 474                         | ----  | ----  | ----  |
| <b>EN055: Ionic Balance</b>                            |             |      |       |                             |                             |       |       |       |
| ∅ Total Anions                                         | ----        | 0.01 | meq/L | 1310                        | 432                         | ----  | ----  | ----  |
| ∅ Total Cations                                        | ----        | 0.01 | meq/L | 1340                        | 430                         | ----  | ----  | ----  |
| ∅ Ionic Balance                                        | ----        | 0.01 | %     | 1.32                        | 0.26                        | ----  | ----  | ----  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>           |             |      |       |                             |                             |       |       |       |
| 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                       | ----  | ----  | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>         |             |      |       |                             |                             |       |       |       |
| 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                       | ----  | ----  | ----  |





## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_MW146_3-3.5_2<br>20622 | 0960_MW144_3-3.5_2<br>20622 | ----  | ----  | ----  |
|------------------------------------------------------------|-------------|------|------|-----------------------------|-----------------------------|-------|-------|-------|
| Sampling date / time                                       |             |      |      | 22-Jun-2022 16:06           | 22-Jun-2022 16:28           | ----  | ----  | ----  |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2207731-016               | EP2207731-017               | ----- | ----- | ----- |
|                                                            |             |      |      | Result                      | Result                      | ----  | ----  | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                             |                             |       |       |       |
| 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 (PFTTrDA)                        | 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                       | ----  | ----  | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                             |                             |       |       |       |
| 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                       | ----  | ----  | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                             |                             |       |       |       |
| 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                       | ----  | ----  | ----  |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_MW146_3-3.5_2<br>20622 | 0960_MW144_3-3.5_2<br>20622 | ----  | ----  | ----  |
|---------------------------------------------------------------|--------------------|------|------|-----------------------------|-----------------------------|-------|-------|-------|
| Sampling date / time                                          |                    |      |      | 22-Jun-2022 16:06           | 22-Jun-2022 16:28           | ----  | ----  | ----  |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2207731-016               | EP2207731-017               | ----- | ----- | ----- |
| Result                                                        |                    |      |      | Result                      | Result                      | ----  | ----  | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                             |                             |       |       |       |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05                       | <0.05                       | ----  | ----  | ----  |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                             |                             |       |       |       |
| 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                       | ----  | ----  | ----  |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                             |                             |       |       |       |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 94.9                        | 94.3                        | ----  | ----  | ----  |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 102                         | 98.3                        | ----  | ----  | ----  |

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Work Order : EP2207731  
Client : STANTEC AUSTRALIA PTY LTD  
Project : WA\_0960\_PFASOMP



### Surrogate Control Limits

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

### Inter-Laboratory Testing

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

## QUALITY CONTROL REPORT

|                                |                                                           |                                |                                                                 |
|--------------------------------|-----------------------------------------------------------|--------------------------------|-----------------------------------------------------------------|
| <b>Work Order</b>              | <b>: EP2207731</b>                                        | <b>Page</b>                    | <b>: 1 of 8</b>                                                 |
| <b>Client</b>                  | <b>: STANTEC AUSTRALIA PTY LTD</b>                        | <b>Laboratory</b>              | <b>: Environmental Division Perth</b>                           |
| <b>Contact</b>                 | <b>: [REDACTED]</b>                                       | <b>Contact</b>                 | <b>: [REDACTED]</b>                                             |
| <b>Address</b>                 | <b>: GROUND FLOOR 226 ADELAIDE TERRACE<br/>PERTH 6000</b> | <b>Address</b>                 | <b>: 26 Rigali Way Wangara Western Australia Australia 6065</b> |
| <b>Telephone</b>               | <b>: ----</b>                                             | <b>Telephone</b>               | <b>: +6138549 9609</b>                                          |
| <b>Project</b>                 | <b>: WA_0960_PFASOMP</b>                                  | <b>Date Samples Received</b>   | <b>: 27-Jun-2022</b>                                            |
| <b>Order number</b>            | <b>: pfas-omp Learmonth</b>                               | <b>Date Analysis Commenced</b> | <b>: 29-Jun-2022</b>                                            |
| <b>C-O-C number</b>            | <b>: 39225</b>                                            | <b>Issue Date</b>              | <b>: 11-Jul-2022</b>                                            |
| <b>Sampler</b>                 | <b>: [REDACTED]</b>                                       |                                |                                                                 |
| <b>Site</b>                    | <b>: Learmonth GW - [REDACTED]</b>                        |                                |                                                                 |
| <b>Quote number</b>            | <b>: SY/139/19 B</b>                                      |                                |                                                                 |
| <b>No. of samples received</b> | <b>: 17</b>                                               |                                |                                                                 |
| <b>No. of samples analysed</b> | <b>: 17</b>                                               |                                |                                                                 |



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>                |
|--------------------|----------------------------|----------------------------------------------|
| Canhuang Ke        | Inorganics Supervisor      | Perth Inorganics, Wangara, Western Australia |
| [REDACTED]         | Laboratory Manager (Perth) | Perth Inorganics, Wangara, Western Australia |
| [REDACTED]         | LCMS Coordinator           | Sydney Organics, Smithfield, NSW             |



## 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**

| Sub-Matrix: WATER                                                 |                         |                                          |             | Laboratory Duplicate (DUP) Report |      |                 |                  |         |                    |
|-------------------------------------------------------------------|-------------------------|------------------------------------------|-------------|-----------------------------------|------|-----------------|------------------|---------|--------------------|
| Laboratory sample ID                                              | Sample ID               | Method: Compound                         | CAS Number  | LOR                               | Unit | Original Result | Duplicate Result | RPD (%) | Acceptable RPD (%) |
| ED037P: Alkalinity by PC Titrator (QC Lot: 4447989)               |                         |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207731-002                                                     | 0960_MW126_220622       | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                         | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                         | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 198             | 201              | 1.4     | 0% - 20%           |
|                                                                   |                         | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 198             | 201              | 1.4     | 0% - 20%           |
| EP2207731-012                                                     | 0960_MW143_3-3.5_220622 | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                         | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                         | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 162             | 162              | 0.0     | 0% - 20%           |
|                                                                   |                         | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 162             | 162              | 0.0     | 0% - 20%           |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4429725) |                         |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207731-001                                                     | 0960_MW127_220622       | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 2570            | 2580             | 0.5     | 0% - 20%           |
| EP2207731-011                                                     | 0960_MW145_3-3.5_220622 | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 5950            | 5910             | 0.7     | 0% - 20%           |
| ED045G: Chloride by Discrete Analyser (QC Lot: 4429724)           |                         |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207731-001                                                     | 0960_MW127_220622       | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 24000           | 23900            | 0.4     | 0% - 20%           |
| EP2207731-011                                                     | 0960_MW145_3-3.5_220622 | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 43300           | 42000            | 3.0     | 0% - 20%           |
| ED093F: Dissolved Major Cations (QC Lot: 4428392)                 |                         |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207731-001                                                     | 0960_MW127_220622       | ED093F: Calcium                          | 7440-70-2   | 1                                 | mg/L | 1070            | 1050             | 2.2     | 0% - 20%           |
|                                                                   |                         | ED093F: Magnesium                        | 7439-95-4   | 1                                 | mg/L | 1630            | 1590             | 2.3     | 0% - 20%           |
|                                                                   |                         | ED093F: Sodium                           | 7440-23-5   | 1                                 | mg/L | 13900           | 13700            | 1.4     | 0% - 20%           |
|                                                                   |                         | ED093F: Potassium                        | 7440-09-7   | 1                                 | mg/L | 548             | 531              | 3.2     | 0% - 20%           |
| EP2207731-011                                                     | 0960_MW145_3-3.5_220622 | ED093F: Calcium                          | 7440-70-2   | 1                                 | mg/L | 1100            | 1060             | 3.4     | 0% - 20%           |

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 Work Order : EP2207731  
 Client : STANTEC AUSTRALIA PTY LTD  
 Project : WA\_0960\_PFASOMP



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 (%) |
| ED093F: Dissolved Major Cations (QC Lot: 4428392) - continued |                         |                                                |                   |                                       |          |                 |                  |         |                    |
| EP2207731-011                                                 | 0960_MW145_3-3.5_220622 | ED093F: Magnesium                              | 7439-95-4         | 1                                     | mg/L     | 2940            | 2880             | 2.2     | 0% - 20%           |
|                                                               |                         | ED093F: Sodium                                 | 7440-23-5         | 1                                     | mg/L     | 23400           | 22900            | 2.5     | 0% - 20%           |
|                                                               |                         | ED093F: Potassium                              | 7440-09-7         | 1                                     | mg/L     | 1120            | 1110             | 0.7     | 0% - 20%           |
| EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4438736)       |                         |                                                |                   |                                       |          |                 |                  |         |                    |
| EP2207731-006                                                 | 0960_MW114_220622       | 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           |
| EP2207731-015                                                 | 0960_MW122_220622       | 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: 4438736)     |                         |                                                |                   |                                       |          |                 |                  |         |                    |
| EP2207731-006                                                 | 0960_MW114_220622       | 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           |
|                                                               |                         | EP2207731-015                                  | 0960_MW122_220622 | EP231X: Perfluorooctanoic acid (PFOA) | 335-67-1 | 0.01            | µg/L             | <0.01   | <0.01              |
| 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           |



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 (%) |
| EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4438736)        |                   |                                                                   |             |                                   |      |                 |                  |         |                    |
| EP2207731-006                                                | 0960_MW114_220622 | 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           |
| EP2207731-015                                                | 0960_MW122_220622 | 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: 4438736) |                   |                                                                   |             |                                   |      |                 |                  |         |                    |
| EP2207731-006                                                | 0960_MW114_220622 | 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           |
| EP2207731-015                                                | 0960_MW122_220622 | 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: 4438736) - continued |                   |                                                     |             |                                   |      |                 |                  |         |                    |
| EP2207731-015                                                            | 0960_MW122_220622 | 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: 4438736)                                      |                   |                                                     |             |                                   |      |                 |                  |         |                    |
| EP2207731-006                                                            | 0960_MW114_220622 | EP231X: Sum of PFAS                                 | ----        | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
| EP2207731-015                                                            | 0960_MW122_220622 | EP231X: Sum of PFAS                                 | ----        | 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**

| Sub-Matrix: WATER                                                |             |      |      | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |      |
|------------------------------------------------------------------|-------------|------|------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|------|
|                                                                  |             |      |      |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |      |
| Method: Compound                                                 | CAS Number  | LOR  | Unit | Result                      |                                       |                           |                                   |      |
| ED037P: Alkalinity by PC Titrator (QCLot: 4447989)               |             |      |      |                             |                                       |                           |                                   |      |
| ED037-P: Hydroxide Alkalinity as CaCO3                           | DMO-210-001 | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Carbonate Alkalinity as CaCO3                           | 3812-32-6   | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Bicarbonate Alkalinity as CaCO3                         | 71-52-3     | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Total Alkalinity as CaCO3                               | ----        | 1    | mg/L | <1                          | 20 mg/L                               | 107                       | 87.8                              | 118  |
|                                                                  |             |      |      | <1                          | 200 mg/L                              | 97.4                      | 87.8                              | 118  |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4429725) |             |      |      |                             |                                       |                           |                                   |      |
| ED041G: Sulfate as SO4 - Turbidimetric                           | 14808-79-8  | 1    | mg/L | <1                          | 25 mg/L                               | 100                       | 89.9                              | 112  |
|                                                                  |             |      |      | <1                          | 500 mg/L                              | 102                       | 89.9                              | 112  |
| ED045G: Chloride by Discrete Analyser (QCLot: 4429724)           |             |      |      |                             |                                       |                           |                                   |      |
| ED045G: Chloride                                                 | 16887-00-6  | 1    | mg/L | <1                          | 10 mg/L                               | 103                       | 88.6                              | 113  |
|                                                                  |             |      |      | <1                          | 1000 mg/L                             | 102                       | 88.6                              | 113  |
| ED093F: Dissolved Major Cations (QCLot: 4428392)                 |             |      |      |                             |                                       |                           |                                   |      |
| ED093F: Calcium                                                  | 7440-70-2   | 1    | mg/L | <1                          | 50 mg/L                               | 97.2                      | 86.5                              | 117  |
| ED093F: Magnesium                                                | 7439-95-4   | 1    | mg/L | <1                          | 50 mg/L                               | 99.1                      | 88.4                              | 110  |
| ED093F: Sodium                                                   | 7440-23-5   | 1    | mg/L | <1                          | 50 mg/L                               | 109                       | 91.4                              | 113  |
| ED093F: Potassium                                                | 7440-09-7   | 1    | mg/L | <1                          | 50 mg/L                               | 93.9                      | 84.6                              | 108  |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4438736)           |             |      |      |                             |                                       |                           |                                   |      |
| EP231X: Perfluorobutane sulfonic acid (PFBS)                     | 375-73-5    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 126                       | 72.0                              | 130  |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)                   | 2706-91-4   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 118                       | 71.0                              | 127  |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)                    | 355-46-4    | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 113                       | 68.0                              | 131  |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)                   | 375-92-8    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 129                       | 69.0                              | 134  |
| EP231X: Perfluorooctane sulfonic acid (PFOS)                     | 1763-23-1   | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 127                       | 65.0                              | 140  |
| EP231X: Perfluorodecane sulfonic acid (PFDS)                     | 335-77-3    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 126                       | 53.0                              | 142  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4438736)         |             |      |      |                             |                                       |                           |                                   |      |
| 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                             | 128                       | 72.0                              | 129  |
| EP231X: Perfluorohexanoic acid (PFHxA)                           | 307-24-4    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 122                       | 72.0                              | 129  |
| EP231X: Perfluoroheptanoic acid (PFHpA)                          | 375-85-9    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 117                       | 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                             | 122                       | 69.0                              | 130  |
| EP231X: Perfluorodecanoic acid (PFDA)                            | 335-76-2    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 113                       | 71.0                              | 129  |
| EP231X: Perfluoroundecanoic acid (PFUnDA)                        | 2058-94-8   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 120                       | 69.0                              | 133  |
| EP231X: Perfluorododecanoic acid (PFDoDA)                        | 307-55-1    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 120                       | 72.0                              | 134  |



Sub-Matrix: **WATER**

| Sub-Matrix: WATER                                                    |             |      |      | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |     |
|----------------------------------------------------------------------|-------------|------|------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|-----|
|                                                                      |             |      |      |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |     |
| Method: Compound                                                     | CAS Number  | LOR  | Unit | Result                      |                                       |                           |                                   |     |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4438736) - continued |             |      |      |                             |                                       |                           |                                   |     |
| EP231X: Perfluorotridecanoic acid (PFTrDA)                           | 72629-94-8  | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 137                       | 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: 4438736)                 |             |      |      |                             |                                       |                           |                                   |     |
| EP231X: Perfluorooctane sulfonamide (FOSA)                           | 754-91-6    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 132                       | 67.0                              | 137 |
| EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)                | 31506-32-8  | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 132                       | 68.0                              | 141 |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)                 | 4151-50-2   | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 135                       | 62.6                              | 147 |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)         | 24448-09-7  | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 115                       | 66.0                              | 145 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)          | 1691-99-2   | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 120                       | 57.6                              | 145 |
| EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)    | 2355-31-9   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 120                       | 65.0                              | 136 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)     | 2991-50-6   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 119                       | 61.0                              | 135 |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4438736)          |             |      |      |                             |                                       |                           |                                   |     |
| EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                    | 757124-72-4 | 0.05 | µg/L | <0.05                       | 0.25 µg/L                             | 126                       | 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                             | 127                       | 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                             | 138                       | 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                             | 137                       | 71.4                              | 144 |

## Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

|                                                                         |                   |                                                |            | Matrix Spike (MS) Report |                        |                       |      |
|-------------------------------------------------------------------------|-------------------|------------------------------------------------|------------|--------------------------|------------------------|-----------------------|------|
|                                                                         |                   |                                                |            | Spike<br>Concentration   | SpikeRecovery(%)<br>MS | Acceptable Limits (%) |      |
| Laboratory sample ID                                                    | Sample ID         | Method: Compound                               | CAS Number |                          |                        | Low                   | High |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4429725)</b> |                   |                                                |            |                          |                        |                       |      |
| EP2207731-001                                                           | 0960_MW127_220622 | ED041G: Sulfate as SO4 - Turbidimetric         | 14808-79-8 | 100 mg/L                 | # Not Determined       | 70.4                  | 130  |
| <b>ED045G: Chloride by Discrete Analyser (QCLot: 4429724)</b>           |                   |                                                |            |                          |                        |                       |      |
| EP2207731-001                                                           | 0960_MW127_220622 | ED045G: Chloride                               | 16887-00-6 | 1000 mg/L                | # Not Determined       | 70.0                  | 130  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4438736)</b>           |                   |                                                |            |                          |                        |                       |      |
| EP2207731-010                                                           | 0960_MW139_220622 | EP231X: Perfluorobutane sulfonic acid (PFBS)   | 375-73-5   | 0.25 µg/L                | 121                    | 72.0                  | 130  |
|                                                                         |                   | EP231X: Perfluoropentane sulfonic acid (PFPeS) | 2706-91-4  | 0.25 µg/L                | 126                    | 71.0                  | 127  |
|                                                                         |                   | EP231X: Perfluorohexane sulfonic acid (PFHxS)  | 355-46-4   | 0.25 µg/L                | 127                    | 68.0                  | 131  |
|                                                                         |                   | EP231X: Perfluoroheptane sulfonic acid (PFHpS) | 375-92-8   | 0.25 µg/L                | 122                    | 69.0                  | 134  |



Sub-Matrix: **WATER**

| 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: 4438736) - continued |                   |                                                                   |             |                          |                  |                       |      |
| EP2207731-010                                                      | 0960_MW139_220622 | EP231X: Perfluorooctane sulfonic acid (PFOS)                      | 1763-23-1   | 0.25 µg/L                | 113              | 65.0                  | 140  |
|                                                                    |                   | EP231X: Perfluorodecane sulfonic acid (PFDS)                      | 335-77-3    | 0.25 µg/L                | 98.4             | 53.0                  | 142  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4438736)           |                   |                                                                   |             |                          |                  |                       |      |
| EP2207731-010                                                      | 0960_MW139_220622 | EP231X: Perfluorobutanoic acid (PFBA)                             | 375-22-4    | 1.25 µg/L                | 96.9             | 73.0                  | 129  |
|                                                                    |                   | EP231X: Perfluoropentanoic acid (PFPeA)                           | 2706-90-3   | 0.25 µg/L                | 124              | 72.0                  | 129  |
|                                                                    |                   | EP231X: Perfluorohexanoic acid (PFHxA)                            | 307-24-4    | 0.25 µg/L                | 126              | 72.0                  | 129  |
|                                                                    |                   | EP231X: Perfluoroheptanoic acid (PFHpA)                           | 375-85-9    | 0.25 µg/L                | 128              | 72.0                  | 130  |
|                                                                    |                   | EP231X: Perfluorooctanoic acid (PFOA)                             | 335-67-1    | 0.25 µg/L                | 128              | 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                | 128              | 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                | 131              | 72.0                  | 134  |
|                                                                    |                   | EP231X: Perfluorotridecanoic acid (PFTrDA)                        | 72629-94-8  | 0.25 µg/L                | 128              | 65.0                  | 144  |
|                                                                    |                   | EP231X: Perfluorotetradecanoic acid (PFTeDA)                      | 376-06-7    | 0.625 µg/L               | 118              | 71.0                  | 132  |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4438736)               |                   |                                                                   |             |                          |                  |                       |      |
| EP2207731-010                                                      | 0960_MW139_220622 | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.25 µg/L                | 131              | 67.0                  | 137  |
|                                                                    |                   | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.625 µg/L               | 126              | 68.0                  | 141  |
|                                                                    |                   | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.625 µg/L               | 101              | 62.6                  | 147  |
|                                                                    |                   | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.625 µg/L               | 106              | 66.0                  | 145  |
|                                                                    |                   | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.625 µg/L               | 116              | 57.6                  | 145  |
|                                                                    |                   | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9   | 0.25 µg/L                | 131              | 65.0                  | 136  |
|                                                                    |                   | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.25 µg/L                | 98.2             | 61.0                  | 135  |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4438736)        |                   |                                                                   |             |                          |                  |                       |      |
| EP2207731-010                                                      | 0960_MW139_220622 | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.25 µg/L                | 101              | 63.0                  | 143  |
|                                                                    |                   | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 27619-97-2  | 0.25 µg/L                | 120              | 64.0                  | 140  |
|                                                                    |                   | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | 39108-34-4  | 0.25 µg/L                | 117              | 67.0                  | 138  |
|                                                                    |                   | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | 120226-60-0 | 0.25 µg/L                | 117              | 71.4                  | 144  |

## QA/QC Compliance Assessment to assist with Quality Review

|              |                             |                         |                                |
|--------------|-----------------------------|-------------------------|--------------------------------|
| Work Order   | : EP2207731                 | Page                    | : 1 of 7                       |
| Client       | : STANTEC AUSTRALIA PTY LTD | Laboratory              | : Environmental Division Perth |
| Contact      | : [REDACTED]                | Telephone               | : +6138549 9609                |
| Project      | : WA_0960_PFASOMP           | Date Samples Received   | : 27-Jun-2022                  |
| Site         | : Learmonth GW - [REDACTED] | Issue Date              | : 11-Jul-2022                  |
| Sampler      | : [REDACTED]                | No. of samples received | : 17                           |
| Order number | : pfas-omp Learmonth        | No. of samples analysed | : 17                           |

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

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

### Summary of Outliers

#### Outliers : Quality Control Samples

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

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

#### Outliers : Analysis Holding Time Compliance

- Analysis Holding Time Outliers exist - please see following pages for full details.

#### Outliers : Frequency of Quality Control Samples

- **NO** Quality Control Sample Frequency Outliers exist.

Page : 2 of 7  
 Work Order : EP2207731  
 Client : STANTEC AUSTRALIA PTY LTD  
 Project : WA\_0960\_PFASOMP



### 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                                                                               |
|-------------------------------------------------------------|----------------------|-------------------|--------------------------------------------|------------|----------------|--------|---------------------------------------------------------------------------------------|
| <b>Matrix Spike (MS) Recoveries</b>                         |                      |                   |                                            |            |                |        |                                                                                       |
| ED041G: Sulfate (Turbidimetric) as SO <sub>4</sub> 2- by DA | EP2207731--001       | 0960_MW127_220622 | Sulfate as SO <sub>4</sub> - Turbidimetric | 14808-79-8 | Not Determined | ----   | MS recovery not determined, background level greater than or equal to 4x spike level. |
| ED045G: Chloride by Discrete Analyser                       | EP2207731--001       | 0960_MW127_220622 | Chloride                                   | 16887-00-6 | Not Determined | ----   | MS recovery not determined, background level greater than or equal to 4x spike level. |

### Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

| Method                                   |                          | Extraction / Preparation |                    |              | Analysis      |                  |              |
|------------------------------------------|--------------------------|--------------------------|--------------------|--------------|---------------|------------------|--------------|
| Container / Client Sample ID(s)          |                          | Date extracted           | Due for extraction | Days overdue | Date analysed | Due for analysis | Days overdue |
| <b>ED037P: Alkalinity by PC Titrator</b> |                          |                          |                    |              |               |                  |              |
| <b>Clear Plastic Bottle - Natural</b>    |                          |                          |                    |              |               |                  |              |
| 0960_MW127_220622,                       | 0960_MW126_220622,       | ----                     | ----               | ----         | 08-Jul-2022   | 06-Jul-2022      | 2            |
| 0960_MW021_220622,                       | 0960_MW018_220622,       |                          |                    |              |               |                  |              |
| 0960_QC117_220622,                       | 0960_MW114_220622,       |                          |                    |              |               |                  |              |
| 0960_MW233_220622,                       | 0960_MW113_220622,       |                          |                    |              |               |                  |              |
| 0960_MW162_220622,                       | 0960_MW139_220622,       |                          |                    |              |               |                  |              |
| 0960_MW145_3-3.5_220622,                 | 0960_MW143_3-3.5_220622, |                          |                    |              |               |                  |              |
| 0960_MW138_3-3.5_220622,                 | 0960_QC124_220622,       |                          |                    |              |               |                  |              |
| 0960_MW122_220622,                       | 0960_MW146_3-3.5_220622, |                          |                    |              |               |                  |              |
| 0960_MW144_3-3.5_220622                  |                          |                          |                    |              |               |                  |              |

### Analysis Holding Time Compliance

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

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

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

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

Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

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



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                                                                                                                                                                                              | Sample Date                                                                                                                                                                              | Extraction / Preparation |                    |            | Analysis      |                  |             |   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------|------------|---------------|------------------|-------------|---|
| Container / Client Sample ID(s)                                                                                                                                                                                     |                                                                                                                                                                                          | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation  |   |
| ED037P: Alkalinity by PC Titrator                                                                                                                                                                                   |                                                                                                                                                                                          |                          |                    |            |               |                  |             |   |
| Clear Plastic Bottle - Natural (ED037-P)                                                                                                                                                                            |                                                                                                                                                                                          |                          |                    |            |               |                  |             |   |
| 0960_MW127_220622,<br>0960_MW021_220622,<br>0960_QC117_220622,<br>0960_MW233_220622,<br>0960_MW162_220622,<br>0960_MW145_3-3.5_220622,<br>0960_MW138_3-3.5_220622,<br>0960_MW122_220622,<br>0960_MW144_3-3.5_220622 | 0960_MW126_220622,<br>0960_MW018_220622,<br>0960_MW114_220622,<br>0960_MW113_220622,<br>0960_MW139_220622,<br>0960_MW143_3-3.5_220622,<br>0960_QC124_220622,<br>0960_MW146_3-3.5_220622, | 22-Jun-2022              | ----               | ----       | ----          | 08-Jul-2022      | 06-Jul-2022 | ✘ |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA                                                                                                                                                                     |                                                                                                                                                                                          |                          |                    |            |               |                  |             |   |
| Clear Plastic Bottle - Natural (ED041G)                                                                                                                                                                             |                                                                                                                                                                                          |                          |                    |            |               |                  |             |   |
| 0960_MW127_220622,<br>0960_MW021_220622,<br>0960_QC117_220622,<br>0960_MW233_220622,<br>0960_MW162_220622,<br>0960_MW145_3-3.5_220622,<br>0960_MW138_3-3.5_220622,<br>0960_MW122_220622,<br>0960_MW144_3-3.5_220622 | 0960_MW126_220622,<br>0960_MW018_220622,<br>0960_MW114_220622,<br>0960_MW113_220622,<br>0960_MW139_220622,<br>0960_MW143_3-3.5_220622,<br>0960_QC124_220622,<br>0960_MW146_3-3.5_220622, | 22-Jun-2022              | ----               | ----       | ----          | 08-Jul-2022      | 20-Jul-2022 | ✔ |
| ED045G: Chloride by Discrete Analyser                                                                                                                                                                               |                                                                                                                                                                                          |                          |                    |            |               |                  |             |   |
| Clear Plastic Bottle - Natural (ED045G)                                                                                                                                                                             |                                                                                                                                                                                          |                          |                    |            |               |                  |             |   |
| 0960_MW127_220622,<br>0960_MW021_220622,<br>0960_QC117_220622,<br>0960_MW233_220622,<br>0960_MW162_220622,<br>0960_MW145_3-3.5_220622,<br>0960_MW138_3-3.5_220622,<br>0960_MW122_220622,<br>0960_MW144_3-3.5_220622 | 0960_MW126_220622,<br>0960_MW018_220622,<br>0960_MW114_220622,<br>0960_MW113_220622,<br>0960_MW139_220622,<br>0960_MW143_3-3.5_220622,<br>0960_QC124_220622,<br>0960_MW146_3-3.5_220622, | 22-Jun-2022              | ----               | ----       | ----          | 08-Jul-2022      | 20-Jul-2022 | ✔ |





Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                  | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |                          |
|-----------------------------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|--------------------------|
| Container / Client Sample ID(s)         |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |                          |
| ED093F: Dissolved Major Cations         |             |                          |                    |            |               |                  |            |                          |
| Clear Plastic Bottle - Natural (ED093F) | 22-Jun-2022 | ----                     | ----               | ----       | 29-Jun-2022   | 29-Jun-2022      | ✔          |                          |
| 0960_MW127_220622,                      |             |                          |                    |            |               |                  |            | 0960_MW126_220622,       |
| 0960_MW021_220622,                      |             |                          |                    |            |               |                  |            | 0960_MW018_220622,       |
| 0960_QC117_220622,                      |             |                          |                    |            |               |                  |            | 0960_MW114_220622,       |
| 0960_MW233_220622,                      |             |                          |                    |            |               |                  |            | 0960_MW113_220622,       |
| 0960_MW162_220622,                      |             |                          |                    |            |               |                  |            | 0960_MW139_220622,       |
| 0960_MW145_3-3.5_220622,                |             |                          |                    |            |               |                  |            | 0960_MW143_3-3.5_220622, |
| 0960_MW138_3-3.5_220622,                |             |                          |                    |            |               |                  |            | 0960_QC124_220622,       |
| 0960_MW122_220622,                      |             |                          |                    |            |               |                  |            | 0960_MW146_3-3.5_220622, |
| 0960_MW144_3-3.5_220622                 |             |                          |                    |            |               |                  |            |                          |
| EP231A: Perfluoroalkyl Sulfonic Acids   |             |                          |                    |            |               |                  |            |                          |
| HDPE (no PTFE) (EP231X)                 | 22-Jun-2022 | 05-Jul-2022              | 19-Dec-2022        | ✔          | 07-Jul-2022   | 19-Dec-2022      | ✔          |                          |
| 0960_MW127_220622,                      |             |                          |                    |            |               |                  |            | 0960_MW126_220622,       |
| 0960_MW021_220622,                      |             |                          |                    |            |               |                  |            | 0960_MW018_220622,       |
| 0960_QC117_220622,                      |             |                          |                    |            |               |                  |            | 0960_MW114_220622,       |
| 0960_MW233_220622,                      |             |                          |                    |            |               |                  |            | 0960_MW113_220622,       |
| 0960_MW162_220622,                      |             |                          |                    |            |               |                  |            | 0960_MW139_220622,       |
| 0960_MW145_3-3.5_220622,                |             |                          |                    |            |               |                  |            | 0960_MW143_3-3.5_220622, |
| 0960_MW138_3-3.5_220622,                |             |                          |                    |            |               |                  |            | 0960_QC124_220622,       |
| 0960_MW122_220622,                      |             |                          |                    |            |               |                  |            | 0960_MW146_3-3.5_220622, |
| 0960_MW144_3-3.5_220622                 |             |                          |                    |            |               |                  |            |                          |
| EP231B: Perfluoroalkyl Carboxylic Acids |             |                          |                    |            |               |                  |            |                          |
| HDPE (no PTFE) (EP231X)                 | 22-Jun-2022 | 05-Jul-2022              | 19-Dec-2022        | ✔          | 07-Jul-2022   | 19-Dec-2022      | ✔          |                          |
| 0960_MW127_220622,                      |             |                          |                    |            |               |                  |            | 0960_MW126_220622,       |
| 0960_MW021_220622,                      |             |                          |                    |            |               |                  |            | 0960_MW018_220622,       |
| 0960_QC117_220622,                      |             |                          |                    |            |               |                  |            | 0960_MW114_220622,       |
| 0960_MW233_220622,                      |             |                          |                    |            |               |                  |            | 0960_MW113_220622,       |
| 0960_MW162_220622,                      |             |                          |                    |            |               |                  |            | 0960_MW139_220622,       |
| 0960_MW145_3-3.5_220622,                |             |                          |                    |            |               |                  |            | 0960_MW143_3-3.5_220622, |
| 0960_MW138_3-3.5_220622,                |             |                          |                    |            |               |                  |            | 0960_QC124_220622,       |
| 0960_MW122_220622,                      |             |                          |                    |            |               |                  |            | 0960_MW146_3-3.5_220622, |
| 0960_MW144_3-3.5_220622                 |             |                          |                    |            |               |                  |            |                          |

Page : 5 of 7  
 Work Order : EP2207731  
 Client : STANTEC AUSTRALIA PTY LTD  
 Project : WA\_0960\_PFASOMP



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                     |                          | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |
|--------------------------------------------|--------------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|
| Container / Client Sample ID(s)            |                          |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| EP231C: Perfluoroalkyl Sulfonamides        |                          |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                    |                          | 22-Jun-2022 | 05-Jul-2022              | 19-Dec-2022        | ✔          | 07-Jul-2022   | 19-Dec-2022      | ✔          |
| 0960_MW127_220622,                         | 0960_MW126_220622,       |             |                          |                    |            |               |                  |            |
| 0960_MW021_220622,                         | 0960_MW018_220622,       |             |                          |                    |            |               |                  |            |
| 0960_QC117_220622,                         | 0960_MW114_220622,       |             |                          |                    |            |               |                  |            |
| 0960_MW233_220622,                         | 0960_MW113_220622,       |             |                          |                    |            |               |                  |            |
| 0960_MW162_220622,                         | 0960_MW139_220622,       |             |                          |                    |            |               |                  |            |
| 0960_MW145_3-3.5_220622,                   | 0960_MW143_3-3.5_220622, |             |                          |                    |            |               |                  |            |
| 0960_MW138_3-3.5_220622,                   | 0960_QC124_220622,       |             |                          |                    |            |               |                  |            |
| 0960_MW122_220622,                         | 0960_MW146_3-3.5_220622, |             |                          |                    |            |               |                  |            |
| 0960_MW144_3-3.5_220622                    |                          |             |                          |                    |            |               |                  |            |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids |                          |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                    |                          | 22-Jun-2022 | 05-Jul-2022              | 19-Dec-2022        | ✔          | 07-Jul-2022   | 19-Dec-2022      | ✔          |
| 0960_MW127_220622,                         | 0960_MW126_220622,       |             |                          |                    |            |               |                  |            |
| 0960_MW021_220622,                         | 0960_MW018_220622,       |             |                          |                    |            |               |                  |            |
| 0960_QC117_220622,                         | 0960_MW114_220622,       |             |                          |                    |            |               |                  |            |
| 0960_MW233_220622,                         | 0960_MW113_220622,       |             |                          |                    |            |               |                  |            |
| 0960_MW162_220622,                         | 0960_MW139_220622,       |             |                          |                    |            |               |                  |            |
| 0960_MW145_3-3.5_220622,                   | 0960_MW143_3-3.5_220622, |             |                          |                    |            |               |                  |            |
| 0960_MW138_3-3.5_220622,                   | 0960_QC124_220622,       |             |                          |                    |            |               |                  |            |
| 0960_MW122_220622,                         | 0960_MW146_3-3.5_220622, |             |                          |                    |            |               |                  |            |
| 0960_MW144_3-3.5_220622                    |                          |             |                          |                    |            |               |                  |            |
| EP231P: PFAS Sums                          |                          |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                    |                          | 22-Jun-2022 | 05-Jul-2022              | 19-Dec-2022        | ✔          | 07-Jul-2022   | 19-Dec-2022      | ✔          |
| 0960_MW127_220622,                         | 0960_MW126_220622,       |             |                          |                    |            |               |                  |            |
| 0960_MW021_220622,                         | 0960_MW018_220622,       |             |                          |                    |            |               |                  |            |
| 0960_QC117_220622,                         | 0960_MW114_220622,       |             |                          |                    |            |               |                  |            |
| 0960_MW233_220622,                         | 0960_MW113_220622,       |             |                          |                    |            |               |                  |            |
| 0960_MW162_220622,                         | 0960_MW139_220622,       |             |                          |                    |            |               |                  |            |
| 0960_MW145_3-3.5_220622,                   | 0960_MW143_3-3.5_220622, |             |                          |                    |            |               |                  |            |
| 0960_MW138_3-3.5_220622,                   | 0960_QC124_220622,       |             |                          |                    |            |               |                  |            |
| 0960_MW122_220622,                         | 0960_MW146_3-3.5_220622, |             |                          |                    |            |               |                  |            |
| 0960_MW144_3-3.5_220622                    |                          |             |                          |                    |            |               |                  |            |



## Quality Control Parameter Frequency Compliance

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

Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

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



## Brief Method Summaries

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

| Analytical Methods                                                 | Method       | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------------------|--------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alkalinity by Auto Titrator                                        | ED037-P      | WATER  | In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                                                                                                                                                                                                                |
| Sulfate (Turbidimetric) as SO <sub>4</sub> 2- by Discrete Analyser | ED041G       | WATER  | In house: Referenced to APHA 4500-SO <sub>4</sub> . Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO <sub>4</sub> suspension is measured by a photometer and the SO <sub>4</sub> -2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                         |
| Chloride by Discrete Analyser                                      | ED045G       | WATER  | In house: Referenced to APHA 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm.                                                                                                                                                                                                                                                                                                                                                                |
| Major Cations - Dissolved                                          | ED093F       | WATER  | In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                           |
| Ionic Balance by PCT DA and Turbi SO <sub>4</sub> DA               | * EN055 - PG | WATER  | In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS               | EP231X       | WATER  | In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements. |
| Preparation Methods                                                | Method       | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Solid Phase Extraction (SPE) for PFAS in water                     | ORG72        | WATER  | In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.                                                                                                                                                                                                |



# CHAIN OF CUSTODY

COC#: 39227

ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: Learmonth SW/OTH - SC

ORDER NO: pfas-omp Learmonth

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:

## SAMPLE DETAILS

## ANALYSIS REQUIRED

| SAMPLE | NAME         | DESCRIPTION | DATE / TIME         | MATRIX | TOTAL BOTTLES        | ON HOLD | Surface Waters WATER | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|--------------|-------------|---------------------|--------|----------------------|---------|----------------------|----------------------|------------------------|
| 001    | 0960_SW200 ✓ |             | 22/06/2022 12:02 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8          |                      |                        |
| 002    | 0960_SW199 ✓ |             | 22/06/2022 12:30 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8          |                      |                        |
| 003    | 0960_SW227   |             | 22/06/2022 03:05 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8          |                      |                        |



# CHAIN OF CUSTODY

COC#: 39227

ALS Laboratory: EP Perth

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: Learmonth SW/OTH - SC

ORDER NO: pfas-omp Learmonth

PROJECT MANAGER

PRIMARY SAMPLE

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 | PARTIAL ANALYSIS GROUP NAME | MATRIX | SELECTED ANALYSIS NAME                                                                                                                                                                                      |
|--------|-------------|-----------------------------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 001    | 0960_SW200  | Surface Waters WATER        | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 002    | 0960_SW199  | Surface Waters WATER        | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 003    | 0960_SW227  | Surface Waters WATER        | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |



# CHAIN OF CUSTODY

ALS COC#: 39227

ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: Learmonth SW/OTH - SC

ORDER NO: pfas-omp Learmonth

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:

| SAMPLE | SAMPLE NAME | BOTTLE NAME                    | VOLUME | BARCODE        | TYPE  | FILTERED | REASON |
|--------|-------------|--------------------------------|--------|----------------|-------|----------|--------|
| 001    | 0960_SW200  | HDPE (no PTFE)                 | 20 mL  | 00352101038026 | Grey  | No       |        |
| 001    | 0960_SW200  | HDPE (no PTFE)                 | 20 mL  | 00352101071537 | Grey  | No       |        |
| 001    | 0960_SW200  | Clear Plastic Bottle - Natural | 500 mL | 00070621191236 | Green | No       |        |
| 002    | 0960_SW199  | Clear Plastic Bottle - Natural | 500 mL | 00070621191204 | Green | No       |        |
| 002    | 0960_SW199  | HDPE (no PTFE)                 | 20 mL  | 00352101071370 | Grey  | No       |        |
| 002    | 0960_SW199  | HDPE (no PTFE)                 | 20 mL  | 00352101071575 | Grey  | No       |        |
| 003    | 0960_SW227  | HDPE (no PTFE)                 | 20 mL  | 00352101071806 | Grey  | No       |        |
| 003    | 0960_SW227  | HDPE (no PTFE)                 | 20 mL  | 00352101071781 | Grey  | No       |        |
| 003    | 0960_SW227  | Clear Plastic Bottle - Natural | 500 mL | 00070621191240 | Green | No       |        |

Total Bottle Count: ALS: 9, Non ALS: 0



**SAMPLE RECEIPT NOTIFICATION (SRN)****Work Order : EP2207732**

Client : **STANTEC AUSTRALIA PTY LTD**  
Contact : [REDACTED]  
Address : GROUND FLOOR 226 ADELAIDE  
TERRACE  
PERTH 6000

Laboratory : Environmental Division Perth  
Contact : [REDACTED]  
Address : 26 Rigali Way Wangara Western  
Australia Australia 6065

E-mail : [REDACTED]@stantec.com  
Telephone : ----  
Facsimile : ----

E-mail : [REDACTED]@alsglobal.com  
Telephone : +6138549 9609  
Facsimile : +61-8-9406 1399

Project : WA\_0960\_PFASOMP  
Order number : pfas-omp Learmonth  
C-O-C number : 39227  
Site : Learmonth SW/OTH - [REDACTED]  
Sampler : [REDACTED]

Page : 1 of 2  
Quote number : ES2022MWHAUS0002 (SY/139/19 B)  
QC Level : NEPM 2013 B3 & ALS QC Standard

**Dates**

Date Samples Received : 27-Jun-2022 11:40  
Client Requested Due : 08-Jul-2022  
Date

Issue Date : 28-Jun-2022  
Scheduled Reporting Date : **08-Jul-2022**

**Delivery Details**

Mode of Delivery : Carrier  
No. of coolers/boxes : 5  
Receipt Detail :

Security Seal : Not Available  
Temperature : 13.4 - Ice present  
No. of samples received / analysed : 3 / 3

**General Comments**

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- EP231X conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepancies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.



## Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exists.

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

| Laboratory sample ID | Sampling date / time | Sample ID         | WATER - EN055 - PG<br>Ionic Balance by ED037P, ED041G, ED045G &<br>WATER - EP231X<br>PFAS - Full Suite (28 analytes) | WATER - NT-01<br>Major Cations (Ca, Mg, Na, K) | WATER - NT-02<br>Major Anions (Chloride, Sulphate, Alkalinity) |
|----------------------|----------------------|-------------------|----------------------------------------------------------------------------------------------------------------------|------------------------------------------------|----------------------------------------------------------------|
| EP2207732-001        | 22-Jun-2022 12:02    | 0960_SW200_220622 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2207732-002        | 22-Jun-2022 12:30    | 0960_SW199_220622 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2207732-003        | 22-Jun-2022 15:05    | 0960_SW227_220622 | ✓                                                                                                                    | ✓                                              | ✓                                                              |

## Proactive Holding Time Report

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

## Requested Deliverables

|                                                                                                                  |       |                              |
|------------------------------------------------------------------------------------------------------------------|-------|------------------------------|
| <ul style="list-style-type: none"> <li>- A4 - AU Tax Invoice (INV)</li> </ul>                                    | Email | cardno.com.au                |
| <b>DERP LAB REPORTS</b>                                                                                          |       |                              |
| <ul style="list-style-type: none"> <li>- EDI Format - ESDAT (ESDAT)</li> </ul>                                   | Email | derp.labreports@esdat.com.au |
| <ul style="list-style-type: none"> <li>- *AU Certificate of Analysis - NATA (COA)</li> </ul>                     | Email | stantec.com                  |
| <ul style="list-style-type: none"> <li>- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)</li> </ul>    | Email | stantec.com                  |
| <ul style="list-style-type: none"> <li>- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)</li> </ul>            | Email | stantec.com                  |
| <ul style="list-style-type: none"> <li>- A4 - AU Sample Receipt Notification - Environmental HT (SRN)</li> </ul> | Email | stantec.com                  |
| <ul style="list-style-type: none"> <li>- Chain of Custody (CoC) (COC)</li> </ul>                                 | Email | stantec.com                  |
| <ul style="list-style-type: none"> <li>- EDI Format - ESDAT (ESDAT)</li> </ul>                                   | Email | stantec.com                  |
| <ul style="list-style-type: none"> <li>- EDI Format - XTab (XTAB)</li> </ul>                                     | Email | stantec.com                  |

## CERTIFICATE OF ANALYSIS

**Work Order** : **EP2207732**  
**Client** : **STANTEC AUSTRALIA PTY LTD**  
**Contact** : [REDACTED]  
**Address** : GROUND FLOOR 226 ADELAIDE TERRACE  
 PERTH 6000  
**Telephone** : ----  
**Project** : WA\_0960\_PFASOMP  
**Order number** : pfas-omp Learmonth  
**C-O-C number** : 39227  
**Sampler** : [REDACTED]  
**Site** : Learmonth SW/OTH - [REDACTED]  
**Quote number** : SY/139/19 B  
**No. of samples received** : 3  
**No. of samples analysed** : 3

**Page** : 1 of 6  
**Laboratory** : Environmental Division Perth  
**Contact** : [REDACTED]  
**Address** : 26 Rigali Way Wangara Western Australia Australia 6065  
**Telephone** : +6138549 9609  
**Date Samples Received** : 27-Jun-2022 11:40  
**Date Analysis Commenced** : 28-Jun-2022  
**Issue Date** : 08-Jul-2022 14:39



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>                |
|------------------------------------------------------------------------|----------------------------|----------------------------------------------|
| Canhuang Ke                                                            | Inorganics Supervisor      | Perth Inorganics, Wangara, Western Australia |
| <span style="background-color: black; color: black;">[REDACTED]</span> | Laboratory Manager (Perth) | Perth Inorganics, Wangara, Western Australia |
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator           | Sydney Organics, Smithfield, NSW             |



## 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 conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- 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.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, 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: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                                   |             |      |       | 0960_SW200_220622 | 0960_SW199_220622 | 0960_SW227_220622 | ----  | ----  |
|-------------------------------------------------------------------|-------------|------|-------|-------------------|-------------------|-------------------|-------|-------|
| Sampling date / time                                              |             |      |       | 22-Jun-2022 12:02 | 22-Jun-2022 12:30 | 22-Jun-2022 15:05 | ----  | ----  |
| Compound                                                          | CAS Number  | LOR  | Unit  | EP2207732-001     | EP2207732-002     | EP2207732-003     | ----- | ----- |
|                                                                   |             |      |       | Result            | Result            | Result            | ----  | ----  |
| <b>ED037P: Alkalinity by PC Titrator</b>                          |             |      |       |                   |                   |                   |       |       |
| Hydroxide Alkalinity as CaCO <sub>3</sub>                         | DMO-210-001 | 1    | mg/L  | <1                | <1                | <1                | ----  | ----  |
| Carbonate Alkalinity as CaCO <sub>3</sub>                         | 3812-32-6   | 1    | mg/L  | <1                | <1                | <1                | ----  | ----  |
| Bicarbonate Alkalinity as CaCO <sub>3</sub>                       | 71-52-3     | 1    | mg/L  | 67                | 128               | 100               | ----  | ----  |
| Total Alkalinity as CaCO <sub>3</sub>                             | ----        | 1    | mg/L  | 67                | 128               | 100               | ----  | ----  |
| <b>ED041G: Sulfate (Turbidimetric) as SO<sub>4</sub> 2- by DA</b> |             |      |       |                   |                   |                   |       |       |
| Sulfate as SO <sub>4</sub> - Turbidimetric                        | 14808-79-8  | 1    | mg/L  | 3                 | <1                | 6                 | ----  | ----  |
| <b>ED045G: Chloride by Discrete Analyser</b>                      |             |      |       |                   |                   |                   |       |       |
| Chloride                                                          | 16887-00-6  | 1    | mg/L  | 2                 | 3                 | 9                 | ----  | ----  |
| <b>ED093F: Dissolved Major Cations</b>                            |             |      |       |                   |                   |                   |       |       |
| Calcium                                                           | 7440-70-2   | 1    | mg/L  | 18                | 38                | 27                | ----  | ----  |
| Magnesium                                                         | 7439-95-4   | 1    | mg/L  | 2                 | 4                 | 3                 | ----  | ----  |
| Sodium                                                            | 7440-23-5   | 1    | mg/L  | 3                 | 4                 | 11                | ----  | ----  |
| Potassium                                                         | 7440-09-7   | 1    | mg/L  | 4                 | 6                 | 5                 | ----  | ----  |
| <b>EN055: Ionic Balance</b>                                       |             |      |       |                   |                   |                   |       |       |
| ∅ Total Anions                                                    | ----        | 0.01 | meq/L | 1.46              | 2.64              | 2.38              | ----  | ----  |
| ∅ Total Cations                                                   | ----        | 0.01 | meq/L | 1.30              | 2.55              | 2.20              | ----  | ----  |
| ∅ Ionic Balance                                                   | ----        | 0.01 | %     | 5.88              | 1.72              | 3.85              | ----  | ----  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>                      |             |      |       |                   |                   |                   |       |       |
| Perfluorobutane sulfonic acid (PFBS)                              | 375-73-5    | 0.02 | µg/L  | <0.02             | <0.02             | <0.02             | ----  | ----  |
| Perfluoropentane sulfonic acid (PFPeS)                            | 2706-91-4   | 0.02 | µg/L  | <0.02             | <0.02             | <0.02             | ----  | ----  |
| Perfluorohexane sulfonic acid (PFHxS)                             | 355-46-4    | 0.01 | µg/L  | <0.01             | <0.01             | <0.01             | ----  | ----  |
| Perfluoroheptane sulfonic acid (PFHpS)                            | 375-92-8    | 0.02 | µg/L  | <0.02             | <0.02             | <0.02             | ----  | ----  |
| Perfluorooctane sulfonic acid (PFOS)                              | 1763-23-1   | 0.01 | µg/L  | <0.01             | <0.01             | 0.11              | ----  | ----  |
| Perfluorodecane sulfonic acid (PFDS)                              | 335-77-3    | 0.02 | µg/L  | <0.02             | <0.02             | <0.02             | ----  | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>                    |             |      |       |                   |                   |                   |       |       |
| 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             | ----  | ----  |



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_SW200_220622 | 0960_SW199_220622 | 0960_SW227_220622 | ----  | ----  |
|------------------------------------------------------------|-------------|------|------|-------------------|-------------------|-------------------|-------|-------|
| Sampling date / time                                       |             |      |      | 22-Jun-2022 12:02 | 22-Jun-2022 12:30 | 22-Jun-2022 15:05 | ----  | ----  |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2207732-001     | EP2207732-002     | EP2207732-003     | ----- | ----- |
|                                                            |             |      |      | Result            | Result            | Result            | ----  | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                   |                   |                   |       |       |
| 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             | ----  | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                   |                   |                   |       |       |
| 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             | ----  | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                   |                   |                   |       |       |
| 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             | ----  | ----  |



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_SW200_220622 | 0960_SW199_220622 | 0960_SW227_220622 | ----  | ----  |
|---------------------------------------------------------------|--------------------|------|------|-------------------|-------------------|-------------------|-------|-------|
| Sampling date / time                                          |                    |      |      | 22-Jun-2022 12:02 | 22-Jun-2022 12:30 | 22-Jun-2022 15:05 | ----  | ----  |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2207732-001     | EP2207732-002     | EP2207732-003     | ----- | ----- |
|                                                               |                    |      |      | Result            | Result            | Result            | ----  | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                   |                   |                   |       |       |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | ----  | ----  |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                   |                   |                   |       |       |
| Sum of PFAS                                                   | ----               | 0.01 | µg/L | <0.01             | <0.01             | 0.11              | ----  | ----  |
| Sum of PFHxS and PFOS                                         | 355-46-4/1763-23-1 | 0.01 | µg/L | <0.01             | <0.01             | 0.11              | ----  | ----  |
| Sum of PFAS (WA DER List)                                     | ----               | 0.01 | µg/L | <0.01             | <0.01             | 0.11              | ----  | ----  |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                   |                   |                   |       |       |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 101               | 90.8              | 100               | ----  | ----  |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 104               | 104               | 96.2              | ----  | ----  |



Page : 6 of 6  
Work Order : EP2207732  
Client : STANTEC AUSTRALIA PTY LTD  
Project : WA\_0960\_PFASOMP



## Surrogate Control Limits

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

## Inter-Laboratory Testing

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

|                                |                                                           |                                |                                                                 |
|--------------------------------|-----------------------------------------------------------|--------------------------------|-----------------------------------------------------------------|
| <b>Work Order</b>              | <b>: EP2207732</b>                                        | <b>Page</b>                    | <b>: 1 of 9</b>                                                 |
| <b>Client</b>                  | <b>: STANTEC AUSTRALIA PTY LTD</b>                        | <b>Laboratory</b>              | <b>: Environmental Division Perth</b>                           |
| <b>Contact</b>                 | <b>: [REDACTED]</b>                                       | <b>Contact</b>                 | <b>: [REDACTED]</b>                                             |
| <b>Address</b>                 | <b>: GROUND FLOOR 226 ADELAIDE TERRACE<br/>PERTH 6000</b> | <b>Address</b>                 | <b>: 26 Rigali Way Wangara Western Australia Australia 6065</b> |
| <b>Telephone</b>               | <b>: ----</b>                                             | <b>Telephone</b>               | <b>: +6138549 9609</b>                                          |
| <b>Project</b>                 | <b>: WA_0960_PFASOMP</b>                                  | <b>Date Samples Received</b>   | <b>: 27-Jun-2022</b>                                            |
| <b>Order number</b>            | <b>: pfas-omp Learmonth</b>                               | <b>Date Analysis Commenced</b> | <b>: 28-Jun-2022</b>                                            |
| <b>C-O-C number</b>            | <b>: 39227</b>                                            | <b>Issue Date</b>              | <b>: 08-Jul-2022</b>                                            |
| <b>Sampler</b>                 | <b>: [REDACTED]</b>                                       |                                |                                                                 |
| <b>Site</b>                    | <b>: Learmonth SW/OTH - [REDACTED]</b>                    |                                |                                                                 |
| <b>Quote number</b>            | <b>: SY/139/19 B</b>                                      |                                |                                                                 |
| <b>No. of samples received</b> | <b>: 3</b>                                                |                                |                                                                 |
| <b>No. of samples analysed</b> | <b>: 3</b>                                                |                                |                                                                 |



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>                |
|--------------------|----------------------------|----------------------------------------------|
| Canhuang Ke        | Inorganics Supervisor      | Perth Inorganics, Wangara, Western Australia |
| [REDACTED]         | Laboratory Manager (Perth) | Perth Inorganics, Wangara, Western Australia |
| [REDACTED]         | LCMS Coordinator           | Sydney Organics, Smithfield, NSW             |



## 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**

| Sub-Matrix: WATER                                                 |                   |                                          |             | Laboratory Duplicate (DUP) Report |      |                 |                  |         |                    |
|-------------------------------------------------------------------|-------------------|------------------------------------------|-------------|-----------------------------------|------|-----------------|------------------|---------|--------------------|
| Laboratory sample ID                                              | Sample ID         | Method: Compound                         | CAS Number  | LOR                               | Unit | Original Result | Duplicate Result | RPD (%) | Acceptable RPD (%) |
| ED037P: Alkalinity by PC Titrator (QC Lot: 4445364)               |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207727-002                                                     | Anonymous         | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 835             | 846              | 1.3     | 0% - 20%           |
|                                                                   |                   | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 835             | 846              | 1.3     | 0% - 20%           |
| EP2207727-012                                                     | Anonymous         | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 275             | 288              | 4.7     | 0% - 20%           |
|                                                                   |                   | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 275             | 288              | 4.7     | 0% - 20%           |
| ED037P: Alkalinity by PC Titrator (QC Lot: 4445365)               |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207732-003                                                     | 0960_SW227_220622 | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 100             | 100              | 0.0     | 0% - 20%           |
|                                                                   |                   | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 100             | 100              | 0.0     | 0% - 20%           |
| EP2207893-004                                                     | Anonymous         | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 89              | 78               | 12.2    | 0% - 20%           |
|                                                                   |                   | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 89              | 78               | 12.2    | 0% - 20%           |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4429725) |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207731-001                                                     | Anonymous         | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 2670            | 2660             | 0.5     | 0% - 20%           |
| EP2207731-011                                                     | Anonymous         | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 5950            | 5910             | 0.7     | 0% - 20%           |
| ED045G: Chloride by Discrete Analyser (QC Lot: 4429724)           |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207731-001                                                     | Anonymous         | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 23100           | 25000            | 8.1     | 0% - 20%           |
| EP2207731-011                                                     | Anonymous         | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 43300           | 42000            | 3.0     | 0% - 20%           |



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 (%) |
| ED093F: Dissolved Major Cations (QC Lot: 4427080)         |                   |                                                |            |                                   |      |                 |                  |         |                    |
| EP2207727-001                                             | Anonymous         | ED093F: Calcium                                | 7440-70-2  | 1                                 | mg/L | 145             | 144              | 0.0     | 0% - 20%           |
|                                                           |                   | ED093F: Magnesium                              | 7439-95-4  | 1                                 | mg/L | 268             | 269              | 0.0     | 0% - 20%           |
|                                                           |                   | ED093F: Sodium                                 | 7440-23-5  | 1                                 | mg/L | 2980            | 3010             | 1.2     | 0% - 20%           |
|                                                           |                   | ED093F: Potassium                              | 7440-09-7  | 1                                 | mg/L | 132             | 133              | 1.3     | 0% - 20%           |
| EP2207727-011                                             | Anonymous         | ED093F: Calcium                                | 7440-70-2  | 1                                 | mg/L | 742             | 738              | 0.6     | 0% - 20%           |
|                                                           |                   | ED093F: Magnesium                              | 7439-95-4  | 1                                 | mg/L | 947             | 938              | 0.9     | 0% - 20%           |
|                                                           |                   | ED093F: Sodium                                 | 7440-23-5  | 1                                 | mg/L | 8290            | 8240             | 0.5     | 0% - 20%           |
|                                                           |                   | ED093F: Potassium                              | 7440-09-7  | 1                                 | mg/L | 222             | 221              | 0.5     | 0% - 20%           |
| ED093F: Dissolved Major Cations (QC Lot: 4427081)         |                   |                                                |            |                                   |      |                 |                  |         |                    |
| EP2207732-003                                             | 0960_SW227_220622 | ED093F: Calcium                                | 7440-70-2  | 1                                 | mg/L | 27              | 28               | 0.0     | 0% - 20%           |
|                                                           |                   | ED093F: Magnesium                              | 7439-95-4  | 1                                 | mg/L | 3               | 3                | 0.0     | No Limit           |
|                                                           |                   | ED093F: Sodium                                 | 7440-23-5  | 1                                 | mg/L | 11              | 10               | 0.0     | 0% - 50%           |
|                                                           |                   | ED093F: Potassium                              | 7440-09-7  | 1                                 | mg/L | 5               | 5                | 0.0     | No Limit           |
| EP2207737-010                                             | Anonymous         | ED093F: Calcium                                | 7440-70-2  | 1                                 | mg/L | 171             | 176              | 2.6     | 0% - 20%           |
|                                                           |                   | ED093F: Magnesium                              | 7439-95-4  | 1                                 | mg/L | 205             | 207              | 1.1     | 0% - 20%           |
|                                                           |                   | ED093F: Sodium                                 | 7440-23-5  | 1                                 | mg/L | 2190            | 2220             | 1.3     | 0% - 20%           |
|                                                           |                   | ED093F: Potassium                              | 7440-09-7  | 1                                 | mg/L | 104             | 104              | 0.0     | 0% - 20%           |
| EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4438736)   |                   |                                                |            |                                   |      |                 |                  |         |                    |
| EP2207731-006                                             | 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           |
| EP2207731-015                                             | Anonymous         | EP231X: Perfluorohexane sulfonic acid (PFHxS)  | 355-46-4   | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
|                                                           |                   | EP231X: Perfluorooctane sulfonic acid (PFOS)   | 1763-23-1  | 0.01                              | µg/L | <0.01           | <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: 4438736) |                   |                                                |            |                                   |      |                 |                  |         |                    |
| EP2207731-006                                             | Anonymous         | EP231X: Perfluorooctanoic acid (PFOA)          | 335-67-1   | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
|                                                           |                   | EP231X: Perfluoropentanoic acid (PFPeA)        | 2706-90-3  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |                   | EP231X: Perfluorohexanoic acid (PFHxA)         | 307-24-4   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |                   | EP231X: Perfluoroheptanoic acid (PFHpA)        | 375-85-9   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |                   | EP231X: Perfluorononanoic acid (PFNA)          | 375-95-1   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |                   | EP231X: Perfluorodecanoic acid (PFDA)          | 335-76-2   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |                   | EP231X: Perfluoroundecanoic acid (PFUnDA)      | 2058-94-8  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |                   | EP231X: Perfluorododecanoic acid (PFDoDA)      | 307-55-1   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |                   | EP231X: Perfluorotridecanoic acid (PFTTrDA)    | 72629-94-8 | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |

| Sub-Matrix: WATER                                                     |           |                                                                   |            | Laboratory Duplicate (DUP) Report |      |                 |                  |         |                    |
|-----------------------------------------------------------------------|-----------|-------------------------------------------------------------------|------------|-----------------------------------|------|-----------------|------------------|---------|--------------------|
| Laboratory sample ID                                                  | Sample ID | Method: Compound                                                  | CAS Number | LOR                               | Unit | Original Result | Duplicate Result | RPD (%) | Acceptable RPD (%) |
| EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4438736) - continued |           |                                                                   |            |                                   |      |                 |                  |         |                    |
| EP2207731-006                                                         | Anonymous | EP231X: Perfluorotetradecanoic acid (PFTeDA)                      | 376-06-7   | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                       |           | EP231X: Perfluorobutanoic acid (PFBA)                             | 375-22-4   | 0.1                               | µg/L | <0.1            | <0.1             | 0.0     | No Limit           |
| EP2207731-015                                                         | Anonymous | EP231X: Perfluorooctanoic acid (PFOA)                             | 335-67-1   | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
|                                                                       |           | EP231X: Perfluoropentanoic acid (PFPeA)                           | 2706-90-3  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |           | EP231X: Perfluorohexanoic acid (PFHxA)                            | 307-24-4   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |           | EP231X: Perfluoroheptanoic acid (PFHpA)                           | 375-85-9   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |           | EP231X: Perfluorononanoic acid (PFNA)                             | 375-95-1   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |           | EP231X: Perfluorodecanoic acid (PFDA)                             | 335-76-2   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |           | EP231X: Perfluoroundecanoic acid (PFUnDA)                         | 2058-94-8  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |           | EP231X: Perfluorododecanoic acid (PFDoDA)                         | 307-55-1   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |           | EP231X: Perfluorotridecanoic acid (PFTrDA)                        | 72629-94-8 | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |           | EP231X: Perfluorotetradecanoic acid (PFTeDA)                      | 376-06-7   | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                       |           | EP231X: Perfluorobutanoic acid (PFBA)                             | 375-22-4   | 0.1                               | µg/L | <0.1            | <0.1             | 0.0     | No Limit           |
|                                                                       |           | EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4438736)             |            |                                   |      |                 |                  |         |                    |
| EP2207731-006                                                         | Anonymous | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |           | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |           | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |           | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8 | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                       |           | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                       |           | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7 | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                       |           | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
| EP2207731-015                                                         | Anonymous | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |           | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |           | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |           | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8 | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                       |           | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                       |           | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7 | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                       |           | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4438736)          |           |                                                                   |            |                                   |      |                 |                  |         |                    |

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 Work Order : EP2207732  
 Client : STANTEC AUSTRALIA PTY LTD  
 Project : WA\_0960\_PFASOMP



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 (%) |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4438736) - continued |           |                                                     |             |                                   |      |                 |                  |         |                    |
| EP2207731-006                                                            | Anonymous | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)   | 757124-72-4 | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                          |           | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)   | 27619-97-2  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                          |           | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)   | 39108-34-4  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                          |           | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS) | 120226-60-0 | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
| EP2207731-015                                                            | Anonymous | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)   | 757124-72-4 | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                          |           | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)   | 27619-97-2  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                          |           | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)   | 39108-34-4  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                          |           | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS) | 120226-60-0 | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
| EP231P: PFAS Sums (QC Lot: 4438736)                                      |           |                                                     |             |                                   |      |                 |                  |         |                    |
| EP2207731-006                                                            | Anonymous | EP231X: Sum of PFAS                                 | ----        | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
| EP2207731-015                                                            | Anonymous | EP231X: Sum of PFAS                                 | ----        | 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**

| Sub-Matrix: WATER                                                |                 |      |      | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                    |                       |      |
|------------------------------------------------------------------|-----------------|------|------|-----------------------------|---------------------------------------|--------------------|-----------------------|------|
|                                                                  |                 |      |      |                             | Spike<br>Concentration                | Spike Recovery (%) | Acceptable Limits (%) |      |
| Method: Compound                                                 | CAS Number      | LOR  | Unit | Result                      |                                       |                    | LCS                   | Low  |
| ED037P: Alkalinity by PC Titrator (QCLot: 4445364)               |                 |      |      |                             |                                       |                    |                       |      |
| ED037-P: Hydroxide Alkalinity as CaCO3                           | DMO-210-00<br>1 | 1    | mg/L | <1                          | ----                                  | ----               | ----                  | ---- |
| ED037-P: Carbonate Alkalinity as CaCO3                           | 3812-32-6       | 1    | mg/L | <1                          | ----                                  | ----               | ----                  | ---- |
| ED037-P: Bicarbonate Alkalinity as CaCO3                         | 71-52-3         | 1    | mg/L | <1                          | ----                                  | ----               | ----                  | ---- |
| ED037-P: Total Alkalinity as CaCO3                               | ----            | 1    | mg/L | <1                          | 20 mg/L                               | 105                | 87.8                  | 118  |
|                                                                  |                 |      |      | <1                          | 200 mg/L                              | 97.1               | 87.8                  | 118  |
| ED037P: Alkalinity by PC Titrator (QCLot: 4445365)               |                 |      |      |                             |                                       |                    |                       |      |
| ED037-P: Hydroxide Alkalinity as CaCO3                           | DMO-210-00<br>1 | 1    | mg/L | <1                          | ----                                  | ----               | ----                  | ---- |
| ED037-P: Carbonate Alkalinity as CaCO3                           | 3812-32-6       | 1    | mg/L | <1                          | ----                                  | ----               | ----                  | ---- |
| ED037-P: Bicarbonate Alkalinity as CaCO3                         | 71-52-3         | 1    | mg/L | <1                          | ----                                  | ----               | ----                  | ---- |
| ED037-P: Total Alkalinity as CaCO3                               | ----            | 1    | mg/L | <1                          | 20 mg/L                               | 102                | 87.8                  | 118  |
|                                                                  |                 |      |      | <1                          | 200 mg/L                              | 96.5               | 87.8                  | 118  |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4429725) |                 |      |      |                             |                                       |                    |                       |      |
| ED041G: Sulfate as SO4 - Turbidimetric                           | 14808-79-8      | 1    | mg/L | <1                          | 25 mg/L                               | 100                | 89.9                  | 112  |
|                                                                  |                 |      |      | <1                          | 500 mg/L                              | 102                | 89.9                  | 112  |
| ED045G: Chloride by Discrete Analyser (QCLot: 4429724)           |                 |      |      |                             |                                       |                    |                       |      |
| ED045G: Chloride                                                 | 16887-00-6      | 1    | mg/L | <1                          | 10 mg/L                               | 103                | 88.6                  | 113  |
|                                                                  |                 |      |      | <1                          | 1000 mg/L                             | 102                | 88.6                  | 113  |
| ED093F: Dissolved Major Cations (QCLot: 4427080)                 |                 |      |      |                             |                                       |                    |                       |      |
| ED093F: Calcium                                                  | 7440-70-2       | 1    | mg/L | <1                          | 50 mg/L                               | 90.7               | 86.5                  | 117  |
| ED093F: Magnesium                                                | 7439-95-4       | 1    | mg/L | <1                          | 50 mg/L                               | 93.2               | 88.4                  | 110  |
| ED093F: Sodium                                                   | 7440-23-5       | 1    | mg/L | <1                          | 50 mg/L                               | 105                | 91.4                  | 113  |
| ED093F: Potassium                                                | 7440-09-7       | 1    | mg/L | <1                          | 50 mg/L                               | 94.6               | 84.6                  | 108  |
| ED093F: Dissolved Major Cations (QCLot: 4427081)                 |                 |      |      |                             |                                       |                    |                       |      |
| ED093F: Calcium                                                  | 7440-70-2       | 1    | mg/L | <1                          | 50 mg/L                               | 91.4               | 86.5                  | 117  |
| ED093F: Magnesium                                                | 7439-95-4       | 1    | mg/L | <1                          | 50 mg/L                               | 94.0               | 88.4                  | 110  |
| ED093F: Sodium                                                   | 7440-23-5       | 1    | mg/L | <1                          | 50 mg/L                               | 106                | 91.4                  | 113  |
| ED093F: Potassium                                                | 7440-09-7       | 1    | mg/L | <1                          | 50 mg/L                               | 95.1               | 84.6                  | 108  |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4438736)           |                 |      |      |                             |                                       |                    |                       |      |
| EP231X: Perfluorobutane sulfonic acid (PFBS)                     | 375-73-5        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 126                | 72.0                  | 130  |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)                   | 2706-91-4       | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 118                | 71.0                  | 127  |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)                    | 355-46-4        | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 113                | 68.0                  | 131  |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)                   | 375-92-8        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 129                | 69.0                  | 134  |





Sub-Matrix: **WATER**

| Sub-Matrix: WATER                                                  |             |      |      | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |     |
|--------------------------------------------------------------------|-------------|------|------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|-----|
|                                                                    |             |      |      |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |     |
| Method: Compound                                                   | CAS Number  | LOR  | Unit | Result                      |                                       |                           |                                   |     |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4438736) - continued |             |      |      |                             |                                       |                           |                                   |     |
| EP231X: Perfluorooctane sulfonic acid (PFOS)                       | 1763-23-1   | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 127                       | 65.0                              | 140 |
| EP231X: Perfluorodecane sulfonic acid (PFDS)                       | 335-77-3    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 126                       | 53.0                              | 142 |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4438736)           |             |      |      |                             |                                       |                           |                                   |     |
| 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                             | 128                       | 72.0                              | 129 |
| EP231X: Perfluorohexanoic acid (PFHxA)                             | 307-24-4    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 122                       | 72.0                              | 129 |
| EP231X: Perfluoroheptanoic acid (PFHpA)                            | 375-85-9    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 117                       | 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                             | 122                       | 69.0                              | 130 |
| EP231X: Perfluorodecanoic acid (PFDA)                              | 335-76-2    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 113                       | 71.0                              | 129 |
| EP231X: Perfluoroundecanoic acid (PFUnDA)                          | 2058-94-8   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 120                       | 69.0                              | 133 |
| EP231X: Perfluorododecanoic acid (PFDoDA)                          | 307-55-1    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 120                       | 72.0                              | 134 |
| EP231X: Perfluorotridecanoic acid (PFTrDA)                         | 72629-94-8  | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 137                       | 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: 4438736)               |             |      |      |                             |                                       |                           |                                   |     |
| EP231X: Perfluorooctane sulfonamide (FOSA)                         | 754-91-6    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 132                       | 67.0                              | 137 |
| EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)              | 31506-32-8  | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 132                       | 68.0                              | 141 |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)               | 4151-50-2   | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 135                       | 62.6                              | 147 |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)       | 24448-09-7  | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 115                       | 66.0                              | 145 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)        | 1691-99-2   | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 120                       | 57.6                              | 145 |
| EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)  | 2355-31-9   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 120                       | 65.0                              | 136 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)   | 2991-50-6   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 119                       | 61.0                              | 135 |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4438736)        |             |      |      |                             |                                       |                           |                                   |     |
| EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                  | 757124-72-4 | 0.05 | µg/L | <0.05                       | 0.25 µg/L                             | 126                       | 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                             | 127                       | 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                             | 138                       | 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                             | 137                       | 71.4                              | 144 |

## Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

|                      |           |                  |            | Matrix Spike (MS) Report |                  |                       |      |
|----------------------|-----------|------------------|------------|--------------------------|------------------|-----------------------|------|
|                      |           |                  |            | Spike                    | SpikeRecovery(%) | Acceptable Limits (%) |      |
| Laboratory sample ID | Sample ID | Method: Compound | CAS Number | Concentration            | MS               | Low                   | High |





Sub-Matrix: WATER

| Laboratory sample ID    Sample ID    Method: Compound    CAS Number     |           |                                                     |             | Matrix Spike (MS) Report |                  |                       |      |
|-------------------------------------------------------------------------|-----------|-----------------------------------------------------|-------------|--------------------------|------------------|-----------------------|------|
|                                                                         |           |                                                     |             | Spike                    | SpikeRecovery(%) | Acceptable Limits (%) |      |
|                                                                         |           |                                                     |             | Concentration            | MS               | Low                   | High |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4438736) - continued |           |                                                     |             |                          |                  |                       |      |
| EP2207731-010                                                           | Anonymous | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)   | 757124-72-4 | 0.25 µg/L                | 101              | 63.0                  | 143  |
|                                                                         |           | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)   | 27619-97-2  | 0.25 µg/L                | 120              | 64.0                  | 140  |
|                                                                         |           | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)   | 39108-34-4  | 0.25 µg/L                | 117              | 67.0                  | 138  |
|                                                                         |           | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS) | 120226-60-0 | 0.25 µg/L                | 117              | 71.4                  | 144  |

## QA/QC Compliance Assessment to assist with Quality Review

Work Order : EP2207732

Page : 1 of 5

Client : STANTEC AUSTRALIA PTY LTD

Contact : [REDACTED]

Project : WA\_0960\_PFASOMP

Site : Learmonth SW/OTH - [REDACTED]

Sampler : [REDACTED]

Order number : pfas-omp Learmonth

Laboratory : Environmental Division Perth

Telephone : +6138549 9609

Date Samples Received : 27-Jun-2022

Issue Date : 08-Jul-2022

No. of samples received : 3

No. of samples analysed : 3

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

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

### Summary of Outliers

#### Outliers : Quality Control Samples

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

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

#### Outliers : Analysis Holding Time Compliance

- Analysis Holding Time Outliers exist - please see following pages for full details.

#### Outliers : Frequency of Quality Control Samples

- **NO** Quality Control Sample Frequency Outliers exist.

Page : 2 of 5  
 Work Order : EP2207732  
 Client : STANTEC AUSTRALIA PTY LTD  
 Project : WA\_0960\_PFASOMP



### 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                                                                               |
|-------------------------------------------------------------|----------------------|------------------|--------------------------------------------|------------|----------------|--------|---------------------------------------------------------------------------------------|
| <b>Matrix Spike (MS) Recoveries</b>                         |                      |                  |                                            |            |                |        |                                                                                       |
| ED041G: Sulfate (Turbidimetric) as SO <sub>4</sub> 2- by DA | EP2207731--001       | Anonymous        | Sulfate as SO <sub>4</sub> - Turbidimetric | 14808-79-8 | Not Determined | ----   | MS recovery not determined, background level greater than or equal to 4x spike level. |
| ED045G: Chloride by Discrete Analyser                       | EP2207731--001       | Anonymous        | Chloride                                   | 16887-00-6 | Not Determined | ----   | MS recovery not determined, background level greater than or equal to 4x spike level. |

### Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

| Method<br>Container / Client Sample ID(s)                                 | Extraction / Preparation |                    |              | Analysis      |                  |                  |
|---------------------------------------------------------------------------|--------------------------|--------------------|--------------|---------------|------------------|------------------|
|                                                                           | Date extracted           | Due for extraction | Days overdue | Date analysed | Due for analysis | Days overdue     |
| <b>ED037P: Alkalinity by PC Titrator</b>                                  |                          |                    |              |               |                  |                  |
| Clear Plastic Bottle - Natural<br>0960_SW200_220622,<br>0960_SW227_220622 | 0960_SW199_220622,       | ----               | ----         | ----          | 07-Jul-2022      | 06-Jul-2022<br>1 |

### Analysis Holding Time Compliance

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

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

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

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

Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                                                              | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |
|-------------------------------------------------------------------------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|
| Container / Client Sample ID(s)                                                     |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| ED037P: Alkalinity by PC Titrator                                                   |             |                          |                    |            |               |                  |            |
| Clear Plastic Bottle - Natural (ED037-P)<br>0960_SW200_220622,<br>0960_SW227_220622 | 22-Jun-2022 | ----                     | ----               | ----       | 07-Jul-2022   | 06-Jul-2022      | ✘          |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA                                     |             |                          |                    |            |               |                  |            |
| Clear Plastic Bottle - Natural (ED041G)<br>0960_SW200_220622,<br>0960_SW227_220622  | 22-Jun-2022 | ----                     | ----               | ----       | 08-Jul-2022   | 20-Jul-2022      | ✔          |

Page : 3 of 5  
 Work Order : EP2207732  
 Client : STANTEC AUSTRALIA PTY LTD  
 Project : WA\_0960\_PFASOMP



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                                                             | Sample Date        | Extraction / Preparation |                    |             | Analysis      |                  |             |   |
|------------------------------------------------------------------------------------|--------------------|--------------------------|--------------------|-------------|---------------|------------------|-------------|---|
| Container / Client Sample ID(s)                                                    |                    | Date extracted           | Due for extraction | Evaluation  | Date analysed | Due for analysis | Evaluation  |   |
| ED045G: Chloride by Discrete Analyser                                              |                    |                          |                    |             |               |                  |             |   |
| Clear Plastic Bottle - Natural (ED045G)<br>0960_SW200_220622,<br>0960_SW227_220622 | 0960_SW199_220622, | 22-Jun-2022              | ----               | ----        | ----          | 08-Jul-2022      | 20-Jul-2022 | ✓ |
| ED093F: Dissolved Major Cations                                                    |                    |                          |                    |             |               |                  |             |   |
| Clear Plastic Bottle - Natural (ED093F)<br>0960_SW200_220622,<br>0960_SW227_220622 | 0960_SW199_220622, | 22-Jun-2022              | ----               | ----        | ----          | 28-Jun-2022      | 29-Jun-2022 | ✓ |
| EP231A: Perfluoroalkyl Sulfonic Acids                                              |                    |                          |                    |             |               |                  |             |   |
| HDPE (no PTFE) (EP231X)<br>0960_SW200_220622,<br>0960_SW227_220622                 | 0960_SW199_220622, | 22-Jun-2022              | 05-Jul-2022        | 19-Dec-2022 | ✓             | 07-Jul-2022      | 19-Dec-2022 | ✓ |
| EP231B: Perfluoroalkyl Carboxylic Acids                                            |                    |                          |                    |             |               |                  |             |   |
| HDPE (no PTFE) (EP231X)<br>0960_SW200_220622,<br>0960_SW227_220622                 | 0960_SW199_220622, | 22-Jun-2022              | 05-Jul-2022        | 19-Dec-2022 | ✓             | 07-Jul-2022      | 19-Dec-2022 | ✓ |
| EP231C: Perfluoroalkyl Sulfonamides                                                |                    |                          |                    |             |               |                  |             |   |
| HDPE (no PTFE) (EP231X)<br>0960_SW200_220622,<br>0960_SW227_220622                 | 0960_SW199_220622, | 22-Jun-2022              | 05-Jul-2022        | 19-Dec-2022 | ✓             | 07-Jul-2022      | 19-Dec-2022 | ✓ |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids                                         |                    |                          |                    |             |               |                  |             |   |
| HDPE (no PTFE) (EP231X)<br>0960_SW200_220622,<br>0960_SW227_220622                 | 0960_SW199_220622, | 22-Jun-2022              | 05-Jul-2022        | 19-Dec-2022 | ✓             | 07-Jul-2022      | 19-Dec-2022 | ✓ |
| EP231P: PFAS Sums                                                                  |                    |                          |                    |             |               |                  |             |   |
| HDPE (no PTFE) (EP231X)<br>0960_SW200_220622,<br>0960_SW227_220622                 | 0960_SW199_220622, | 22-Jun-2022              | 05-Jul-2022        | 19-Dec-2022 | ✓             | 07-Jul-2022      | 19-Dec-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                            |         | Count |         | Rate (%) |          |            | Quality Control Specification  |
|--------------------------------------------------------|---------|-------|---------|----------|----------|------------|--------------------------------|
| Analytical Methods                                     | Method  | QC    | Regular | Actual   | Expected | Evaluation |                                |
|                                                        |         |       |         |          |          |            |                                |
| Laboratory Duplicates (DUP)                            |         |       |         |          |          |            |                                |
| Alkalinity by Auto Titrator                            | ED037-P | 4     | 40      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 4     | 39      | 10.26    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Laboratory Control Samples (LCS)                       |         |       |         |          |          |            |                                |
| Alkalinity by Auto Titrator                            | ED037-P | 4     | 40      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 2     | 39      | 5.13     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Method Blanks (MB)                                     |         |       |         |          |          |            |                                |
| Alkalinity by Auto Titrator                            | ED037-P | 2     | 40      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 2     | 39      | 5.13     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Matrix Spikes (MS)                                     |         |       |         |          |          |            |                                |
| Chloride by Discrete Analyser                          | ED045G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |





## Brief Method Summaries

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

| Analytical Methods                                                 | Method       | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------------------|--------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alkalinity by Auto Titrator                                        | ED037-P      | WATER  | In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                                                                                                                                                                                                                |
| Sulfate (Turbidimetric) as SO <sub>4</sub> 2- by Discrete Analyser | ED041G       | WATER  | In house: Referenced to APHA 4500-SO <sub>4</sub> . Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO <sub>4</sub> suspension is measured by a photometer and the SO <sub>4</sub> -2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                         |
| Chloride by Discrete Analyser                                      | ED045G       | WATER  | In house: Referenced to APHA 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm.                                                                                                                                                                                                                                                                                                                                                                |
| Major Cations - Dissolved                                          | ED093F       | WATER  | In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                           |
| Ionic Balance by PCT DA and Turbi SO <sub>4</sub> DA               | * EN055 - PG | WATER  | In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS               | EP231X       | WATER  | In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements. |
| Preparation Methods                                                | Method       | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Solid Phase Extraction (SPE) for PFAS in water                     | ORG72        | WATER  | In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.                                                                                                                                                                                                |



# CHAIN OF CUSTODY

COC#: 39228

ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: Learmonth SD - SC

ORDER NO: pfas-omp Learmonth

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:

## SAMPLE DETAILS

## ANALYSIS REQUIRED

| SAMPLE | NAME       | DESCRIPTION | DATE / TIME            | MATRIX | TOTAL BOTTLES        | ON HOLD | PFAS Sediments SEDIMENT | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|------------|-------------|------------------------|--------|----------------------|---------|-------------------------|----------------------|------------------------|
| 001    | 0960_SD123 |             | 22/06/2022<br>10:11 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |
| 002    | 0960_QC118 |             | 22/06/2022<br>10:11 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |
| 003    | 0960_SD200 |             | 22/06/2022<br>12:02 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |
| 004    | 0960_SD199 |             | 22/06/2022<br>12:30 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |
| 005    | 0960_SS198 |             | 22/06/2022<br>01:57 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |
| 006    | 0960_SS293 |             | 22/06/2022<br>02:07 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |
| 007    | 0960_QC122 |             | 22/06/2022<br>02:08 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |
| 008    | 0960_SS292 |             | 22/06/2022<br>02:18 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |
| 009    | 0960_SS291 |             | 22/06/2022<br>02:19 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |



# CHAIN OF CUSTODY

COC#: 39228

ALS Laboratory: EP Perth

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: Learmonth SD - SC

ORDER NO: pfas-omp Learmonth

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:

## SAMPLE DETAILS

## ANALYSIS REQUIRED

| SAMPLE | NAME       | DESCRIPTION | DATE / TIME         | MATRIX | TOTAL BOTTLES        | ON HOLD | PFAS Sediments SEDIMENT | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|------------|-------------|---------------------|--------|----------------------|---------|-------------------------|----------------------|------------------------|
| 010    | 0960_SS227 |             | 22/06/2022 02:51 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |
| 011    | 0960_QC123 |             | 22/06/2022 02:52 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |



# CHAIN OF CUSTODY

COC#: 39228

ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: Learmonth SD - SC

ORDER NO: pfas-omp Learmonth

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:

| SAMPLE | SAMPLE NAME | BOTTLE NAME   | VOLUME | BARCODE        | TYPE | FILTERED | REASON |
|--------|-------------|---------------|--------|----------------|------|----------|--------|
| 001    | 0960_SD123  | HDPE Soil Jar | 200 mL | 00621019097737 | Grey | No       |        |
| 002    | 0960_QC118  | HDPE Soil Jar | 200 mL | 00621019097731 | Grey | No       |        |
| 003    | 0960_SD200  | HDPE Soil Jar | 200 mL | 00621019097771 | Grey | No       |        |
| 004    | 0960_SD199  | HDPE Soil Jar | 200 mL | 00621019097754 | Grey | No       |        |
| 005    | 0960_SS198  | HDPE Soil Jar | 200 mL | 00620322029671 | Grey | No       |        |
| 006    | 0960_SS293  | HDPE Soil Jar | 200 mL | 00620322036443 | Grey | No       |        |
| 007    | 0960_QC122  | HDPE Soil Jar | 200 mL | 00620322029584 | Grey | No       |        |
| 008    | 0960_SS292  | HDPE Soil Jar | 200 mL | 00620322036441 | Grey | No       |        |
| 009    | 0960_SS291  | HDPE Soil Jar | 200 mL | 00620322029674 | Grey | No       |        |
| 010    | 0960_SS227  | HDPE Soil Jar | 200 mL | 00620322036427 | Grey | No       |        |
| 011    | 0960_QC123  | HDPE Soil Jar | 200 mL | 00620322036425 | Grey | No       |        |

Total Bottle Count: ALS: 11, Non ALS: 0

## SAMPLE RECEIPT NOTIFICATION (SRN)

**Work Order : EP2207733**

|                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Client : <b>STANTEC AUSTRALIA PTY LTD</b></p> <p>Contact : [REDACTED]</p> <p>Address : GROUND FLOOR 226 ADELAIDE TERRACE<br/>PERTH 6000</p> <p>E-mail : [REDACTED]@stantec.com</p> <p>Telephone : ----</p> <p>Facsimile : ----</p> <p>Project : WA_0960_PFASOMP</p> <p>Order number : pfas-omp Learmonth</p> <p>C-O-C number : 39228</p> <p>Site : Learmonth SD - [REDACTED]</p> <p>Sampler : [REDACTED]</p> | <p>Laboratory : Environmental Division Perth</p> <p>Contact : [REDACTED]</p> <p>Address : 26 Rigali Way Wangara Western<br/>Australia Australia 6065</p> <p>E-mail : [REDACTED]@alsglobal.com</p> <p>Telephone : +6138549 9609</p> <p>Facsimile : +61-8-9406 1399</p> <p>Page : 1 of 2</p> <p>Quote number : ES2022MWHAUS0002 (SY/139/19 B)</p> <p>QC Level : NEPM 2013 B3 &amp; ALS QC Standard</p> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Dates

|                                           |                                               |
|-------------------------------------------|-----------------------------------------------|
| Date Samples Received : 27-Jun-2022 11:40 | Issue Date : 28-Jun-2022                      |
| Client Requested Due : 08-Jul-2022        | Scheduled Reporting Date : <b>08-Jul-2022</b> |
| Date                                      |                                               |

### Delivery Details

|                            |                                              |
|----------------------------|----------------------------------------------|
| Mode of Delivery : Carrier | Security Seal : Not Available                |
| No. of coolers/boxes : 5   | Temperature : 13.4 - Ice present             |
| Receipt Detail :           | No. of samples received / analysed : 11 / 11 |

### General Comments

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



## Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exists.

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: SOIL

| Laboratory sample ID | Sampling date / time | Sample ID         | SOIL - EA055-103 Moisture Content | SOIL - EP231X (solids) PFAS - Full Suite (28 analytes) |
|----------------------|----------------------|-------------------|-----------------------------------|--------------------------------------------------------|
| EP2207733-001        | 22-Jun-2022 10:11    | 0960_SD123_220622 | ✓                                 | ✓                                                      |
| EP2207733-002        | 22-Jun-2022 10:11    | 0960_QC118_220622 | ✓                                 | ✓                                                      |
| EP2207733-003        | 22-Jun-2022 12:02    | 0960_SD200_220622 | ✓                                 | ✓                                                      |
| EP2207733-004        | 22-Jun-2022 12:30    | 0960_SD199_220622 | ✓                                 | ✓                                                      |
| EP2207733-005        | 22-Jun-2022 13:57    | 0960_SS198_220622 | ✓                                 | ✓                                                      |
| EP2207733-006        | 22-Jun-2022 14:07    | 0960_SS293_220622 | ✓                                 | ✓                                                      |
| EP2207733-007        | 22-Jun-2022 14:08    | 0960_QC122_220622 | ✓                                 | ✓                                                      |
| EP2207733-008        | 22-Jun-2022 14:18    | 0960_SS292_220622 | ✓                                 | ✓                                                      |
| EP2207733-009        | 22-Jun-2022 14:19    | 0960_SS291_220622 | ✓                                 | ✓                                                      |
| EP2207733-010        | 22-Jun-2022 14:51    | 0960_SS227_220622 | ✓                                 | ✓                                                      |
| EP2207733-011        | 22-Jun-2022 14:52    | 0960_QC123_220622 | ✓                                 | ✓                                                      |

## Proactive Holding Time Report

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

## Requested Deliverables

|                         |            |                                                                |       |                              |
|-------------------------|------------|----------------------------------------------------------------|-------|------------------------------|
| ██████████              | ██████████ | - A4 - AU Tax Invoice (INV)                                    | Email | ██████████@cardno.com.au     |
| <b>DERP LAB REPORTS</b> |            |                                                                |       |                              |
| ██████████              | ██████████ | - EDI Format - ESDAT (ESDAT)                                   | Email | derp.labreports@esdat.com.au |
| ██████████              | ██████████ | - *AU Certificate of Analysis - NATA (COA)                     | Email | ██████████@stantec.com       |
|                         |            | - *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)    | Email | ██████████@stantec.com       |
|                         |            | - *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)            | Email | ██████████@stantec.com       |
|                         |            | - A4 - AU Sample Receipt Notification - Environmental HT (SRN) | Email | ██████████@stantec.com       |
|                         |            | - Chain of Custody (CoC) (COC)                                 | Email | ██████████@stantec.com       |
|                         |            | - EDI Format - ESDAT (ESDAT)                                   | Email | ██████████@stantec.com       |
|                         |            | - EDI Format - XTab (XTAB)                                     | Email | ██████████@stantec.com       |

## CERTIFICATE OF ANALYSIS

**Work Order** : **EP2207733**  
**Client** : **STANTEC AUSTRALIA PTY LTD**  
**Contact** : [REDACTED]  
**Address** : GROUND FLOOR 226 ADELAIDE TERRACE  
 PERTH 6000  
**Telephone** : ----  
**Project** : WA\_0960\_PFASOMP  
**Order number** : pfas-omp Learmonth  
**C-O-C number** : 39228  
**Sampler** : [REDACTED]  
**Site** : Learmonth SD - [REDACTED]  
**Quote number** : SY/139/19 B  
**No. of samples received** : 11  
**No. of samples analysed** : 11

**Page** : 1 of 9  
**Laboratory** : Environmental Division Perth  
**Contact** : [REDACTED]  
**Address** : 26 Rigali Way Wangara Western Australia Australia 6065  
**Telephone** : +6138549 9609  
**Date Samples Received** : 27-Jun-2022 11:40  
**Date Analysis Commenced** : 04-Jul-2022  
**Issue Date** : 08-Jul-2022 11:14



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             |
|------------------------------------------------------------------------|------------------|------------------------------------|
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator | Sydney Inorganics, Smithfield, NSW |
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator | Sydney Organics, Smithfield, NSW   |





## 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.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- 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

|                                                    |            |        |       | 0960_SD123_220622 | 0960_QC118_220622 | 0960_SD200_220622 | 0960_SD199_220622 | 0960_SS198_220622 |
|----------------------------------------------------|------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                               |            |        |       | 22-Jun-2022 10:11 | 22-Jun-2022 10:11 | 22-Jun-2022 12:02 | 22-Jun-2022 12:30 | 22-Jun-2022 13:57 |
| Compound                                           | CAS Number | LOR    | Unit  | EP2207733-001     | EP2207733-002     | EP2207733-003     | EP2207733-004     | EP2207733-005     |
|                                                    |            |        |       | Result            | Result            | Result            | Result            | Result            |
| <b>EA055: Moisture Content (Dried @ 105-110°C)</b> |            |        |       |                   |                   |                   |                   |                   |
| Moisture Content                                   | ----       | 0.1    | %     | 15.5              | 13.3              | 23.8              | 33.5              | 17.0              |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>       |            |        |       |                   |                   |                   |                   |                   |
| 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            | <0.0002           | <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 | 0.0384            | 0.0313            | <0.0002           | <0.0002           | 0.0016            |
| Perfluorodecane sulfonic acid (PFDS)               | 335-77-3   | 0.0002 | mg/kg | 0.0016            | 0.0013            | <0.0002           | <0.0002           | <0.0002           |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>     |            |        |       |                   |                   |                   |                   |                   |
| 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 (PFTTrDA)                | 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           |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>         |            |        |       |                   |                   |                   |                   |                   |
| 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

|                                                           |                    |        |       | 0960_SD123_220622 | 0960_QC118_220622 | 0960_SD200_220622 | 0960_SD199_220622 | 0960_SS198_220622 |
|-----------------------------------------------------------|--------------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                      |                    |        |       | 22-Jun-2022 10:11 | 22-Jun-2022 10:11 | 22-Jun-2022 12:02 | 22-Jun-2022 12:30 | 22-Jun-2022 13:57 |
| Compound                                                  | CAS Number         | LOR    | Unit  | EP2207733-001     | EP2207733-002     | EP2207733-003     | EP2207733-004     | EP2207733-005     |
|                                                           |                    |        |       | Result            | Result            | Result            | Result            | Result            |
| <b>EP231C: Perfluoroalkyl Sulfonamides - Continued</b>    |                    |        |       |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>         |                    |        |       |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231P: PFAS Sums</b>                                  |                    |        |       |                   |                   |                   |                   |                   |
| Sum of PFAS                                               | ----               | 0.0002 | mg/kg | 0.0403            | 0.0326            | <0.0002           | <0.0002           | 0.0016            |
| Sum of PFHxS and PFOS                                     | 355-46-4/1763-23-1 | 0.0002 | mg/kg | 0.0387            | 0.0313            | <0.0002           | <0.0002           | 0.0016            |
| Sum of PFAS (WA DER List)                                 | ----               | 0.0002 | mg/kg | 0.0387            | 0.0313            | <0.0002           | <0.0002           | 0.0016            |
| <b>EP231S: PFAS Surrogate</b>                             |                    |        |       |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                 | ----               | 0.0002 | %     | 112               | 104               | 85.0              | 82.5              | 89.0              |
| 13C8-PFOA                                                 | ----               | 0.0002 | %     | 105               | 99.5              | 100               | 98.0              | 100               |



## Analytical Results

Sub-Matrix: SEDIMENT  
 (Matrix: SOIL)

Sample ID

|                                                    |            |        |       | 0960_SS293_220622 | 0960_QC122_220622 | 0960_SS292_220622 | 0960_SS291_220622 | 0960_SS227_220622 |
|----------------------------------------------------|------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                               |            |        |       | 22-Jun-2022 14:07 | 22-Jun-2022 14:08 | 22-Jun-2022 14:18 | 22-Jun-2022 14:19 | 22-Jun-2022 14:51 |
| Compound                                           | CAS Number | LOR    | Unit  | EP2207733-006     | EP2207733-007     | EP2207733-008     | EP2207733-009     | EP2207733-010     |
|                                                    |            |        |       | Result            | Result            | Result            | Result            | Result            |
| <b>EA055: Moisture Content (Dried @ 105-110°C)</b> |            |        |       |                   |                   |                   |                   |                   |
| Moisture Content                                   | ----       | 0.1    | %     | 36.0              | 35.9              | 13.8              | 20.3              | 17.2              |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>       |            |        |       |                   |                   |                   |                   |                   |
| 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 | 0.0035            | 0.0022            | 0.0004            | 0.0022            | 0.0041            |
| Perfluorodecane sulfonic acid (PFDS)               | 335-77-3   | 0.0002 | mg/kg | <0.0002           | <0.0002           | <0.0002           | <0.0002           | <0.0002           |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>     |            |        |       |                   |                   |                   |                   |                   |
| 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 (PFTTrDA)                | 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           |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>         |            |        |       |                   |                   |                   |                   |                   |
| 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

|                                                           |                    |        |       | 0960_SS293_220622 | 0960_QC122_220622 | 0960_SS292_220622 | 0960_SS291_220622 | 0960_SS227_220622 |
|-----------------------------------------------------------|--------------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                      |                    |        |       | 22-Jun-2022 14:07 | 22-Jun-2022 14:08 | 22-Jun-2022 14:18 | 22-Jun-2022 14:19 | 22-Jun-2022 14:51 |
| Compound                                                  | CAS Number         | LOR    | Unit  | EP2207733-006     | EP2207733-007     | EP2207733-008     | EP2207733-009     | EP2207733-010     |
|                                                           |                    |        |       | Result            | Result            | Result            | Result            | Result            |
| <b>EP231C: Perfluoroalkyl Sulfonamides - Continued</b>    |                    |        |       |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>         |                    |        |       |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231P: PFAS Sums</b>                                  |                    |        |       |                   |                   |                   |                   |                   |
| Sum of PFAS                                               | ----               | 0.0002 | mg/kg | 0.0035            | 0.0022            | 0.0004            | 0.0022            | 0.0041            |
| Sum of PFHxS and PFOS                                     | 355-46-4/1763-23-1 | 0.0002 | mg/kg | 0.0035            | 0.0022            | 0.0004            | 0.0022            | 0.0041            |
| Sum of PFAS (WA DER List)                                 | ----               | 0.0002 | mg/kg | 0.0035            | 0.0022            | 0.0004            | 0.0022            | 0.0041            |
| <b>EP231S: PFAS Surrogate</b>                             |                    |        |       |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                 | ----               | 0.0002 | %     | 97.5              | 99.0              | 89.0              | 106               | 91.5              |
| 13C8-PFOA                                                 | ----               | 0.0002 | %     | 93.5              | 99.5              | 98.5              | 100               | 104               |



## Analytical Results

Sub-Matrix: SEDIMENT  
 (Matrix: SOIL)

Sample ID

0960\_QC123\_220622

| Sampling date / time |            | 22-Jun-2022 14:52 |      | ----          | ----  | ----  | ----  |
|----------------------|------------|-------------------|------|---------------|-------|-------|-------|
| Compound             | CAS Number | LOR               | Unit | EP2207733-011 | ----- | ----- | ----- |
| Result               |            |                   |      | ----          | ----  | ----  | ----  |

### EA055: Moisture Content (Dried @ 105-110°C)

|                  |      |     |   |      |      |      |      |      |
|------------------|------|-----|---|------|------|------|------|------|
| Moisture Content | ---- | 0.1 | % | 18.7 | ---- | ---- | ---- | ---- |
|------------------|------|-----|---|------|------|------|------|------|

### 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 | 0.0081  | ---- | ---- | ---- | ---- |
| 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

0960\_QC123\_220622

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Sampling date / time

22-Jun-2022 14:52

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Compound

CAS Number

LOR

Unit

EP2207733-011

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Result

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### 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 | 0.0081 | ---- | ---- | ---- | ---- |
| Sum of PFHxS and PFOS     | 355-46-4/1763-23-1 | 0.0002 | mg/kg | 0.0081 | ---- | ---- | ---- | ---- |
| Sum of PFAS (WA DER List) | ----               | 0.0002 | mg/kg | 0.0081 | ---- | ---- | ---- | ---- |

### EP231S: PFAS Surrogate

|           |      |        |   |      |      |      |      |      |
|-----------|------|--------|---|------|------|------|------|------|
| 13C4-PFOS | ---- | 0.0002 | % | 93.5 | ---- | ---- | ---- | ---- |
| 13C8-PFOA | ---- | 0.0002 | % | 100  | ---- | ---- | ---- | ---- |



Page : 9 of 9  
Work Order : EP2207733  
Client : STANTEC AUSTRALIA PTY LTD  
Project : WA\_0960\_PFASOMP



## Surrogate Control Limits

| Sub-Matrix: <b>SEDIMENT</b>   |            | Recovery Limits (%) |      |
|-------------------------------|------------|---------------------|------|
| Compound                      | CAS Number | Low                 | High |
| <b>EP231S: PFAS Surrogate</b> |            |                     |      |
| <b>13C4-PFOS</b>              | ----       | 60                  | 120  |
| <b>13C8-PFOA</b>              | ----       | 60                  | 120  |

## Inter-Laboratory Testing

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

(SOIL) EP231A: Perfluoroalkyl Sulfonic Acids

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

(SOIL) EP231C: Perfluoroalkyl Sulfonamides

(SOIL) EP231B: Perfluoroalkyl Carboxylic Acids

(SOIL) EP231P: PFAS Sums

(SOIL) EP231S: PFAS Surrogate

(SOIL) EA055: Moisture Content (Dried @ 105-110°C)

## QUALITY CONTROL REPORT

|                         |                                                   |                         |                                                          |
|-------------------------|---------------------------------------------------|-------------------------|----------------------------------------------------------|
| Work Order              | : EP2207733                                       | Page                    | : 1 of 7                                                 |
| Client                  | : STANTEC AUSTRALIA PTY LTD                       | Laboratory              | : Environmental Division Perth                           |
| Contact                 | : [REDACTED]                                      | Contact                 | : [REDACTED]                                             |
| Address                 | : GROUND FLOOR 226 ADELAIDE TERRACE<br>PERTH 6000 | Address                 | : 26 Rigali Way Wangara Western Australia Australia 6065 |
| Telephone               | : ----                                            | Telephone               | : +6138549 9609                                          |
| Project                 | : WA_0960_PFASOMP                                 | Date Samples Received   | : 27-Jun-2022                                            |
| Order number            | : pfas-omp Learmonth                              | Date Analysis Commenced | : 04-Jul-2022                                            |
| C-O-C number            | : 39228                                           | Issue Date              | : 08-Jul-2022                                            |
| Sampler                 | : [REDACTED]                                      |                         |                                                          |
| Site                    | : Learmonth SD - [REDACTED]                       |                         |                                                          |
| Quote number            | : SY/139/19 B                                     |                         |                                                          |
| No. of samples received | : 11                                              |                         |                                                          |
| No. of samples analysed | : 11                                              |                         |                                                          |



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]  | LCMS Coordinator | Sydney Inorganics, Smithfield, NSW |
| [REDACTED]  | LCMS Coordinator | Sydney Organics, Smithfield, NSW   |



## 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**

| 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: 4437285) |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2207733-002                                                 | 0960_QC118_220622 | EA055: Moisture Content                        | ----       | 0.1                               | %     | 13.3            | 13.0             | 2.2     | 0% - 20%           |
| EP2207738-002                                                 | Anonymous         | EA055: Moisture Content                        | ----       | 0.1                               | %     | 29.0            | 29.5             | 1.9     | 0% - 20%           |
| EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4441881)       |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2207729-021                                                 | 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 | 0.0075          | 0.0081           | 7.8     | 0% - 20%           |
|                                                               |                   | EP231X: Perfluorodecane sulfonic acid (PFDS)   | 335-77-3   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
| EP2207733-010                                                 | 0960_SS227_220622 | 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 | 0.0041          | 0.0042           | 3.2     | 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: 4441881)     |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2207729-021                                                 | 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: 4441881) - continued |                   |                                                                   |            |                                   |       |                 |                  |         |                    |
| EP2207729-021                                                         | Anonymous         | EP231X: Perfluorotridecanoic acid (PFTTrDA)                       | 72629-94-8 | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                       |                   | EP231X: Perfluorotetradecanoic acid (PFTTeDA)                     | 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           |
| EP2207733-010                                                         | 0960_SS227_220622 | 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 (PFTTeDA)                     | 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: 4441881)                 |                   |                                                                   |            |                                   |       |                 |                  |         |                    |
| EP2207729-021                                                         | 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           |
| EP2207733-010                                                         | 0960_SS227_220622 | 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           |

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 Work Order : EP2207733  
 Client : STANTEC AUSTRALIA PTY LTD  
 Project : WA\_0960\_PFASOMP



| Sub-Matrix: <b>SOIL</b>                                             |                   |                                                     |             | Laboratory Duplicate (DUP) Report |       |                 |                  |         |                    |
|---------------------------------------------------------------------|-------------------|-----------------------------------------------------|-------------|-----------------------------------|-------|-----------------|------------------|---------|--------------------|
| Laboratory sample ID                                                | Sample ID         | Method: Compound                                    | CAS Number  | LOR                               | Unit  | Original Result | Duplicate Result | RPD (%) | Acceptable RPD (%) |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4441881)</b> |                   |                                                     |             |                                   |       |                 |                  |         |                    |
| EP2207729-021                                                       | 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           |
| EP2207733-010                                                       | 0960_SS227_220622 | 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           |



## 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**

| Sub-Matrix: SOIL                                                  |             |        |       | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                        |     |
|-------------------------------------------------------------------|-------------|--------|-------|-----------------------------|---------------------------------------|---------------------------|----------------------------------------|-----|
|                                                                   |             |        |       |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low      High |     |
| Method: Compound                                                  | CAS Number  | LOR    | Unit  | Result                      |                                       |                           |                                        |     |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4441881)            |             |        |       |                             |                                       |                           |                                        |     |
| EP231X: Perfluorobutane sulfonic acid (PFBS)                      | 375-73-5    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 92.0                      | 72.0                                   | 128 |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)                    | 2706-91-4   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 112                       | 73.0                                   | 123 |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)                     | 355-46-4    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 100                       | 67.0                                   | 130 |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)                    | 375-92-8    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 113                       | 70.0                                   | 132 |
| EP231X: Perfluorooctane sulfonic acid (PFOS)                      | 1763-23-1   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 113                       | 68.0                                   | 136 |
| EP231X: Perfluorodecane sulfonic acid (PFDS)                      | 335-77-3    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 105                       | 59.0                                   | 134 |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4441881)          |             |        |       |                             |                                       |                           |                                        |     |
| EP231X: Perfluorobutanoic acid (PFBA)                             | 375-22-4    | 0.001  | mg/kg | <0.001                      | 0.00625 mg/kg                         | 97.4                      | 71.0                                   | 135 |
| EP231X: Perfluoropentanoic acid (PFPeA)                           | 2706-90-3   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 106                       | 69.0                                   | 132 |
| EP231X: Perfluorohexanoic acid (PFHxA)                            | 307-24-4    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 114                       | 70.0                                   | 132 |
| EP231X: Perfluoroheptanoic acid (PFHpA)                           | 375-85-9    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 113                       | 71.0                                   | 131 |
| EP231X: Perfluorooctanoic acid (PFOA)                             | 335-67-1    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 114                       | 69.0                                   | 133 |
| EP231X: Perfluorononanoic acid (PFNA)                             | 375-95-1    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 116                       | 72.0                                   | 129 |
| EP231X: Perfluorodecanoic acid (PFDA)                             | 335-76-2    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 117                       | 69.0                                   | 133 |
| EP231X: Perfluoroundecanoic acid (PFUnDA)                         | 2058-94-8   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 114                       | 64.0                                   | 136 |
| EP231X: Perfluorododecanoic acid (PFDoDA)                         | 307-55-1    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 115                       | 69.0                                   | 135 |
| EP231X: Perfluorotridecanoic acid (PFTrDA)                        | 72629-94-8  | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 110                       | 66.0                                   | 139 |
| EP231X: Perfluorotetradecanoic acid (PFTeDA)                      | 376-06-7    | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 106                       | 69.0                                   | 133 |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4441881)              |             |        |       |                             |                                       |                           |                                        |     |
| EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 126                       | 67.0                                   | 137 |
| EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 122                       | 71.6                                   | 129 |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 99.4                      | 69.8                                   | 131 |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 129                       | 68.7                                   | 130 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 108                       | 65.1                                   | 134 |
| 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                         | 78.4                      | 61.0                                   | 139 |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4441881)       |             |        |       |                             |                                       |                           |                                        |     |
| EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.0005 | mg/kg | <0.0005                     | 0.00125 mg/kg                         | 75.6                      | 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                         | 109                       | 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                         | 81.2                      | 65.0                                   | 137 |



| Sub-Matrix: SOIL                                                        |             |        |       | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                    |                       |      |
|-------------------------------------------------------------------------|-------------|--------|-------|-----------------------------|---------------------------------------|--------------------|-----------------------|------|
| Method: Compound                                                        | CAS Number  | LOR    | Unit  |                             | Spike                                 | Spike Recovery (%) | Acceptable Limits (%) |      |
|                                                                         |             |        |       |                             | Concentration                         | LCS                | Low                   | High |
|                                                                         |             |        |       |                             |                                       |                    |                       |      |
|                                                                         |             |        |       |                             |                                       |                    |                       |      |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4441881) - continued |             |        |       |                             |                                       |                    |                       |      |
| EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)                     | 120226-60-0 | 0.0005 | mg/kg | <0.0005                     | 0.00125 mg/kg                         | 75.2               | 69.2                  | 143  |

## 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                                         |           |                                                              |            | 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: 4441881)   |           |                                                              |            |                          |                  |                       |      |
| EP2207729-021                                            | Anonymous | EP231X: Perfluorobutane sulfonic acid (PFBS)                 | 375-73-5   | 0.00125 mg/kg            | 100              | 72.0                  | 128  |
|                                                          |           | EP231X: Perfluoropentane sulfonic acid (PFPeS)               | 2706-91-4  | 0.00125 mg/kg            | 92.4             | 73.0                  | 123  |
|                                                          |           | EP231X: Perfluorohexane sulfonic acid (PFHxS)                | 355-46-4   | 0.00125 mg/kg            | 97.2             | 67.0                  | 130  |
|                                                          |           | EP231X: Perfluoroheptane sulfonic acid (PFHpS)               | 375-92-8   | 0.00125 mg/kg            | 112              | 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            | 114              | 59.0                  | 134  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4441881) |           |                                                              |            |                          |                  |                       |      |
| EP2207729-021                                            | Anonymous | EP231X: Perfluorobutanoic acid (PFBA)                        | 375-22-4   | 0.00625 mg/kg            | 82.2             | 71.0                  | 135  |
|                                                          |           | EP231X: Perfluoropentanoic acid (PFPeA)                      | 2706-90-3  | 0.00125 mg/kg            | 108              | 69.0                  | 132  |
|                                                          |           | EP231X: Perfluorohexanoic acid (PFHxA)                       | 307-24-4   | 0.00125 mg/kg            | 111              | 70.0                  | 132  |
|                                                          |           | EP231X: Perfluoroheptanoic acid (PFHpA)                      | 375-85-9   | 0.00125 mg/kg            | 122              | 71.0                  | 131  |
|                                                          |           | EP231X: Perfluorooctanoic acid (PFOA)                        | 335-67-1   | 0.00125 mg/kg            | 115              | 69.0                  | 133  |
|                                                          |           | EP231X: Perfluorononanoic acid (PFNA)                        | 375-95-1   | 0.00125 mg/kg            | 113              | 72.0                  | 129  |
|                                                          |           | EP231X: Perfluorodecanoic acid (PFDA)                        | 335-76-2   | 0.00125 mg/kg            | 113              | 69.0                  | 133  |
|                                                          |           | EP231X: Perfluoroundecanoic acid (PFUnDA)                    | 2058-94-8  | 0.00125 mg/kg            | 119              | 64.0                  | 136  |
|                                                          |           | EP231X: Perfluorododecanoic acid (PFDoDA)                    | 307-55-1   | 0.00125 mg/kg            | 118              | 69.0                  | 135  |
|                                                          |           | EP231X: Perfluorotridecanoic acid (PFTrDA)                   | 72629-94-8 | 0.00125 mg/kg            | 118              | 66.0                  | 139  |
|                                                          |           | EP231X: Perfluorotetradecanoic acid (PFTeDA)                 | 376-06-7   | 0.00312 mg/kg            | 106              | 69.0                  | 133  |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4441881)     |           |                                                              |            |                          |                  |                       |      |
| EP2207729-021                                            | Anonymous | EP231X: Perfluorooctane sulfonamide (FOSA)                   | 754-91-6   | 0.00125 mg/kg            | 125              | 67.0                  | 137  |
|                                                          |           | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)        | 31506-32-8 | 0.00312 mg/kg            | 114              | 71.6                  | 129  |
|                                                          |           | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)         | 4151-50-2  | 0.00312 mg/kg            | 97.1             | 69.8                  | 131  |
|                                                          |           | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE) | 24448-09-7 | 0.00312 mg/kg            | 117              | 68.7                  | 130  |
|                                                          |           | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)  | 1691-99-2  | 0.00312 mg/kg            | 110              | 65.1                  | 134  |



Page : 7 of 7  
 Work Order : EP2207733  
 Client : STANTEC AUSTRALIA PTY LTD  
 Project : WA\_0960\_PFASOMP



Sub-Matrix: **SOIL**

| 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: 4441881) - continued |           |                                                                   |             |                          |                  |                       |      |
| EP2207729-021                                                    | Anonymous | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9   | 0.00125 mg/kg            | 118              | 63.0                  | 144  |
|                                                                  |           | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.00125 mg/kg            | 91.2             | 61.0                  | 139  |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4441881)      |           |                                                                   |             |                          |                  |                       |      |
| EP2207729-021                                                    | Anonymous | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.00125 mg/kg            | 112              | 62.0                  | 145  |
|                                                                  |           | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 27619-97-2  | 0.00125 mg/kg            | 127              | 64.0                  | 140  |
|                                                                  |           | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | 39108-34-4  | 0.00125 mg/kg            | 128              | 65.0                  | 137  |
|                                                                  |           | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | 120226-60-0 | 0.00125 mg/kg            | 122              | 69.2                  | 143  |

## QA/QC Compliance Assessment to assist with Quality Review

|              |                             |                         |                                |
|--------------|-----------------------------|-------------------------|--------------------------------|
| Work Order   | : EP2207733                 | Page                    | : 1 of 5                       |
| Client       | : STANTEC AUSTRALIA PTY LTD | Laboratory              | : Environmental Division Perth |
| Contact      | : [REDACTED]                | Telephone               | : +6138549 9609                |
| Project      | : WA_0960_PFASOMP           | Date Samples Received   | : 27-Jun-2022                  |
| Site         | : Learmonth SD - [REDACTED] | Issue Date              | : 08-Jul-2022                  |
| Sampler      | : [REDACTED]                | No. of samples received | : 11                           |
| Order number | : pfas-omp Learmonth        | No. of samples analysed | : 11                           |

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

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

### Summary of Outliers

#### Outliers : Quality Control Samples

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

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

#### Outliers : Analysis Holding Time Compliance

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

#### Outliers : Frequency of Quality Control Samples

- **NO** Quality Control Sample Frequency Outliers exist.



### Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

| Compound Group Name                   | Laboratory Sample ID | Client Sample ID | Analyte                              | CAS Number | Data           | Limits | Comment                                                                               |
|---------------------------------------|----------------------|------------------|--------------------------------------|------------|----------------|--------|---------------------------------------------------------------------------------------|
| <b>Matrix Spike (MS) Recoveries</b>   |                      |                  |                                      |            |                |        |                                                                                       |
| EP231A: Perfluoroalkyl Sulfonic Acids | EP2207729--021       | Anonymous        | Perfluorooctane sulfonic acid (PFOS) | 1763-23-1  | Not Determined | ----   | MS recovery not determined, background level greater than or equal to 4x spike level. |

### Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                                                                                                                                    | Sample Date                                                                                                | Extraction / Preparation |                    |             | Analysis      |                  |             |   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|--------------------------|--------------------|-------------|---------------|------------------|-------------|---|
| Container / Client Sample ID(s)                                                                                                                           |                                                                                                            | Date extracted           | Due for extraction | Evaluation  | Date analysed | Due for analysis | Evaluation  |   |
| EA055: Moisture Content (Dried @ 105-110°C)                                                                                                               |                                                                                                            |                          |                    |             |               |                  |             |   |
| HDPE Soil Jar (EA055)<br>0960_SD123_220622,<br>0960_SD200_220622,<br>0960_SS198_220622,<br>0960_QC122_220622,<br>0960_SS291_220622,<br>0960_QC123_220622  | 0960_QC118_220622,<br>0960_SD199_220622,<br>0960_SS293_220622,<br>0960_SS292_220622,<br>0960_SS227_220622, | 22-Jun-2022              | ----               | ----        | ----          | 04-Jul-2022      | 06-Jul-2022 | ✓ |
| EP231A: Perfluoroalkyl Sulfonic Acids                                                                                                                     |                                                                                                            |                          |                    |             |               |                  |             |   |
| HDPE Soil Jar (EP231X)<br>0960_SD123_220622,<br>0960_SD200_220622,<br>0960_SS198_220622,<br>0960_QC122_220622,<br>0960_SS291_220622,<br>0960_QC123_220622 | 0960_QC118_220622,<br>0960_SD199_220622,<br>0960_SS293_220622,<br>0960_SS292_220622,<br>0960_SS227_220622, | 22-Jun-2022              | 06-Jul-2022        | 19-Dec-2022 | ✓             | 07-Jul-2022      | 15-Aug-2022 | ✓ |
| EP231B: Perfluoroalkyl Carboxylic Acids                                                                                                                   |                                                                                                            |                          |                    |             |               |                  |             |   |
| HDPE Soil Jar (EP231X)<br>0960_SD123_220622,<br>0960_SD200_220622,<br>0960_SS198_220622,<br>0960_QC122_220622,<br>0960_SS291_220622,<br>0960_QC123_220622 | 0960_QC118_220622,<br>0960_SD199_220622,<br>0960_SS293_220622,<br>0960_SS292_220622,<br>0960_SS227_220622, | 22-Jun-2022              | 06-Jul-2022        | 19-Dec-2022 | ✓             | 07-Jul-2022      | 15-Aug-2022 | ✓ |

Page : 3 of 5  
 Work Order : EP2207733  
 Client : STANTEC AUSTRALIA PTY LTD  
 Project : WA\_0960\_PFASOMP



Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                     |                    | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |
|--------------------------------------------|--------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|
| Container / Client Sample ID(s)            |                    |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| EP231C: Perfluoroalkyl Sulfonamides        |                    |             |                          |                    |            |               |                  |            |
| HDPE Soil Jar (EP231X)                     |                    | 22-Jun-2022 | 06-Jul-2022              | 19-Dec-2022        | ✓          | 07-Jul-2022   | 15-Aug-2022      | ✓          |
| 0960_SD123_220622,                         | 0960_QC118_220622, |             |                          |                    |            |               |                  |            |
| 0960_SD200_220622,                         | 0960_SD199_220622, |             |                          |                    |            |               |                  |            |
| 0960_SS198_220622,                         | 0960_SS293_220622, |             |                          |                    |            |               |                  |            |
| 0960_QC122_220622,                         | 0960_SS292_220622, |             |                          |                    |            |               |                  |            |
| 0960_SS291_220622,                         | 0960_SS227_220622, |             |                          |                    |            |               |                  |            |
| 0960_QC123_220622                          |                    |             |                          |                    |            |               |                  |            |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids |                    |             |                          |                    |            |               |                  |            |
| HDPE Soil Jar (EP231X)                     |                    | 22-Jun-2022 | 06-Jul-2022              | 19-Dec-2022        | ✓          | 07-Jul-2022   | 15-Aug-2022      | ✓          |
| 0960_SD123_220622,                         | 0960_QC118_220622, |             |                          |                    |            |               |                  |            |
| 0960_SD200_220622,                         | 0960_SD199_220622, |             |                          |                    |            |               |                  |            |
| 0960_SS198_220622,                         | 0960_SS293_220622, |             |                          |                    |            |               |                  |            |
| 0960_QC122_220622,                         | 0960_SS292_220622, |             |                          |                    |            |               |                  |            |
| 0960_SS291_220622,                         | 0960_SS227_220622, |             |                          |                    |            |               |                  |            |
| 0960_QC123_220622                          |                    |             |                          |                    |            |               |                  |            |
| EP231P: PFAS Sums                          |                    |             |                          |                    |            |               |                  |            |
| HDPE Soil Jar (EP231X)                     |                    | 22-Jun-2022 | 06-Jul-2022              | 19-Dec-2022        | ✓          | 07-Jul-2022   | 15-Aug-2022      | ✓          |
| 0960_SD123_220622,                         | 0960_QC118_220622, |             |                          |                    |            |               |                  |            |
| 0960_SD200_220622,                         | 0960_SD199_220622, |             |                          |                    |            |               |                  |            |
| 0960_SS198_220622,                         | 0960_SS293_220622, |             |                          |                    |            |               |                  |            |
| 0960_QC122_220622,                         | 0960_SS292_220622, |             |                          |                    |            |               |                  |            |
| 0960_SS291_220622,                         | 0960_SS227_220622, |             |                          |                    |            |               |                  |            |
| 0960_QC123_220622                          |                    |             |                          |                    |            |               |                  |            |



## Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

| Quality Control Sample Type                          |        | Count |         | Rate (%) |          |            | Quality Control Specification  |
|------------------------------------------------------|--------|-------|---------|----------|----------|------------|--------------------------------|
| Analytical Methods                                   | Method | QC    | Regular | Actual   | Expected | Evaluation |                                |
|                                                      |        |       |         |          |          |            |                                |
| Laboratory Duplicates (DUP)                          |        |       |         |          |          |            |                                |
| Moisture Content                                     | EA055  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Laboratory Control Samples (LCS)                     |        |       |         |          |          |            |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Method Blanks (MB)                                   |        |       |         |          |          |            |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Matrix Spikes (MS)                                   |        |       |         |          |          |            |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |



## Brief Method Summaries

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

| <i>Analytical Methods</i>                            | <i>Method</i> | <i>Matrix</i> | <i>Method Descriptions</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------------------------------|---------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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. |
| <i>Preparation Methods</i>                           | <i>Method</i> | <i>Matrix</i> | <i>Method Descriptions</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| QuEChERS Extraction of Solids                        | ORG71         | SOIL          | In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.                                                                                                                                                                                                                                   |



# CHAIN OF CUSTODY

COC#: 39236

ALS Laboratory: EP Perth

CLIENT: MWHHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: Learmonth GW - AG

ORDER NO: pfas-omp Learmonth

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:

## SAMPLE DETAILS

## ANALYSIS REQUIRED

| SAMPLE | NAME       | DESCRIPTION | DATE / TIME         | MATRIX | TOTAL BOTTLES        | ON HOLD | Ground Waters WATER | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|------------|-------------|---------------------|--------|----------------------|---------|---------------------|----------------------|------------------------|
| 001    | 0960_MW168 |             | 22/06/2022 08:38 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |                      |                        |
| 002    | 0960_MW167 |             | 22/06/2022 08:56 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |                      |                        |
| 003    | 0960_MW166 |             | 22/06/2022 09:22 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |                      |                        |
| 004    | 0960_QC115 |             | 22/06/2022 09:23 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |                      |                        |
| 005    | 0960_MW112 |             | 22/06/2022 09:44 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |                      |                        |
| 006    | 0960_MW115 |             | 22/06/2022 10:00 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |                      |                        |
| 007    | 0960_MW165 |             | 22/06/2022 10:32 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |                      |                        |
| 008    | 0960_MW164 |             | 22/06/2022 10:57 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |                      |                        |
| 009    | 0960_QC120 |             | 22/06/2022 10:57 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |                      |                        |





# CHAIN OF CUSTODY

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ORDER NO: pfas-omp Learmonth

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:

## SAMPLE DETAILS

## ANALYSIS REQUIRED

| SAMPLE | NAME               | DESCRIPTION | DATE / TIME         | MATRIX | TOTAL BOTTLES        | ON HOLD | Ground Waters WATER | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION          |
|--------|--------------------|-------------|---------------------|--------|----------------------|---------|---------------------|----------------------|---------------------------------|
| 010    | 0960_MW163         |             | 22/06/2022 11:17 AM | Water  | ALS: 5<br>Non ALS: 0 | No      | Partial 4/8         |                      | extra PFAS bottles for lab qacc |
| 011    | 0960_MW211         |             | 22/06/2022 11:33 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |                      |                                 |
| 012    | 0960_MW179_1-1.5   |             | 22/06/2022 12:19 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |                      |                                 |
| 013    | 0960_MW137_0.8-1.3 |             | 22/06/2022 01:00 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |                      |                                 |



# CHAIN OF CUSTODY

COC#: 39236

ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: Learmonth GW - AG

ORDER NO: pfas-omp Learmonth

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:

| SAMPLE | SAMPLE NAME | PARTIAL ANALYSIS GROUP NAME | MATRIX | SELECTED ANALYSIS NAME                                                                                                                                                                                      |
|--------|-------------|-----------------------------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 001    | 0960_MW168  | Ground Waters WATER         | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 002    | 0960_MW167  | Ground Waters WATER         | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 003    | 0960_MW166  | Ground Waters WATER         | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 004    | 0960_QC115  | Ground Waters WATER         | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 005    | 0960_MW112  | Ground Waters WATER         | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 006    | 0960_MW115  | Ground Waters WATER         | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 007    | 0960_MW165  | Ground Waters WATER         | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 008    | 0960_MW164  | Ground Waters WATER         | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 009    | 0960_QC120  | Ground Waters WATER         | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |



# CHAIN OF CUSTODY

COC#: 39236

ALS Laboratory: EP Perth

CLIENT: MWHHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: Learmonth GW - AG

ORDER NO: pfas-omp Learmonth

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:

|     |                    |                     |       |                                                                                                                                                                                                                                                                                |
|-----|--------------------|---------------------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 010 | 0960_MW103         | Ground Waters WATER | Water | <ul style="list-style-type: none"><li>- NT-02 Major Anions (Chloride, Sulphate, Alkalinity)</li><li>- NT-01 Major Cations (Ca, Mg, Na, K)</li><li>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &amp; ED093F</li><li>- EP231X PFAS - Full Suite (28 analytes)</li></ul> |
| 011 | 0960_MW211         | Ground Waters WATER | Water | <ul style="list-style-type: none"><li>- NT-02 Major Anions (Chloride, Sulphate, Alkalinity)</li><li>- NT-01 Major Cations (Ca, Mg, Na, K)</li><li>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &amp; ED093F</li><li>- EP231X PFAS - Full Suite (28 analytes)</li></ul> |
| 012 | 0960_MW179_1-1.5   | Ground Waters WATER | Water | <ul style="list-style-type: none"><li>- NT-02 Major Anions (Chloride, Sulphate, Alkalinity)</li><li>- NT-01 Major Cations (Ca, Mg, Na, K)</li><li>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &amp; ED093F</li><li>- EP231X PFAS - Full Suite (28 analytes)</li></ul> |
| 013 | 0960_MW137_0.8-1.3 | Ground Waters WATER | Water | <ul style="list-style-type: none"><li>- NT-02 Major Anions (Chloride, Sulphate, Alkalinity)</li><li>- NT-01 Major Cations (Ca, Mg, Na, K)</li><li>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &amp; ED093F</li><li>- EP231X PFAS - Full Suite (28 analytes)</li></ul> |



# CHAIN OF CUSTODY

COC#: 39236

ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: Learmonth GW - AG

ORDER NO: pfas-omp Learmonth

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:

| SAMPLE | SAMPLE NAME | BOTTLE NAME                    | VOLUME | BARCODE        | TYPE  | FILTERED | REASON |
|--------|-------------|--------------------------------|--------|----------------|-------|----------|--------|
| 001    | 0960_MW168  | Clear Plastic Bottle - Natural | 500 mL | 00070621089907 | Green | No       |        |
| 001    | 0960_MW168  | HDPE (no PTFE)                 | 20 mL  | 00350821023765 | Grey  | No       |        |
| 001    | 0960_MW168  | HDPE (no PTFE)                 | 20 mL  | 00350821023854 | Grey  | No       |        |
| 002    | 0960_MW167  | HDPE (no PTFE)                 | 20 mL  | 00350821023827 | Grey  | No       |        |
| 002    | 0960_MW167  | HDPE (no PTFE)                 | 20 mL  | 00350821043210 | Grey  | No       |        |
| 002    | 0960_MW167  | Clear Plastic Bottle - Natural | 500 mL | 00070621089887 | Green | No       |        |
| 003    | 0960_MW166  | Clear Plastic Bottle - Natural | 500 mL | 00070621089888 | Green | No       |        |
| 003    | 0960_MW166  | HDPE (no PTFE)                 | 20 mL  | 00350821023763 | Grey  | No       |        |
| 003    | 0960_MW166  | HDPE (no PTFE)                 | 20 mL  | 00350821043240 | Grey  | No       |        |
| 004    | 0960_QC115  | Clear Plastic Bottle - Natural | 500 mL | 00070621089902 | Green | No       |        |
| 004    | 0960_QC115  | HDPE (no PTFE)                 | 20 mL  | 00350821023931 | Grey  | No       |        |
| 004    | 0960_QC115  | HDPE (no PTFE)                 | 20 mL  | 00350821043217 | Grey  | No       |        |
| 005    | 0960_MW112  | HDPE (no PTFE)                 | 20 mL  | 00350821023923 | Grey  | No       |        |
| 005    | 0960_MW112  | HDPE (no PTFE)                 | 20 mL  | 00350821023825 | Grey  | No       |        |
| 005    | 0960_MW112  | Clear Plastic Bottle - Natural | 500 mL | 00070621089891 | Green | No       |        |
| 006    | 0960_MW115  | HDPE (no PTFE)                 | 20 mL  | 00350821023747 | Grey  | No       |        |
| 006    | 0960_MW115  | HDPE (no PTFE)                 | 20 mL  | 00350821023917 | Grey  | No       |        |
| 006    | 0960_MW115  | Clear Plastic Bottle - Natural | 500 mL | 00070621089927 | Green | No       |        |
| 007    | 0960_MW165  | Clear Plastic Bottle - Natural | 500 mL | 00070621089921 | Green | No       |        |
| 007    | 0960_MW165  | HDPE (no PTFE)                 | 20 mL  | 00350821023753 | Grey  | No       |        |
| 007    | 0960_MW165  | HDPE (no PTFE)                 | 20 mL  | 00350821043214 | Grey  | No       |        |
| 008    | 0960_MW164  | Clear Plastic Bottle - Natural | 500 mL | 00070621089883 | Green | No       |        |
| 008    | 0960_MW164  | HDPE (no PTFE)                 | 20 mL  | 00350821023773 | Grey  | No       |        |
| 008    | 0960_MW164  | HDPE (no PTFE)                 | 20 mL  | 00350821043207 | Grey  | No       |        |
| 009    | 0960_QC120  | Clear Plastic Bottle - Natural | 500 mL | 00070621089883 | Green | No       |        |
| 009    | 0960_QC120  | HDPE (no PTFE)                 | 20 mL  | 00350821043213 | Grey  | No       |        |



# CHAIN OF CUSTODY

COC#: 39236

ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: Learmonth GW - AG

ORDER NO: pfas-omp Learmonth

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:

|     |                    |                                |        |                |       |    |  |
|-----|--------------------|--------------------------------|--------|----------------|-------|----|--|
| 009 | 0960_QC120         | HDPE (no PTFE)                 | 20 mL  | 00350821043243 | Grey  | No |  |
| 010 | 0960_MW163         | Clear Plastic Bottle - Natural | 500 mL | 00070621089896 | Green | No |  |
| 010 | 0960_MW163         | HDPE (no PTFE)                 | 20 mL  | 00350821023955 | Grey  | No |  |
| 010 | 0960_MW163         | HDPE (no PTFE)                 | 20 mL  | 00350821023756 | Grey  | No |  |
| 010 | 0960_MW163         | HDPE (no PTFE)                 | 20 mL  | 00350821023965 | Grey  | No |  |
| 010 | 0960_MW163         | HDPE (no PTFE)                 | 20 mL  | 00350821043202 | Grey  | No |  |
| 011 | 0960_MW211         | Clear Plastic Bottle - Natural | 500 mL | 00070621089945 | Green | No |  |
| 011 | 0960_MW211         | HDPE (no PTFE)                 | 20 mL  | 00350821024000 | Grey  | No |  |
| 011 | 0960_MW211         | HDPE (no PTFE)                 | 20 mL  | 00350821023807 | Grey  | No |  |
| 012 | 0960_MW179_1-1.5   | Clear Plastic Bottle - Natural | 500 mL | 00070621089944 | Green | No |  |
| 012 | 0960_MW179_1-1.5   | HDPE (no PTFE)                 | 20 mL  | 00350821023826 | Grey  | No |  |
| 012 | 0960_MW179_1-1.5   | HDPE (no PTFE)                 | 20 mL  | 00350821023863 | Grey  | No |  |
| 013 | 0960_MW137_0.8-1.3 | Clear Plastic Bottle - Natural | 500 mL | 00070621089645 | Green | No |  |
| 013 | 0960_MW137_0.8-1.3 | HDPE (no PTFE)                 | 20 mL  | 00350821023778 | Grey  | No |  |
| 013 | 0960_MW137_0.8-1.3 | HDPE (no PTFE)                 | 20 mL  | 00350821043224 | Grey  | No |  |

**Total Bottle Count: ALS: 41, Non ALS: 0**

**SAMPLE RECEIPT NOTIFICATION (SRN)****Work Order : EP2207737**

Client : **STANTEC AUSTRALIA PTY LTD**  
Contact : [REDACTED]  
Address : GROUND FLOOR 226 ADELAIDE  
TERRACE  
PERTH 6000

Laboratory : Environmental Division Perth  
Contact : [REDACTED]  
Address : 26 Rigali Way Wangara Western  
Australia Australia 6065

E-mail : [REDACTED]@stantec.com  
Telephone : ----  
Facsimile : ----

E-mail : [REDACTED]@alsglobal.com  
Telephone : +6138549 9609  
Facsimile : +61-8-9406 1399

Project : WA\_0960\_PFASOMP  
Order number : pfas-omp Learmonth  
C-O-C number : 39236  
Site : Learmonth GW - [REDACTED]  
Sampler : [REDACTED]

Page : 1 of 2  
Quote number : ES2022MWHAUS0002 (SY/139/19 B)  
QC Level : NEPM 2013 B3 & ALS QC Standard

**Dates**

Date Samples Received : 27-Jun-2022 11:40  
Client Requested Due : 08-Jul-2022  
Date

Issue Date : 28-Jun-2022  
Scheduled Reporting Date : **08-Jul-2022**

**Delivery Details**

Mode of Delivery : Carrier  
No. of coolers/boxes : 5  
Receipt Detail :

Security Seal : Not Available  
Temperature : 13.4 - Ice present  
No. of samples received / analysed : 13 / 13

**General Comments**

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

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

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

EP2207737-013 : 22-Jun-2022 13:00 : 0960\_MW137\_0.8-1.3\_220622

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

| Laboratory sample ID | Sampling date / time | Sample ID               | WATER<br>Ionic Ba | WATER<br>PFAS - | WATER<br>Major C | WATER<br>Major A |
|----------------------|----------------------|-------------------------|-------------------|-----------------|------------------|------------------|
| EP2207737-001        | 22-Jun-2022 08:38    | 0960_MW168_220622       | ✓                 | ✓               | ✓                | ✓                |
| EP2207737-002        | 22-Jun-2022 08:56    | 0960_MW167_220622       | ✓                 | ✓               | ✓                | ✓                |
| EP2207737-003        | 22-Jun-2022 09:22    | 0960_MW166_220622       | ✓                 | ✓               | ✓                | ✓                |
| EP2207737-004        | 22-Jun-2022 09:23    | 0960_QC115_220622       | ✓                 | ✓               | ✓                | ✓                |
| EP2207737-005        | 22-Jun-2022 09:44    | 0960_MW112_220622       | ✓                 | ✓               | ✓                | ✓                |
| EP2207737-006        | 22-Jun-2022 10:00    | 0960_MW115_220622       | ✓                 | ✓               | ✓                | ✓                |
| EP2207737-007        | 22-Jun-2022 10:32    | 0960_MW165_220622       | ✓                 | ✓               | ✓                | ✓                |
| EP2207737-008        | 22-Jun-2022 10:57    | 0960_MW164_220622       | ✓                 | ✓               | ✓                | ✓                |
| EP2207737-009        | 22-Jun-2022 10:57    | 0960_QC120_220622       | ✓                 | ✓               | ✓                | ✓                |
| EP2207737-010        | 22-Jun-2022 11:17    | 0960_MW163_220622       | ✓                 | ✓               | ✓                | ✓                |
| EP2207737-011        | 22-Jun-2022 11:33    | 0960_MW211_220622       | ✓                 | ✓               | ✓                | ✓                |
| EP2207737-012        | 22-Jun-2022 12:19    | 0960_MW179_1-1.5_220... | ✓                 | ✓               | ✓                | ✓                |
| EP2207737-013        | 22-Jun-2022 13:00    | 0960_MW137_0.8-1.3_2... | ✓                 | ✓               | ✓                | ✓                |

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

|                                                                |       |                              |
|----------------------------------------------------------------|-------|------------------------------|
| - A4 - AU Tax Invoice (INV)                                    | Email | [REDACTED]@cardno.com.au     |
| <b>DERP LAB REPORTS</b>                                        |       |                              |
| - EDI Format - ESDAT (ESDAT)                                   | Email | derp.labreports@esdat.com.au |
| - *AU Certificate of Analysis - NATA (COA)                     | Email | [REDACTED]@stantec.com       |
| - *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)    | Email | [REDACTED]@stantec.com       |
| - *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)            | Email | [REDACTED]@stantec.com       |
| - A4 - AU Sample Receipt Notification - Environmental HT (SRN) | Email | [REDACTED]@stantec.com       |
| - Chain of Custody (CoC)                                       | Email | [REDACTED]@stantec.com       |
| - EDI Format - ESDAT (ESDAT)                                   | Email | [REDACTED]@stantec.com       |
| - EDI Format - XTab (XTAB)                                     | Email | [REDACTED]@stantec.com       |



## CERTIFICATE OF ANALYSIS

**Work Order** : **EP2207737**  
**Client** : **STANTEC AUSTRALIA PTY LTD**  
**Contact** : [REDACTED]  
**Address** : GROUND FLOOR 226 ADELAIDE TERRACE  
 PERTH 6000  
**Telephone** : ----  
**Project** : WA\_0960\_PFASOMP  
**Order number** : pfas-omp Learmonth  
**C-O-C number** : 39236  
**Sampler** : [REDACTED]  
**Site** : Learmonth GW - [REDACTED]  
**Quote number** : SY/139/19 B  
**No. of samples received** : 13  
**No. of samples analysed** : 13

**Page** : 1 of 12  
**Laboratory** : Environmental Division Perth  
**Contact** : [REDACTED]  
**Address** : 26 Rigali Way Wangara Western Australia Australia 6065  
**Telephone** : +6138549 9609  
**Date Samples Received** : 27-Jun-2022 11:40  
**Date Analysis Commenced** : 28-Jun-2022  
**Issue Date** : 11-Jul-2022 14:38



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>                |
|------------------------------------------------------------------------|----------------------------|----------------------------------------------|
| Canhuang Ke                                                            | Inorganics Supervisor      | Perth Inorganics, Wangara, Western Australia |
| <span style="background-color: black; color: black;">[REDACTED]</span> | Laboratory Manager (Perth) | Perth Inorganics, Wangara, Western Australia |
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator           | Sydney Organics, Smithfield, NSW             |



## 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.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- 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.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, 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: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                        |             |      |       | 0960_MW168_220622 | 0960_MW167_220622 | 0960_MW166_220622 | 0960_QC115_220622 | 0960_MW112_220622 |
|--------------------------------------------------------|-------------|------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                   |             |      |       | 22-Jun-2022 08:38 | 22-Jun-2022 08:56 | 22-Jun-2022 09:22 | 22-Jun-2022 09:23 | 22-Jun-2022 09:44 |
| Compound                                               | CAS Number  | LOR  | Unit  | EP2207737-001     | EP2207737-002     | EP2207737-003     | EP2207737-004     | EP2207737-005     |
|                                                        |             |      |       | Result            | Result            | Result            | Result            | Result            |
| <b>ED037P: Alkalinity by PC Titrator</b>               |             |      |       |                   |                   |                   |                   |                   |
| Hydroxide Alkalinity as CaCO3                          | DMO-210-001 | 1    | mg/L  | <1                | <1                | <1                | <1                | <1                |
| Carbonate Alkalinity as CaCO3                          | 3812-32-6   | 1    | mg/L  | <1                | <1                | <1                | <1                | <1                |
| Bicarbonate Alkalinity as CaCO3                        | 71-52-3     | 1    | mg/L  | 603               | 917               | 942               | 930               | 755               |
| Total Alkalinity as CaCO3                              | ----        | 1    | mg/L  | 603               | 917               | 942               | 930               | 755               |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b> |             |      |       |                   |                   |                   |                   |                   |
| Sulfate as SO4 - Turbidimetric                         | 14808-79-8  | 1    | mg/L  | 681               | 324               | 95                | 92                | 1150              |
| <b>ED045G: Chloride by Discrete Analyser</b>           |             |      |       |                   |                   |                   |                   |                   |
| Chloride                                               | 16887-00-6  | 1    | mg/L  | 3580              | 950               | 342               | 349               | 3180              |
| <b>ED093F: Dissolved Major Cations</b>                 |             |      |       |                   |                   |                   |                   |                   |
| Calcium                                                | 7440-70-2   | 1    | mg/L  | 165               | 26                | 8                 | 8                 | 102               |
| Magnesium                                              | 7439-95-4   | 1    | mg/L  | 192               | 30                | 9                 | 9                 | 145               |
| Sodium                                                 | 7440-23-5   | 1    | mg/L  | 2200              | 977               | 555               | 557               | 2390              |
| Potassium                                              | 7440-09-7   | 1    | mg/L  | 109               | 48                | 27                | 28                | 116               |
| <b>EN055: Ionic Balance</b>                            |             |      |       |                   |                   |                   |                   |                   |
| ∅ Total Anions                                         | ----        | 0.01 | meq/L | 127               | 51.9              | 30.4              | 30.3              | 129               |
| ∅ Total Cations                                        | ----        | 0.01 | meq/L | 122               | 47.5              | 26.0              | 26.1              | 124               |
| ∅ Ionic Balance                                        | ----        | 0.01 | %     | 1.88              | 4.40              | 7.93              | 7.54              | 1.89              |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>           |             |      |       |                   |                   |                   |                   |                   |
| Perfluorobutane sulfonic acid (PFBS)                   | 375-73-5    | 0.02 | µg/L  | 0.04              | 0.04              | <0.02             | 0.03              | 0.03              |
| Perfluoropentane sulfonic acid (PFPeS)                 | 2706-91-4   | 0.02 | µg/L  | 0.05              | 0.06              | <0.02             | 0.02              | 0.05              |
| Perfluorohexane sulfonic acid (PFHxS)                  | 355-46-4    | 0.01 | µg/L  | 0.42              | 1.03              | 0.07              | 0.21              | 0.55              |
| 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  | 0.12              | 1.04              | 0.07              | 0.22              | 0.77              |
| Perfluorodecane sulfonic acid (PFDS)                   | 335-77-3    | 0.02 | µg/L  | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>         |             |      |       |                   |                   |                   |                   |                   |
| 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              | 0.10              | <0.02             | 0.06              | <0.02             |
| Perfluorohexanoic acid (PFHxA)                         | 307-24-4    | 0.02 | µg/L  | 0.12              | 0.24              | 0.03              | 0.09              | 0.10              |
| Perfluoroheptanoic acid (PFHpA)                        | 375-85-9    | 0.02 | µg/L  | 0.02              | 0.10              | <0.02             | 0.05              | <0.02             |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_MW168_220622 | 0960_MW167_220622 | 0960_MW166_220622 | 0960_QC115_220622 | 0960_MW112_220622 |
|------------------------------------------------------------|-------------|------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                       |             |      |      | 22-Jun-2022 08:38 | 22-Jun-2022 08:56 | 22-Jun-2022 09:22 | 22-Jun-2022 09:23 | 22-Jun-2022 09:44 |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2207737-001     | EP2207737-002     | EP2207737-003     | EP2207737-004     | EP2207737-005     |
|                                                            |             |      |      | Result            | Result            | Result            | Result            | Result            |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                   |                   |                   |                   |                   |
| Perfluorooctanoic acid (PFOA)                              | 335-67-1    | 0.01 | µg/L | 0.02              | 0.14              | 0.01              | 0.05              | 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             |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                   |                   |                   |                   |                   |
| Perfluorooctane sulfonamide (FOSA)                         | 754-91-6    | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)              | 31506-32-8  | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)               | 4151-50-2   | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)       | 24448-09-7  | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)        | 1691-99-2   | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)  | 2355-31-9   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)   | 2991-50-6   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                   |                   |                   |                   |                   |
| 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             |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_MW168_220622 | 0960_MW167_220622 | 0960_MW166_220622 | 0960_QC115_220622 | 0960_MW112_220622 |
|---------------------------------------------------------------|--------------------|------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                          |                    |      |      | 22-Jun-2022 08:38 | 22-Jun-2022 08:56 | 22-Jun-2022 09:22 | 22-Jun-2022 09:23 | 22-Jun-2022 09:44 |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2207737-001     | EP2207737-002     | EP2207737-003     | EP2207737-004     | EP2207737-005     |
|                                                               |                    |      |      | Result            | Result            | Result            | Result            | Result            |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                   |                   |                   |                   |                   |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                   |                   |                   |                   |                   |
| Sum of PFAS                                                   | ----               | 0.01 | µg/L | 0.83              | 2.80              | 0.18              | 0.73              | 1.52              |
| Sum of PFHxS and PFOS                                         | 355-46-4/1763-23-1 | 0.01 | µg/L | 0.54              | 2.07              | 0.14              | 0.43              | 1.32              |
| Sum of PFAS (WA DER List)                                     | ----               | 0.01 | µg/L | 0.78              | 2.69              | 0.18              | 0.71              | 1.47              |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 101               | 99.7              | 101               | 98.5              | 101               |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 82.8              | 88.9              | 89.1              | 102               | 87.4              |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                                   |             |      |       | 0960_MW115_220622 | 0960_MW165_220622 | 0960_MW164_220622 | 0960_QC120_220622 | 0960_MW163_220622 |
|-------------------------------------------------------------------|-------------|------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                              |             |      |       | 22-Jun-2022 10:00 | 22-Jun-2022 10:32 | 22-Jun-2022 10:57 | 22-Jun-2022 10:57 | 22-Jun-2022 11:17 |
| Compound                                                          | CAS Number  | LOR  | Unit  | EP2207737-006     | EP2207737-007     | EP2207737-008     | EP2207737-009     | EP2207737-010     |
|                                                                   |             |      |       | Result            | Result            | Result            | Result            | Result            |
| <b>ED037P: Alkalinity by PC Titrator</b>                          |             |      |       |                   |                   |                   |                   |                   |
| Hydroxide Alkalinity as CaCO <sub>3</sub>                         | DMO-210-001 | 1    | mg/L  | <1                | <1                | <1                | <1                | <1                |
| Carbonate Alkalinity as CaCO <sub>3</sub>                         | 3812-32-6   | 1    | mg/L  | <1                | <1                | <1                | <1                | <1                |
| Bicarbonate Alkalinity as CaCO <sub>3</sub>                       | 71-52-3     | 1    | mg/L  | 349               | 866               | 858               | 816               | 437               |
| Total Alkalinity as CaCO <sub>3</sub>                             | ----        | 1    | mg/L  | 349               | 866               | 858               | 816               | 437               |
| <b>ED041G: Sulfate (Turbidimetric) as SO<sub>4</sub> 2- by DA</b> |             |      |       |                   |                   |                   |                   |                   |
| Sulfate as SO <sub>4</sub> - Turbidimetric                        | 14808-79-8  | 1    | mg/L  | 1550              | 73                | 397               | 450               | 539               |
| <b>ED045G: Chloride by Discrete Analyser</b>                      |             |      |       |                   |                   |                   |                   |                   |
| Chloride                                                          | 16887-00-6  | 1    | mg/L  | 11900             | 503               | 2040              | 2290              | 3540              |
| <b>ED093F: Dissolved Major Cations</b>                            |             |      |       |                   |                   |                   |                   |                   |
| Calcium                                                           | 7440-70-2   | 1    | mg/L  | 494               | 6                 | 48                | 64                | 171               |
| Magnesium                                                         | 7439-95-4   | 1    | mg/L  | 715               | 9                 | 78                | 92                | 205               |
| Sodium                                                            | 7440-23-5   | 1    | mg/L  | 5720              | 592               | 1390              | 1510              | 2190              |
| Potassium                                                         | 7440-09-7   | 1    | mg/L  | 294               | 28                | 68                | 77                | 104               |
| <b>EN055: Ionic Balance</b>                                       |             |      |       |                   |                   |                   |                   |                   |
| ∅ Total Anions                                                    | ----        | 0.01 | meq/L | 375               | 33.0              | 83.0              | 90.3              | 120               |
| ∅ Total Cations                                                   | ----        | 0.01 | meq/L | 340               | 27.5              | 71.0              | 78.4              | 123               |
| ∅ Ionic Balance                                                   | ----        | 0.01 | %     | 4.91              | 9.10              | 7.75              | 7.03              | 1.44              |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>                      |             |      |       |                   |                   |                   |                   |                   |
| Perfluorobutane sulfonic acid (PFBS)                              | 375-73-5    | 0.02 | µg/L  | 0.17              | <0.02             | 0.37              | 0.38              | 0.14              |
| Perfluoropentane sulfonic acid (PFPeS)                            | 2706-91-4   | 0.02 | µg/L  | 0.20              | <0.02             | 0.48              | 0.48              | 0.19              |
| Perfluorohexane sulfonic acid (PFHxS)                             | 355-46-4    | 0.01 | µg/L  | 1.35              | 0.01              | 2.74              | 2.79              | 1.49              |
| Perfluoroheptane sulfonic acid (PFHpS)                            | 375-92-8    | 0.02 | µg/L  | 0.03              | <0.02             | 0.09              | 0.10              | 0.08              |
| Perfluorooctane sulfonic acid (PFOS)                              | 1763-23-1   | 0.01 | µg/L  | 0.27              | 0.02              | 0.94              | 1.01              | 0.70              |
| Perfluorodecane sulfonic acid (PFDS)                              | 335-77-3    | 0.02 | µg/L  | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>                    |             |      |       |                   |                   |                   |                   |                   |
| 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  | 0.06              | <0.02             | 0.25              | 0.26              | 0.11              |
| Perfluorohexanoic acid (PFHxA)                                    | 307-24-4    | 0.02 | µg/L  | 0.34              | <0.02             | 1.01              | 1.01              | 0.46              |
| Perfluoroheptanoic acid (PFHpA)                                   | 375-85-9    | 0.02 | µg/L  | 0.02              | <0.02             | 0.10              | 0.09              | 0.05              |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_MW115_220622 | 0960_MW165_220622 | 0960_MW164_220622 | 0960_QC120_220622 | 0960_MW163_220622 |
|------------------------------------------------------------|-------------|------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                       |             |      |      | 22-Jun-2022 10:00 | 22-Jun-2022 10:32 | 22-Jun-2022 10:57 | 22-Jun-2022 10:57 | 22-Jun-2022 11:17 |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2207737-006     | EP2207737-007     | EP2207737-008     | EP2207737-009     | EP2207737-010     |
|                                                            |             |      |      | Result            | Result            | Result            | Result            | Result            |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                   |                   |                   |                   |                   |
| Perfluorooctanoic acid (PFOA)                              | 335-67-1    | 0.01 | µg/L | 0.03              | <0.01             | 0.09              | 0.10              | 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             |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                   |                   |                   |                   |                   |
| Perfluorooctane sulfonamide (FOSA)                         | 754-91-6    | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)              | 31506-32-8  | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)               | 4151-50-2   | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)       | 24448-09-7  | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)        | 1691-99-2   | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)  | 2355-31-9   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)   | 2991-50-6   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                   |                   |                   |                   |                   |
| 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             |





## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_MW115_220622 | 0960_MW165_220622 | 0960_MW164_220622 | 0960_QC120_220622 | 0960_MW163_220622 |
|---------------------------------------------------------------|--------------------|------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                          |                    |      |      | 22-Jun-2022 10:00 | 22-Jun-2022 10:32 | 22-Jun-2022 10:57 | 22-Jun-2022 10:57 | 22-Jun-2022 11:17 |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2207737-006     | EP2207737-007     | EP2207737-008     | EP2207737-009     | EP2207737-010     |
|                                                               |                    |      |      | Result            | Result            | Result            | Result            | Result            |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                   |                   |                   |                   |                   |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                   |                   |                   |                   |                   |
| Sum of PFAS                                                   | ----               | 0.01 | µg/L | 2.47              | 0.03              | 6.17              | 6.32              | 3.28              |
| Sum of PFHxS and PFOS                                         | 355-46-4/1763-23-1 | 0.01 | µg/L | 1.62              | 0.03              | 3.68              | 3.80              | 6.29              |
| Sum of PFAS (WA DER List)                                     | ----               | 0.01 | µg/L | 2.24              | 0.03              | 5.60              | 5.74              | 8.36              |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 99.8              | 95.1              | 108               | 105               | 98.7              |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 82.3              | 86.0              | 89.9              | 86.2              | 98.5              |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                        |             |      |       | 0960_MW211_220622 | 0960_MW179_1-1.5_2<br>20622 | 0960_MW137_0.8-1.3<br>_220622 | ----  | ----  |
|--------------------------------------------------------|-------------|------|-------|-------------------|-----------------------------|-------------------------------|-------|-------|
| Sampling date / time                                   |             |      |       | 22-Jun-2022 11:33 | 22-Jun-2022 12:19           | 22-Jun-2022 13:00             | ----  | ----  |
| Compound                                               | CAS Number  | LOR  | Unit  | EP2207737-011     | EP2207737-012               | EP2207737-013                 | ----- | ----- |
| Result                                                 |             |      |       | Result            | Result                      | Result                        | ----  | ----  |
| <b>ED037P: Alkalinity by PC Titrator</b>               |             |      |       |                   |                             |                               |       |       |
| Hydroxide Alkalinity as CaCO3                          | DMO-210-001 | 1    | mg/L  | <1                | <1                          | <1                            | ----  | ----  |
| Carbonate Alkalinity as CaCO3                          | 3812-32-6   | 1    | mg/L  | 26                | <1                          | <1                            | ----  | ----  |
| Bicarbonate Alkalinity as CaCO3                        | 71-52-3     | 1    | mg/L  | 620               | 184                         | 252                           | ----  | ----  |
| Total Alkalinity as CaCO3                              | ----        | 1    | mg/L  | 646               | 184                         | 252                           | ----  | ----  |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b> |             |      |       |                   |                             |                               |       |       |
| Sulfate as SO4 - Turbidimetric                         | 14808-79-8  | 1    | mg/L  | 59                | 4140                        | 4200                          | ----  | ----  |
| <b>ED045G: Chloride by Discrete Analyser</b>           |             |      |       |                   |                             |                               |       |       |
| Chloride                                               | 16887-00-6  | 1    | mg/L  | 132               | 35300                       | 35700                         | ----  | ----  |
| <b>ED093F: Dissolved Major Cations</b>                 |             |      |       |                   |                             |                               |       |       |
| Calcium                                                | 7440-70-2   | 1    | mg/L  | 3                 | 676                         | 752                           | ----  | ----  |
| Magnesium                                              | 7439-95-4   | 1    | mg/L  | 5                 | 2430                        | 2720                          | ----  | ----  |
| Sodium                                                 | 7440-23-5   | 1    | mg/L  | 375               | 19100                       | 21000                         | ----  | ----  |
| Potassium                                              | 7440-09-7   | 1    | mg/L  | 18                | 994                         | 1080                          | ----  | ----  |
| <b>EN055: Ionic Balance</b>                            |             |      |       |                   |                             |                               |       |       |
| ∅ Total Anions                                         | ----        | 0.01 | meq/L | 17.8              | 1080                        | 1100                          | ----  | ----  |
| ∅ Total Cations                                        | ----        | 0.01 | meq/L | 17.3              | 1090                        | 1200                          | ----  | ----  |
| ∅ Ionic Balance                                        | ----        | 0.01 | %     | 1.49              | 0.20                        | 4.47                          | ----  | ----  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>           |             |      |       |                   |                             |                               |       |       |
| Perfluorobutane sulfonic acid (PFBS)                   | 375-73-5    | 0.02 | µg/L  | 0.08              | <0.02                       | <0.02                         | ----  | ----  |
| Perfluoropentane sulfonic acid (PFPeS)                 | 2706-91-4   | 0.02 | µg/L  | 0.09              | <0.02                       | <0.02                         | ----  | ----  |
| Perfluorohexane sulfonic acid (PFHxS)                  | 355-46-4    | 0.01 | µg/L  | 0.77              | <0.01                       | <0.01                         | ----  | ----  |
| Perfluoroheptane sulfonic acid (PFHpS)                 | 375-92-8    | 0.02 | µg/L  | 0.03              | <0.02                       | <0.02                         | ----  | ----  |
| Perfluorooctane sulfonic acid (PFOS)                   | 1763-23-1   | 0.01 | µg/L  | 4.24              | <0.01                       | <0.01                         | ----  | ----  |
| Perfluorodecane sulfonic acid (PFDS)                   | 335-77-3    | 0.02 | µg/L  | <0.02             | <0.02                       | <0.02                         | ----  | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>         |             |      |       |                   |                             |                               |       |       |
| 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  | 0.10              | <0.02                       | <0.02                         | ----  | ----  |
| Perfluorohexanoic acid (PFHxA)                         | 307-24-4    | 0.02 | µg/L  | 0.24              | <0.02                       | <0.02                         | ----  | ----  |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_MW211_220622 | 0960_MW179_1-1.5_2<br>20622 | 0960_MW137_0.8-1.3<br>_220622 | ----  | ----  |
|------------------------------------------------------------|-------------|------|------|-------------------|-----------------------------|-------------------------------|-------|-------|
| Sampling date / time                                       |             |      |      | 22-Jun-2022 11:33 | 22-Jun-2022 12:19           | 22-Jun-2022 13:00             | ----  | ----  |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2207737-011     | EP2207737-012               | EP2207737-013                 | ----- | ----- |
|                                                            |             |      |      | Result            | Result                      | Result                        | ----  | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                   |                             |                               |       |       |
| Perfluoroheptanoic acid (PFHpA)                            | 375-85-9    | 0.02 | µg/L | 0.05              | <0.02                       | <0.02                         | ----  | ----  |
| Perfluorooctanoic acid (PFOA)                              | 335-67-1    | 0.01 | µg/L | 0.05              | <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                         | ----  | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                   |                             |                               |       |       |
| 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                         | ----  | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                   |                             |                               |       |       |
| 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                         | ----  | ----  |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_MW211_220622 | 0960_MW179_1-1.5_2<br>20622 | 0960_MW137_0.8-1.3<br>_220622 | ----  | ----  |
|---------------------------------------------------------------|--------------------|------|------|-------------------|-----------------------------|-------------------------------|-------|-------|
| Sampling date / time                                          |                    |      |      | 22-Jun-2022 11:33 | 22-Jun-2022 12:19           | 22-Jun-2022 13:00             | ----  | ----  |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2207737-011     | EP2207737-012               | EP2207737-013                 | ----- | ----- |
|                                                               |                    |      |      | Result            | Result                      | Result                        | ----  | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                   |                             |                               |       |       |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05             | <0.05                       | <0.05                         | ----  | ----  |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                   |                             |                               |       |       |
| Sum of PFAS                                                   | ----               | 0.01 | µg/L | 5.65              | <0.01                       | <0.01                         | ----  | ----  |
| Sum of PFHxS and PFOS                                         | 355-46-4/1763-23-1 | 0.01 | µg/L | 5.01              | <0.01                       | <0.01                         | ----  | ----  |
| Sum of PFAS (WA DER List)                                     | ----               | 0.01 | µg/L | 5.53              | <0.01                       | <0.01                         | ----  | ----  |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                   |                             |                               |       |       |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 107               | 104                         | 100                           | ----  | ----  |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 86.4              | 88.0                        | 87.0                          | ----  | ----  |

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Client : STANTEC AUSTRALIA PTY LTD  
Project : WA\_0960\_PFASOMP



## Surrogate Control Limits

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

## Inter-Laboratory Testing

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

(WATER) EP231C: Perfluoroalkyl Sulfonamides

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

(WATER) EP231P: PFAS Sums

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231S: PFAS Surrogate

## QUALITY CONTROL REPORT

|                                |                                                           |                                |                                                                 |
|--------------------------------|-----------------------------------------------------------|--------------------------------|-----------------------------------------------------------------|
| <b>Work Order</b>              | <b>: EP2207737</b>                                        | <b>Page</b>                    | <b>: 1 of 7</b>                                                 |
| <b>Client</b>                  | <b>: STANTEC AUSTRALIA PTY LTD</b>                        | <b>Laboratory</b>              | <b>: Environmental Division Perth</b>                           |
| <b>Contact</b>                 | <b>: [REDACTED]</b>                                       | <b>Contact</b>                 | <b>: [REDACTED]</b>                                             |
| <b>Address</b>                 | <b>: GROUND FLOOR 226 ADELAIDE TERRACE<br/>PERTH 6000</b> | <b>Address</b>                 | <b>: 26 Rigali Way Wangara Western Australia Australia 6065</b> |
| <b>Telephone</b>               | <b>: ----</b>                                             | <b>Telephone</b>               | <b>: +6138549 9609</b>                                          |
| <b>Project</b>                 | <b>: WA_0960_PFASOMP</b>                                  | <b>Date Samples Received</b>   | <b>: 27-Jun-2022</b>                                            |
| <b>Order number</b>            | <b>: pfas-omp Learmonth</b>                               | <b>Date Analysis Commenced</b> | <b>: 28-Jun-2022</b>                                            |
| <b>C-O-C number</b>            | <b>: 39236</b>                                            | <b>Issue Date</b>              | <b>: 11-Jul-2022</b>                                            |
| <b>Sampler</b>                 | <b>: [REDACTED]</b>                                       |                                |                                                                 |
| <b>Site</b>                    | <b>: Learmonth GW - [REDACTED]</b>                        |                                |                                                                 |
| <b>Quote number</b>            | <b>: SY/139/19 B</b>                                      |                                |                                                                 |
| <b>No. of samples received</b> | <b>: 13</b>                                               |                                |                                                                 |
| <b>No. of samples analysed</b> | <b>: 13</b>                                               |                                |                                                                 |



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>                |
|--------------------|----------------------------|----------------------------------------------|
| Canhuang Ke        | Inorganics Supervisor      | Perth Inorganics, Wangara, Western Australia |
| [REDACTED]         | Laboratory Manager (Perth) | Perth Inorganics, Wangara, Western Australia |
| [REDACTED]         | LCMS Coordinator           | Sydney Organics, Smithfield, NSW             |



## 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**

| Sub-Matrix: WATER                                                 |                   |                                          |             | Laboratory Duplicate (DUP) Report |      |                 |                  |         |                    |
|-------------------------------------------------------------------|-------------------|------------------------------------------|-------------|-----------------------------------|------|-----------------|------------------|---------|--------------------|
| Laboratory sample ID                                              | Sample ID         | Method: Compound                         | CAS Number  | LOR                               | Unit | Original Result | Duplicate Result | RPD (%) | Acceptable RPD (%) |
| ED037P: Alkalinity by PC Titrator (QC Lot: 4447989)               |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207731-002                                                     | Anonymous         | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 198             | 201              | 1.4     | 0% - 20%           |
|                                                                   |                   | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 198             | 201              | 1.4     | 0% - 20%           |
| EP2207731-012                                                     | Anonymous         | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 162             | 162              | 0.0     | 0% - 20%           |
|                                                                   |                   | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 162             | 162              | 0.0     | 0% - 20%           |
| ED037P: Alkalinity by PC Titrator (QC Lot: 4447990)               |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207737-004                                                     | 0960_QC115_220622 | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 930             | 939              | 1.0     | 0% - 20%           |
|                                                                   |                   | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 930             | 939              | 1.0     | 0% - 20%           |
| EP2207812-001                                                     | Anonymous         | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 69              | 68               | 0.0     | 0% - 20%           |
|                                                                   |                   | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 69              | 68               | 0.0     | 0% - 20%           |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4429755) |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207728-001                                                     | Anonymous         | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 30              | 29               | 0.0     | 0% - 20%           |
| EP2207737-006                                                     | 0960_MW115_220622 | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 1550            | 1560             | 0.8     | 0% - 20%           |
| ED045G: Chloride by Discrete Analyser (QC Lot: 4429754)           |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207728-001                                                     | Anonymous         | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 240             | 243              | 1.2     | 0% - 20%           |
| EP2207737-006                                                     | 0960_MW115_220622 | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 11900           | 12000            | 0.6     | 0% - 20%           |



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 Work Order : EP2207737  
 Client : STANTEC AUSTRALIA PTY LTD  
 Project : WA\_0960\_PFASOMP



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 (%) |
| ED093F: Dissolved Major Cations (QC Lot: 4427081)         |                   |                                                                   |            |                                   |      |                 |                  |         |                    |
| EP2207732-003                                             | Anonymous         | ED093F: Calcium                                                   | 7440-70-2  | 1                                 | mg/L | 27              | 28               | 0.0     | 0% - 20%           |
|                                                           |                   | ED093F: Magnesium                                                 | 7439-95-4  | 1                                 | mg/L | 3               | 3                | 0.0     | No Limit           |
|                                                           |                   | ED093F: Sodium                                                    | 7440-23-5  | 1                                 | mg/L | 11              | 10               | 0.0     | 0% - 50%           |
|                                                           |                   | ED093F: Potassium                                                 | 7440-09-7  | 1                                 | mg/L | 5               | 5                | 0.0     | No Limit           |
| EP2207737-010                                             | 0960_MW163_220622 | ED093F: Calcium                                                   | 7440-70-2  | 1                                 | mg/L | 171             | 176              | 2.6     | 0% - 20%           |
|                                                           |                   | ED093F: Magnesium                                                 | 7439-95-4  | 1                                 | mg/L | 205             | 207              | 1.1     | 0% - 20%           |
|                                                           |                   | ED093F: Sodium                                                    | 7440-23-5  | 1                                 | mg/L | 2190            | 2220             | 1.3     | 0% - 20%           |
|                                                           |                   | ED093F: Potassium                                                 | 7440-09-7  | 1                                 | mg/L | 104             | 104              | 0.0     | 0% - 20%           |
| EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4438993)   |                   |                                                                   |            |                                   |      |                 |                  |         |                    |
| EP2207737-010                                             | 0960_MW163_220622 | EP231X: Perfluorohexane sulfonic acid (PFHxS)                     | 355-46-4   | 0.01                              | µg/L | 1.49            | 1.48             | 1.2     | 0% - 20%           |
|                                                           |                   | EP231X: Perfluorooctane sulfonic acid (PFOS)                      | 1763-23-1  | 0.01                              | µg/L | 0.70            | 0.67             | 4.2     | 0% - 20%           |
|                                                           |                   | EP231X: Perfluorobutane sulfonic acid (PFBS)                      | 375-73-5   | 0.02                              | µg/L | 0.14            | 0.13             | 0.0     | No Limit           |
|                                                           |                   | EP231X: Perfluoropentane sulfonic acid (PFPeS)                    | 2706-91-4  | 0.02                              | µg/L | 0.19            | 0.18             | 7.2     | No Limit           |
|                                                           |                   | EP231X: Perfluoroheptane sulfonic acid (PFHpS)                    | 375-92-8   | 0.02                              | µg/L | 0.08            | 0.09             | 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: 4438993) |                   |                                                                   |            |                                   |      |                 |                  |         |                    |
| EP2207737-010                                             | 0960_MW163_220622 | 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 | 0.11            | 0.09             | 18.3    | No Limit           |
|                                                           |                   | EP231X: Perfluorohexanoic acid (PFHxA)                            | 307-24-4   | 0.02                              | µg/L | 0.46            | 0.42             | 9.1     | 0% - 20%           |
|                                                           |                   | EP231X: Perfluoroheptanoic acid (PFHpA)                           | 375-85-9   | 0.02                              | µg/L | 0.05            | 0.04             | 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: 4438993)     |                   |                                                                   |            |                                   |      |                 |                  |         |                    |
| EP2207737-010                                             | 0960_MW163_220622 | 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           |

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 Work Order : EP2207737  
 Client : STANTEC AUSTRALIA PTY LTD  
 Project : WA\_0960\_PFASOMP



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 (%) |
| EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4438993) - continued |                   |                                                             |             |                                   |      |                 |                  |         |                    |
| EP2207737-010                                                     | 0960_MW163_220622 | 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: 4438993)      |                   |                                                             |             |                                   |      |                 |                  |         |                    |
| EP2207737-010                                                     | 0960_MW163_220622 | 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: 4438993)                               |                   |                                                             |             |                                   |      |                 |                  |         |                    |
| EP2207737-010                                                     | 0960_MW163_220622 | EP231X: Sum of PFAS                                         | ----        | 0.01                              | µg/L | 3.28            | 3.16             | 3.7     | 0% - 20%           |



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

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

Sub-Matrix: **WATER**

| Sub-Matrix: WATER                                                |                 |      |      | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |      |
|------------------------------------------------------------------|-----------------|------|------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|------|
|                                                                  |                 |      |      |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |      |
| Method: Compound                                                 | CAS Number      | LOR  | Unit | Result                      |                                       |                           |                                   |      |
| ED037P: Alkalinity by PC Titrator (QCLot: 4447989)               |                 |      |      |                             |                                       |                           |                                   |      |
| ED037-P: Hydroxide Alkalinity as CaCO3                           | DMO-210-00<br>1 | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Carbonate Alkalinity as CaCO3                           | 3812-32-6       | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Bicarbonate Alkalinity as CaCO3                         | 71-52-3         | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Total Alkalinity as CaCO3                               | ----            | 1    | mg/L | <1                          | 20 mg/L                               | 107                       | 87.8                              | 118  |
|                                                                  |                 |      |      | <1                          | 200 mg/L                              | 97.4                      | 87.8                              | 118  |
| ED037P: Alkalinity by PC Titrator (QCLot: 4447990)               |                 |      |      |                             |                                       |                           |                                   |      |
| ED037-P: Hydroxide Alkalinity as CaCO3                           | DMO-210-00<br>1 | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Carbonate Alkalinity as CaCO3                           | 3812-32-6       | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Bicarbonate Alkalinity as CaCO3                         | 71-52-3         | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Total Alkalinity as CaCO3                               | ----            | 1    | mg/L | <1                          | 20 mg/L                               | 107                       | 87.8                              | 118  |
|                                                                  |                 |      |      | <1                          | 200 mg/L                              | 94.9                      | 87.8                              | 118  |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4429755) |                 |      |      |                             |                                       |                           |                                   |      |
| ED041G: Sulfate as SO4 - Turbidimetric                           | 14808-79-8      | 1    | mg/L | <1                          | 25 mg/L                               | 102                       | 89.9                              | 112  |
|                                                                  |                 |      |      | <1                          | 500 mg/L                              | 103                       | 89.9                              | 112  |
| ED045G: Chloride by Discrete Analyser (QCLot: 4429754)           |                 |      |      |                             |                                       |                           |                                   |      |
| ED045G: Chloride                                                 | 16887-00-6      | 1    | mg/L | <1                          | 10 mg/L                               | 108                       | 88.6                              | 113  |
|                                                                  |                 |      |      | <1                          | 1000 mg/L                             | 100                       | 88.6                              | 113  |
| ED093F: Dissolved Major Cations (QCLot: 4427081)                 |                 |      |      |                             |                                       |                           |                                   |      |
| ED093F: Calcium                                                  | 7440-70-2       | 1    | mg/L | <1                          | 50 mg/L                               | 91.4                      | 86.5                              | 117  |
| ED093F: Magnesium                                                | 7439-95-4       | 1    | mg/L | <1                          | 50 mg/L                               | 94.0                      | 88.4                              | 110  |
| ED093F: Sodium                                                   | 7440-23-5       | 1    | mg/L | <1                          | 50 mg/L                               | 106                       | 91.4                              | 113  |
| ED093F: Potassium                                                | 7440-09-7       | 1    | mg/L | <1                          | 50 mg/L                               | 95.1                      | 84.6                              | 108  |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4438993)           |                 |      |      |                             |                                       |                           |                                   |      |
| EP231X: Perfluorobutane sulfonic acid (PFBS)                     | 375-73-5        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 100                       | 72.0                              | 130  |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)                   | 2706-91-4       | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 92.0                      | 71.0                              | 127  |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)                    | 355-46-4        | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 98.0                      | 68.0                              | 131  |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)                   | 375-92-8        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 100                       | 69.0                              | 134  |
| EP231X: Perfluorooctane sulfonic acid (PFOS)                     | 1763-23-1       | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 84.0                      | 65.0                              | 140  |
| EP231X: Perfluorodecane sulfonic acid (PFDS)                     | 335-77-3        | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 88.0                      | 53.0                              | 142  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4438993)         |                 |      |      |                             |                                       |                           |                                   |      |
| EP231X: Perfluorobutanoic acid (PFBA)                            | 375-22-4        | 0.1  | µg/L | <0.1                        | 1.25 µg/L                             | 94.8                      | 73.0                              | 129  |
| EP231X: Perfluoropentanoic acid (PFPeA)                          | 2706-90-3       | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 100                       | 72.0                              | 129  |



Sub-Matrix: **WATER**

| Sub-Matrix: WATER                                                    |             |      |      | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |     |
|----------------------------------------------------------------------|-------------|------|------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|-----|
|                                                                      |             |      |      |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |     |
| Method: Compound                                                     | CAS Number  | LOR  | Unit | Result                      |                                       |                           |                                   |     |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4438993) - continued |             |      |      |                             |                                       |                           |                                   |     |
| 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                             | 104                       | 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                             | 110                       | 69.0                              | 130 |
| EP231X: Perfluorodecanoic acid (PFDA)                                | 335-76-2    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 122                       | 71.0                              | 129 |
| EP231X: Perfluoroundecanoic acid (PFUnDA)                            | 2058-94-8   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 90.0                      | 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 (PFTeDA)                           | 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                            | 87.2                      | 71.0                              | 132 |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4438993)                 |             |      |      |                             |                                       |                           |                                   |     |
| EP231X: Perfluorooctane sulfonamide (FOSA)                           | 754-91-6    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 116                       | 67.0                              | 137 |
| EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)                | 31506-32-8  | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 98.4                      | 68.0                              | 141 |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)                 | 4151-50-2   | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 98.4                      | 62.6                              | 147 |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)         | 24448-09-7  | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 119                       | 66.0                              | 145 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)          | 1691-99-2   | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 79.2                      | 57.6                              | 145 |
| EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)    | 2355-31-9   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 108                       | 65.0                              | 136 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)     | 2991-50-6   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 100                       | 61.0                              | 135 |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4438993)          |             |      |      |                             |                                       |                           |                                   |     |
| EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                    | 757124-72-4 | 0.05 | µg/L | <0.05                       | 0.25 µg/L                             | 100                       | 63.0                              | 143 |
| EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                    | 27619-97-2  | 0.05 | µg/L | <0.05                       | 0.25 µg/L                             | 120                       | 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                             | 104                       | 67.0                              | 138 |
| EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)                  | 120226-60-0 | 0.05 | µg/L | <0.05                       | 0.25 µg/L                             | 98.0                      | 71.4                              | 144 |

## Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

|                                                                         |           |                                        |            | Matrix Spike (MS) Report |                   |                       |      |
|-------------------------------------------------------------------------|-----------|----------------------------------------|------------|--------------------------|-------------------|-----------------------|------|
|                                                                         |           |                                        |            | Spike                    | Spike Recovery(%) | Acceptable Limits (%) |      |
| Laboratory sample ID                                                    | Sample ID | Method: Compound                       | CAS Number | Concentration            | MS                | Low                   | High |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4429755)</b> |           |                                        |            |                          |                   |                       |      |
| EP2207728-001                                                           | Anonymous | ED041G: Sulfate as SO4 - Turbidimetric | 14808-79-8 | 100 mg/L                 | 93.7              | 70.4                  | 130  |
| <b>ED045G: Chloride by Discrete Analyser (QCLot: 4429754)</b>           |           |                                        |            |                          |                   |                       |      |
| EP2207728-001                                                           | Anonymous | ED045G: Chloride                       | 16887-00-6 | 1000 mg/L                | 93.8              | 70.0                  | 130  |

Page : 7 of 7  
Work Order : EP2207737  
Client : STANTEC AUSTRALIA PTY LTD  
Project : WA\_0960\_PFASOMP

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## QA/QC Compliance Assessment to assist with Quality Review

|              |                             |                         |                                |
|--------------|-----------------------------|-------------------------|--------------------------------|
| Work Order   | : EP2207737                 | Page                    | : 1 of 6                       |
| Client       | : STANTEC AUSTRALIA PTY LTD | Laboratory              | : Environmental Division Perth |
| Contact      | : [REDACTED]                | Telephone               | : +6138549 9609                |
| Project      | : WA_0960_PFASOMP           | Date Samples Received   | : 27-Jun-2022                  |
| Site         | : Learmonth GW - [REDACTED] | Issue Date              | : 11-Jul-2022                  |
| Sampler      | : [REDACTED]                | No. of samples received | : 13                           |
| Order number | : pfas-omp Learmonth        | No. of samples analysed | : 13                           |

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

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

### Summary of Outliers

#### Outliers : Quality Control Samples

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

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

#### Outliers : Analysis Holding Time Compliance

- 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.

Matrix: **WATER**

### Outliers : Frequency of Quality Control Samples

Matrix: WATER

### ***Analysis Holding Time Compliance***

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

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

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

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

Matrix: WATER

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                   | Sample Date              | Extraction / Preparation |                    |            | Analysis      |                  |             |   |
|------------------------------------------|--------------------------|--------------------------|--------------------|------------|---------------|------------------|-------------|---|
| Container / Client Sample ID(s)          |                          | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation  |   |
| ED037P: Alkalinity by PC Titrator        |                          |                          |                    |            |               |                  |             |   |
| Clear Plastic Bottle - Natural (ED037-P) |                          |                          |                    |            |               |                  |             |   |
| 0960_MW168_220622,                       | 0960_MW167_220622,       | 22-Jun-2022              | ----               | ----       | ----          | 08-Jul-2022      | 06-Jul-2022 | ✖ |
| 0960_MW166_220622,                       | 0960_QC115_220622,       |                          |                    |            |               |                  |             |   |
| 0960_MW112_220622,                       | 0960_MW115_220622,       |                          |                    |            |               |                  |             |   |
| 0960_MW165_220622,                       | 0960_MW164_220622,       |                          |                    |            |               |                  |             |   |
| 0960_QC120_220622,                       | 0960_MW163_220622,       |                          |                    |            |               |                  |             |   |
| 0960_MW211_220622,                       | 0960_MW179_1-1.5_220622, |                          |                    |            |               |                  |             |   |
| 0960_MW137_0.8-1.3_220622                |                          |                          |                    |            |               |                  |             |   |





Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                                                                                                                                                                 | Sample Date                                                                                                             | Extraction / Preparation |                    |             | Analysis      |                  |             |   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------|-------------|---------------|------------------|-------------|---|
| Container / Client Sample ID(s)                                                                                                                                                        |                                                                                                                         | Date extracted           | Due for extraction | Evaluation  | Date analysed | Due for analysis | Evaluation  |   |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA                                                                                                                                        |                                                                                                                         |                          |                    |             |               |                  |             |   |
| Clear Plastic Bottle - Natural (ED041G)<br>0960_MW168_220622, 0960_MW166_220622, 0960_MW112_220622, 0960_MW165_220622, 0960_QC120_220622, 0960_MW211_220622, 0960_MW137_0.8-1.3_220622 | 0960_MW167_220622, 0960_QC115_220622, 0960_MW115_220622, 0960_MW164_220622, 0960_MW163_220622, 0960_MW179_1-1.5_220622, | 22-Jun-2022              | ----               | ----        | ----          | 08-Jul-2022      | 20-Jul-2022 | ✓ |
| ED045G: Chloride by Discrete Analyser                                                                                                                                                  |                                                                                                                         |                          |                    |             |               |                  |             |   |
| Clear Plastic Bottle - Natural (ED045G)<br>0960_MW168_220622, 0960_MW166_220622, 0960_MW112_220622, 0960_MW165_220622, 0960_QC120_220622, 0960_MW211_220622, 0960_MW137_0.8-1.3_220622 | 0960_MW167_220622, 0960_QC115_220622, 0960_MW115_220622, 0960_MW164_220622, 0960_MW163_220622, 0960_MW179_1-1.5_220622, | 22-Jun-2022              | ----               | ----        | ----          | 08-Jul-2022      | 20-Jul-2022 | ✓ |
| ED093F: Dissolved Major Cations                                                                                                                                                        |                                                                                                                         |                          |                    |             |               |                  |             |   |
| Clear Plastic Bottle - Natural (ED093F)<br>0960_MW168_220622, 0960_MW166_220622, 0960_MW112_220622, 0960_MW165_220622, 0960_QC120_220622, 0960_MW211_220622, 0960_MW137_0.8-1.3_220622 | 0960_MW167_220622, 0960_QC115_220622, 0960_MW115_220622, 0960_MW164_220622, 0960_MW163_220622, 0960_MW179_1-1.5_220622, | 22-Jun-2022              | ----               | ----        | ----          | 28-Jun-2022      | 29-Jun-2022 | ✓ |
| EP231A: Perfluoroalkyl Sulfonic Acids                                                                                                                                                  |                                                                                                                         |                          |                    |             |               |                  |             |   |
| HDPE (no PTFE) (EP231X)<br>0960_MW168_220622, 0960_MW166_220622, 0960_MW112_220622, 0960_MW165_220622, 0960_QC120_220622, 0960_MW211_220622, 0960_MW137_0.8-1.3_220622                 | 0960_MW167_220622, 0960_QC115_220622, 0960_MW115_220622, 0960_MW164_220622, 0960_MW163_220622, 0960_MW179_1-1.5_220622, | 22-Jun-2022              | 05-Jul-2022        | 19-Dec-2022 | ✓             | 06-Jul-2022      | 19-Dec-2022 | ✓ |



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                     |                          | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |
|--------------------------------------------|--------------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|
| Container / Client Sample ID(s)            |                          |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| EP231B: Perfluoroalkyl Carboxylic Acids    |                          |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                    |                          | 22-Jun-2022 | 05-Jul-2022              | 19-Dec-2022        | ✔          | 06-Jul-2022   | 19-Dec-2022      | ✔          |
| 0960_MW168_220622,                         | 0960_MW167_220622,       |             |                          |                    |            |               |                  |            |
| 0960_MW166_220622,                         | 0960_QC115_220622,       |             |                          |                    |            |               |                  |            |
| 0960_MW112_220622,                         | 0960_MW115_220622,       |             |                          |                    |            |               |                  |            |
| 0960_MW165_220622,                         | 0960_MW164_220622,       |             |                          |                    |            |               |                  |            |
| 0960_QC120_220622,                         | 0960_MW163_220622,       |             |                          |                    |            |               |                  |            |
| 0960_MW211_220622,                         | 0960_MW179_1-1.5_220622, |             |                          |                    |            |               |                  |            |
| 0960_MW137_0.8-1.3_220622                  |                          |             |                          |                    |            |               |                  |            |
| EP231C: Perfluoroalkyl Sulfonamides        |                          |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                    |                          | 22-Jun-2022 | 05-Jul-2022              | 19-Dec-2022        | ✔          | 06-Jul-2022   | 19-Dec-2022      | ✔          |
| 0960_MW168_220622,                         | 0960_MW167_220622,       |             |                          |                    |            |               |                  |            |
| 0960_MW166_220622,                         | 0960_QC115_220622,       |             |                          |                    |            |               |                  |            |
| 0960_MW112_220622,                         | 0960_MW115_220622,       |             |                          |                    |            |               |                  |            |
| 0960_MW165_220622,                         | 0960_MW164_220622,       |             |                          |                    |            |               |                  |            |
| 0960_QC120_220622,                         | 0960_MW163_220622,       |             |                          |                    |            |               |                  |            |
| 0960_MW211_220622,                         | 0960_MW179_1-1.5_220622, |             |                          |                    |            |               |                  |            |
| 0960_MW137_0.8-1.3_220622                  |                          |             |                          |                    |            |               |                  |            |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids |                          |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                    |                          | 22-Jun-2022 | 05-Jul-2022              | 19-Dec-2022        | ✔          | 06-Jul-2022   | 19-Dec-2022      | ✔          |
| 0960_MW168_220622,                         | 0960_MW167_220622,       |             |                          |                    |            |               |                  |            |
| 0960_MW166_220622,                         | 0960_QC115_220622,       |             |                          |                    |            |               |                  |            |
| 0960_MW112_220622,                         | 0960_MW115_220622,       |             |                          |                    |            |               |                  |            |
| 0960_MW165_220622,                         | 0960_MW164_220622,       |             |                          |                    |            |               |                  |            |
| 0960_QC120_220622,                         | 0960_MW163_220622,       |             |                          |                    |            |               |                  |            |
| 0960_MW211_220622,                         | 0960_MW179_1-1.5_220622, |             |                          |                    |            |               |                  |            |
| 0960_MW137_0.8-1.3_220622                  |                          |             |                          |                    |            |               |                  |            |
| EP231P: PFAS Sums                          |                          |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                    |                          | 22-Jun-2022 | 05-Jul-2022              | 19-Dec-2022        | ✔          | 06-Jul-2022   | 19-Dec-2022      | ✔          |
| 0960_MW168_220622,                         | 0960_MW167_220622,       |             |                          |                    |            |               |                  |            |
| 0960_MW166_220622,                         | 0960_QC115_220622,       |             |                          |                    |            |               |                  |            |
| 0960_MW112_220622,                         | 0960_MW115_220622,       |             |                          |                    |            |               |                  |            |
| 0960_MW165_220622,                         | 0960_MW164_220622,       |             |                          |                    |            |               |                  |            |
| 0960_QC120_220622,                         | 0960_MW163_220622,       |             |                          |                    |            |               |                  |            |
| 0960_MW211_220622,                         | 0960_MW179_1-1.5_220622, |             |                          |                    |            |               |                  |            |
| 0960_MW137_0.8-1.3_220622                  |                          |             |                          |                    |            |               |                  |            |



## Quality Control Parameter Frequency Compliance

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

Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

| Quality Control Sample Type                            |         | Count |         | Rate (%) |          |            | Quality Control Specification  |
|--------------------------------------------------------|---------|-------|---------|----------|----------|------------|--------------------------------|
| Analytical Methods                                     | Method  | QC    | Regular | Actual   | Expected | Evaluation |                                |
| Laboratory Duplicates (DUP)                            |         |       |         |          |          |            |                                |
| Alkalinity by Auto Titrator                            | ED037-P | 4     | 40      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 2     | 19      | 10.53    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 20      | 5.00     | 10.00    | ✗          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Laboratory Control Samples (LCS)                       |         |       |         |          |          |            |                                |
| Alkalinity by Auto Titrator                            | ED037-P | 4     | 40      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 1     | 19      | 5.26     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Method Blanks (MB)                                     |         |       |         |          |          |            |                                |
| Alkalinity by Auto Titrator                            | ED037-P | 2     | 40      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 1     | 19      | 5.26     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Matrix Spikes (MS)                                     |         |       |         |          |          |            |                                |
| Chloride by Discrete Analyser                          | ED045G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 0     | 20      | 0.00     | 5.00     | ✗          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |



## Brief Method Summaries

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

| Analytical Methods                                                 | Method       | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------------------|--------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alkalinity by Auto Titrator                                        | ED037-P      | WATER  | In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                                                                                                                                                                                                                |
| Sulfate (Turbidimetric) as SO <sub>4</sub> 2- by Discrete Analyser | ED041G       | WATER  | In house: Referenced to APHA 4500-SO <sub>4</sub> . Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO <sub>4</sub> suspension is measured by a photometer and the SO <sub>4</sub> -2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                         |
| Chloride by Discrete Analyser                                      | ED045G       | WATER  | In house: Referenced to APHA 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm.                                                                                                                                                                                                                                                                                                                                                                |
| Major Cations - Dissolved                                          | ED093F       | WATER  | In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                           |
| Ionic Balance by PCT DA and Turbi SO <sub>4</sub> DA               | * EN055 - PG | WATER  | In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS               | EP231X       | WATER  | In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements. |
| Preparation Methods                                                | Method       | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Solid Phase Extraction (SPE) for PFAS in water                     | ORG72        | WATER  | In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.                                                                                                                                                                                                |



# CHAIN OF CUSTODY

COC#: 39237

ALS Laboratory: EP Perth

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: Learmonth SD - AG

ORDER NO: pfas-omp Learmonth

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:

## SAMPLE DETAILS

## ANALYSIS REQUIRED

| SAMPLE | NAME       | DESCRIPTION | DATE / TIME         | MATRIX | TOTAL BOTTLES        | ON HOLD | PFAS Sediments SEDIMENT | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|------------|-------------|---------------------|--------|----------------------|---------|-------------------------|----------------------|------------------------|
| 001    | 0960_SS122 |             | 22/06/2022 08:44 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |
| 002    | 0960_SS121 |             | 22/06/2022 09:02 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |
| 003    | 0960_SD209 |             | 22/06/2022 12:28 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |
| 004    | 0960_SD302 |             | 22/06/2022 12:41 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |
| 005    | 0960_SD210 |             | 22/06/2022 01:10 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |



# CHAIN OF CUSTODY

COC#: 39237

ALS Laboratory: EP Perth

CLIENT: MWH AUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: Learmonth SD - AG

ORDER NO: pfas-omp Learmonth

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:

| SAMPLE | SAMPLE NAME | BOTTLE NAME   | VOLUME | BARCODE        | TYPE | FILTERED | REASON |
|--------|-------------|---------------|--------|----------------|------|----------|--------|
| 001    | 0960_SS122  | HDPE Soil Jar | 200 mL | 00620322029550 | Grey | No       |        |
| 002    | 0960_SS121  | HDPE Soil Jar | 200 mL | 00620322036411 | Grey | No       |        |
| 003    | 0960_SD209  | HDPE Soil Jar | 200 mL | 00620322036405 | Grey | No       |        |
| 004    | 0960_SD302  | HDPE Soil Jar | 200 mL | 00620322036446 | Grey | No       |        |
| 005    | 0960_SD210  | HDPE Soil Jar | 200 mL | 00620322029664 | Grey | No       |        |

Total Bottle Count: ALS: 5, Non ALS: 0

**SAMPLE RECEIPT NOTIFICATION (SRN)****Work Order : EP2207738**

|              |                                                   |              |                                                             |
|--------------|---------------------------------------------------|--------------|-------------------------------------------------------------|
| Client       | : STANTEC AUSTRALIA PTY LTD                       | Laboratory   | : Environmental Division Perth                              |
| Contact      | : [REDACTED]                                      | Contact      | : [REDACTED]                                                |
| Address      | : GROUND FLOOR 226 ADELAIDE TERRACE<br>PERTH 6000 | Address      | : 26 Rigali Way Wangara Western<br>Australia Australia 6065 |
| E-mail       | : [REDACTED]@stantec.com                          | E-mail       | : [REDACTED]@alsglobal.com                                  |
| Telephone    | : ----                                            | Telephone    | : +6138549 9609                                             |
| Facsimile    | : ----                                            | Facsimile    | : +61-8-9406 1399                                           |
| Project      | : WA_0960_PFASOMP                                 | Page         | : 1 of 2                                                    |
| Order number | : pfas-omp Learmonth                              | Quote number | : ES2022MWHAUS0002 (SY/139/19 B)                            |
| C-O-C number | : 39237                                           | QC Level     | : NEPM 2013 B3 & ALS QC Standard                            |
| Site         | : Learmonth SD - [REDACTED]                       |              |                                                             |
| Sampler      | : [REDACTED]                                      |              |                                                             |

**Dates**

|                           |                     |                          |                      |
|---------------------------|---------------------|--------------------------|----------------------|
| Date Samples Received     | : 27-Jun-2022 11:40 | Issue Date               | : 28-Jun-2022        |
| Client Requested Due Date | : 08-Jul-2022       | Scheduled Reporting Date | : <b>08-Jul-2022</b> |

**Delivery Details**

|                      |           |                                    |                      |
|----------------------|-----------|------------------------------------|----------------------|
| Mode of Delivery     | : Carrier | Security Seal                      | : Not Available      |
| No. of coolers/boxes | : 5       | Temperature                        | : 13.4 - Ice present |
| Receipt Detail       | :         | No. of samples received / analysed | : 5 / 5              |

**General Comments**

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





## Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exists.

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: SOIL

| Laboratory sample ID | Sampling date / time | Sample ID         | SOIL - EA055-103 Moisture Content | SOIL - EP231X (solids) PFAS - Full Suite (28 analytes) |
|----------------------|----------------------|-------------------|-----------------------------------|--------------------------------------------------------|
| EP2207738-001        | 22-Jun-2022 08:44    | 0960_SS122_220622 | ✓                                 | ✓                                                      |
| EP2207738-002        | 22-Jun-2022 09:02    | 0960_SS121_220622 | ✓                                 | ✓                                                      |
| EP2207738-003        | 22-Jun-2022 12:28    | 0960_SD209_220622 | ✓                                 | ✓                                                      |
| EP2207738-004        | 22-Jun-2022 12:41    | 0960_SD302_220622 | ✓                                 | ✓                                                      |
| EP2207738-005        | 22-Jun-2022 13:10    | 0960_SD210_220622 | ✓                                 | ✓                                                      |

## Proactive Holding Time Report

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

## Requested Deliverables

|                                                                                                                  |       |                              |
|------------------------------------------------------------------------------------------------------------------|-------|------------------------------|
| <ul style="list-style-type: none"> <li>- A4 - AU Tax Invoice (INV)</li> </ul>                                    | Email | cardno.com.au                |
| <b>DERP LAB REPORTS</b> <ul style="list-style-type: none"> <li>- EDI Format - ESDAT (ESDAT)</li> </ul>           | Email | derp.labreports@esdat.com.au |
| <ul style="list-style-type: none"> <li>- *AU Certificate of Analysis - NATA (COA)</li> </ul>                     | Email | stantec.com                  |
| <ul style="list-style-type: none"> <li>- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)</li> </ul>    | Email | stantec.com                  |
| <ul style="list-style-type: none"> <li>- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)</li> </ul>            | Email | stantec.com                  |
| <ul style="list-style-type: none"> <li>- A4 - AU Sample Receipt Notification - Environmental HT (SRN)</li> </ul> | Email | stantec.com                  |
| <ul style="list-style-type: none"> <li>- Chain of Custody (CoC) (COC)</li> </ul>                                 | Email | stantec.com                  |
| <ul style="list-style-type: none"> <li>- EDI Format - ESDAT (ESDAT)</li> </ul>                                   | Email | stantec.com                  |
| <ul style="list-style-type: none"> <li>- EDI Format - XTab (XTAB)</li> </ul>                                     | Email | stantec.com                  |

## CERTIFICATE OF ANALYSIS

**Work Order** : **EP2207738**  
**Client** : **STANTEC AUSTRALIA PTY LTD**  
**Contact** : [REDACTED]  
**Address** : **GROUND FLOOR 226 ADELAIDE TERRACE**  
**PERTH 6000**  
**Telephone** : **----**  
**Project** : **WA\_0960\_PFASOMP**  
**Order number** : **pfas-omp Learmonth**  
**C-O-C number** : **39237**  
**Sampler** : [REDACTED]  
**Site** : **Learmonth SD - [REDACTED]**  
**Quote number** : **SY/139/19 B**  
**No. of samples received** : **5**  
**No. of samples analysed** : **5**

**Page** : 1 of 5  
**Laboratory** : Environmental Division Perth  
**Contact** : [REDACTED]  
**Address** : **26 Rigali Way Wangara Western Australia Australia 6065**  
**Telephone** : **+6138549 9609**  
**Date Samples Received** : **27-Jun-2022 11:40**  
**Date Analysis Commenced** : **04-Jul-2022**  
**Issue Date** : **08-Jul-2022 11:20**



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             |
|------------------------------------------------------------------------|------------------|------------------------------------|
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator | Sydney Inorganics, Smithfield, NSW |
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator | Sydney Organics, Smithfield, NSW   |



## 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.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- 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

|                                                    |            |        |       | 0960_SS122_220622 | 0960_SS121_220622 | 0960_SD209_220622 | 0960_SD302_220622 | 0960_SD210_220622 |
|----------------------------------------------------|------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                               |            |        |       | 22-Jun-2022 08:44 | 22-Jun-2022 09:02 | 22-Jun-2022 12:28 | 22-Jun-2022 12:41 | 22-Jun-2022 13:10 |
| Compound                                           | CAS Number | LOR    | Unit  | EP2207738-001     | EP2207738-002     | EP2207738-003     | EP2207738-004     | EP2207738-005     |
|                                                    |            |        |       | Result            | Result            | Result            | Result            | Result            |
| <b>EA055: Moisture Content (Dried @ 105-110°C)</b> |            |        |       |                   |                   |                   |                   |                   |
| Moisture Content                                   | ----       | 0.1    | %     | 8.7               | 29.0              | 35.3              | 38.6              | 44.4              |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>       |            |        |       |                   |                   |                   |                   |                   |
| Perfluorobutane sulfonic acid (PFBS)               | 375-73-5   | 0.0002 | mg/kg | 0.0003            | <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 | 0.0006            | <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 | 0.0016            | 0.0110            | <0.0002           | <0.0002           | 0.0011            |
| Perfluorodecane sulfonic acid (PFDS)               | 335-77-3   | 0.0002 | mg/kg | <0.0002           | <0.0002           | <0.0002           | <0.0002           | <0.0002           |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>     |            |        |       |                   |                   |                   |                   |                   |
| 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 | 0.0004            | <0.0002           | <0.0002           | <0.0002           | <0.0002           |
| Perfluorohexanoic acid (PFHxA)                     | 307-24-4   | 0.0002 | mg/kg | 0.0021            | <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           | 0.0005            | <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 | <0.0002           | <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 (PFTTrDA)                | 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           |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>         |            |        |       |                   |                   |                   |                   |                   |
| 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

|                                                           |                    |        |       | 0960_SS122_220622 | 0960_SS121_220622 | 0960_SD209_220622 | 0960_SD302_220622 | 0960_SD210_220622 |
|-----------------------------------------------------------|--------------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                      |                    |        |       | 22-Jun-2022 08:44 | 22-Jun-2022 09:02 | 22-Jun-2022 12:28 | 22-Jun-2022 12:41 | 22-Jun-2022 13:10 |
| Compound                                                  | CAS Number         | LOR    | Unit  | EP2207738-001     | EP2207738-002     | EP2207738-003     | EP2207738-004     | EP2207738-005     |
|                                                           |                    |        |       | Result            | Result            | Result            | Result            | Result            |
| <b>EP231C: Perfluoroalkyl Sulfonamides - Continued</b>    |                    |        |       |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>         |                    |        |       |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231P: PFAS Sums</b>                                  |                    |        |       |                   |                   |                   |                   |                   |
| Sum of PFAS                                               | ----               | 0.0002 | mg/kg | 0.0049            | 0.0119            | <0.0002           | <0.0002           | 0.0011            |
| Sum of PFHxS and PFOS                                     | 355-46-4/1763-23-1 | 0.0002 | mg/kg | 0.0021            | 0.0110            | <0.0002           | <0.0002           | 0.0011            |
| Sum of PFAS (WA DER List)                                 | ----               | 0.0002 | mg/kg | 0.0049            | 0.0110            | <0.0002           | <0.0002           | 0.0011            |
| <b>EP231S: PFAS Surrogate</b>                             |                    |        |       |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                 | ----               | 0.0002 | %     | 89.0              | 90.5              | 88.0              | 83.5              | 94.5              |
| 13C8-PFOA                                                 | ----               | 0.0002 | %     | 100               | 107               | 110               | 108               | 112               |

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Work Order : EP2207738  
Client : STANTEC AUSTRALIA PTY LTD  
Project : WA\_0960\_PFASOMP



### Surrogate Control Limits

| Sub-Matrix: <b>SEDIMENT</b>   |            | Recovery Limits (%) |      |
|-------------------------------|------------|---------------------|------|
| Compound                      | CAS Number | Low                 | High |
| <b>EP231S: PFAS Surrogate</b> |            |                     |      |
| <b>13C4-PFOS</b>              | ----       | 60                  | 120  |
| <b>13C8-PFOA</b>              | ----       | 60                  | 120  |

### Inter-Laboratory Testing

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

## QUALITY CONTROL REPORT

|                         |                                                   |                         |                                                          |
|-------------------------|---------------------------------------------------|-------------------------|----------------------------------------------------------|
| Work Order              | : EP2207738                                       | Page                    | : 1 of 7                                                 |
| Client                  | : STANTEC AUSTRALIA PTY LTD                       | Laboratory              | : Environmental Division Perth                           |
| Contact                 | : [REDACTED]                                      | Contact                 | : [REDACTED]                                             |
| Address                 | : GROUND FLOOR 226 ADELAIDE TERRACE<br>PERTH 6000 | Address                 | : 26 Rigali Way Wangara Western Australia Australia 6065 |
| Telephone               | : ----                                            | Telephone               | : +6138549 9609                                          |
| Project                 | : WA_0960_PFASOMP                                 | Date Samples Received   | : 27-Jun-2022                                            |
| Order number            | : pfas-omp Learmonth                              | Date Analysis Commenced | : 04-Jul-2022                                            |
| C-O-C number            | : 39237                                           | Issue Date              | : 08-Jul-2022                                            |
| Sampler                 | : [REDACTED]                                      |                         |                                                          |
| Site                    | : Learmonth SD - [REDACTED]                       |                         |                                                          |
| Quote number            | : SY/139/19 B                                     |                         |                                                          |
| No. of samples received | : 5                                               |                         |                                                          |
| No. of samples analysed | : 5                                               |                         |                                                          |



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]  | LCMS Coordinator | Sydney Inorganics, Smithfield, NSW |
| [REDACTED]  | LCMS Coordinator | Sydney Organics, Smithfield, NSW   |





## 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: <b>SOIL</b>                                       |                   |                                                |            | 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: 4437285) |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2207733-002                                                 | Anonymous         | EA055: Moisture Content                        | ----       | 0.1                               | %     | 13.3            | 13.0             | 2.2     | 0% - 20%           |
| EP2207738-002                                                 | 0960_SS121_220622 | EA055: Moisture Content                        | ----       | 0.1                               | %     | 29.0            | 29.5             | 1.9     | 0% - 20%           |
| EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4443051)       |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2207738-001                                                 | 0960_SS122_220622 | EP231X: Perfluorobutane sulfonic acid (PFBS)   | 375-73-5   | 0.0002                            | mg/kg | 0.0003          | 0.0003           | 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           | 0.0     | 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 | ----            | 0.0020           | 24.2    | No Limit           |
|                                                               |                   | EP231X: Perfluorodecane sulfonic acid (PFDS)   | 335-77-3   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
| EP2207813-006                                                 | 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: 4443051)     |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2207738-001                                                 | 0960_SS122_220622 | 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 | 0.0021          | 0.0024           | 10.9    | 0% - 50%           |
|                                                               |                   | 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: 4443051) - continued |                   |                                                                   |            |                                   |       |                 |                  |         |                    |
| EP2207738-001                                                         | 0960_SS122_220622 | 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           |
| EP2207813-006                                                         | 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: 4443051)                 |                   |                                                                   |            |                                   |       |                 |                  |         |                    |
| EP2207738-001                                                         | 0960_SS122_220622 | 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           |
| EP2207813-006                                                         | 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           |

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 Work Order : EP2207738  
 Client : STANTEC AUSTRALIA PTY LTD  
 Project : WA\_0960\_PFASOMP



| Sub-Matrix: <b>SOIL</b>                                             |                   |                                                     |             | Laboratory Duplicate (DUP) Report |       |                 |                  |         |                    |
|---------------------------------------------------------------------|-------------------|-----------------------------------------------------|-------------|-----------------------------------|-------|-----------------|------------------|---------|--------------------|
| Laboratory sample ID                                                | Sample ID         | Method: Compound                                    | CAS Number  | LOR                               | Unit  | Original Result | Duplicate Result | RPD (%) | Acceptable RPD (%) |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4443051)</b> |                   |                                                     |             |                                   |       |                 |                  |         |                    |
| EP2207738-001                                                       | 0960_SS122_220622 | 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           |
| EP2207813-006                                                       | 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           |



## 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**

| Sub-Matrix: SOIL                                                  |             |        |       | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |     |
|-------------------------------------------------------------------|-------------|--------|-------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|-----|
|                                                                   |             |        |       |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |     |
| Method: Compound                                                  | CAS Number  | LOR    | Unit  | Result                      |                                       |                           |                                   |     |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4443051)            |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: Perfluorobutane sulfonic acid (PFBS)                      | 375-73-5    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 96.0                      | 72.0                              | 128 |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)                    | 2706-91-4   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 105                       | 73.0                              | 123 |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)                     | 355-46-4    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 100                       | 67.0                              | 130 |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)                    | 375-92-8    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 104                       | 70.0                              | 132 |
| EP231X: Perfluorooctane sulfonic acid (PFOS)                      | 1763-23-1   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 106                       | 68.0                              | 136 |
| EP231X: Perfluorodecane sulfonic acid (PFDS)                      | 335-77-3    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 117                       | 59.0                              | 134 |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4443051)          |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: Perfluorobutanoic acid (PFBA)                             | 375-22-4    | 0.001  | mg/kg | <0.001                      | 0.00625 mg/kg                         | 90.2                      | 71.0                              | 135 |
| EP231X: Perfluoropentanoic acid (PFPeA)                           | 2706-90-3   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 104                       | 69.0                              | 132 |
| EP231X: Perfluorohexanoic acid (PFHxA)                            | 307-24-4    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 106                       | 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                         | 111                       | 69.0                              | 133 |
| EP231X: Perfluorononanoic acid (PFNA)                             | 375-95-1    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 112                       | 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                         | 104                       | 64.0                              | 136 |
| EP231X: Perfluorododecanoic acid (PFDoDA)                         | 307-55-1    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 108                       | 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                         | 97.8                      | 69.0                              | 133 |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4443051)              |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 119                       | 67.0                              | 137 |
| EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 109                       | 71.6                              | 129 |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 96.6                      | 69.8                              | 131 |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 117                       | 68.7                              | 130 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 99.4                      | 65.1                              | 134 |
| 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                         | 105                       | 61.0                              | 139 |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4443051)       |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.0005 | mg/kg | <0.0005                     | 0.00125 mg/kg                         | 104                       | 62.0                              | 145 |
| EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 27619-97-2  | 0.0005 | mg/kg | <0.0005                     | 0.00125 mg/kg                         | 108                       | 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                         | 106                       | 65.0                              | 137 |



Sub-Matrix: **SOIL**

| Sub-Matrix: SOIL                                                        |             |        |       | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |     |
|-------------------------------------------------------------------------|-------------|--------|-------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|-----|
|                                                                         |             |        |       |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |     |
| Method: Compound                                                        | CAS Number  | LOR    | Unit  | Result                      |                                       |                           |                                   |     |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4443051) - continued |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)                     | 120226-60-0 | 0.0005 | mg/kg | <0.0005                     | 0.00125 mg/kg                         | 106                       | 69.2                              | 143 |

## 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**

| Sub-Matrix: SOIL                                         |                   |                                                                   |            | Matrix Spike (MS) Report |                  |                       |      |
|----------------------------------------------------------|-------------------|-------------------------------------------------------------------|------------|--------------------------|------------------|-----------------------|------|
|                                                          |                   |                                                                   |            | Spike                    | SpikeRecovery(%) | Acceptable Limits (%) |      |
|                                                          |                   |                                                                   |            | Concentration            | MS               | Low                   | High |
| Laboratory sample ID                                     | Sample ID         | Method: Compound                                                  | CAS Number |                          |                  |                       |      |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4443051)   |                   |                                                                   |            |                          |                  |                       |      |
| EP2207738-001                                            | 0960_SS122_220622 | EP231X: Perfluorobutane sulfonic acid (PFBS)                      | 375-73-5   | 0.00125 mg/kg            | 103              | 72.0                  | 128  |
|                                                          |                   | EP231X: Perfluoropentane sulfonic acid (PFPeS)                    | 2706-91-4  | 0.00125 mg/kg            | 104              | 73.0                  | 123  |
|                                                          |                   | EP231X: Perfluorohexane sulfonic acid (PFHxS)                     | 355-46-4   | 0.00125 mg/kg            | 107              | 67.0                  | 130  |
|                                                          |                   | EP231X: Perfluoroheptane sulfonic acid (PFHpS)                    | 375-92-8   | 0.00125 mg/kg            | 106              | 70.0                  | 132  |
|                                                          |                   | EP231X: Perfluorooctane sulfonic acid (PFOS)                      | 1763-23-1  | 0.00125 mg/kg            | 102              | 68.0                  | 136  |
|                                                          |                   | EP231X: Perfluorodecane sulfonic acid (PFDS)                      | 335-77-3   | 0.00125 mg/kg            | 97.2             | 59.0                  | 134  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4443051) |                   |                                                                   |            |                          |                  |                       |      |
| EP2207738-001                                            | 0960_SS122_220622 | 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            | 108              | 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            | 97.2             | 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            | 116              | 72.0                  | 129  |
|                                                          |                   | EP231X: Perfluorodecanoic acid (PFDA)                             | 335-76-2   | 0.00125 mg/kg            | 108              | 69.0                  | 133  |
|                                                          |                   | EP231X: Perfluoroundecanoic acid (PFUnDA)                         | 2058-94-8  | 0.00125 mg/kg            | 97.2             | 64.0                  | 136  |
|                                                          |                   | EP231X: Perfluorododecanoic acid (PFDoDA)                         | 307-55-1   | 0.00125 mg/kg            | 117              | 69.0                  | 135  |
|                                                          |                   | EP231X: Perfluorotridecanoic acid (PFTTrDA)                       | 72629-94-8 | 0.00125 mg/kg            | 102              | 66.0                  | 139  |
|                                                          |                   | EP231X: Perfluorotetradecanoic acid (PFTeDA)                      | 376-06-7   | 0.00312 mg/kg            | 95.7             | 69.0                  | 133  |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4443051)     |                   |                                                                   |            |                          |                  |                       |      |
| EP2207738-001                                            | 0960_SS122_220622 | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6   | 0.00125 mg/kg            | 121              | 67.0                  | 137  |
|                                                          |                   | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8 | 0.00312 mg/kg            | 110              | 71.6                  | 129  |
|                                                          |                   | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2  | 0.00312 mg/kg            | 109              | 69.8                  | 131  |
|                                                          |                   | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7 | 0.00312 mg/kg            | 120              | 68.7                  | 130  |
|                                                          |                   | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2  | 0.00312 mg/kg            | 101              | 65.1                  | 134  |
|                                                          |                   | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9  | 0.00125 mg/kg            | 111              | 63.0                  | 144  |



Sub-Matrix: SOIL

| Laboratory sample ID      Sample ID      Method: Compound      CAS Number |                   |                                                                  |             | Matrix Spike (MS) Report |                  |                       |      |
|---------------------------------------------------------------------------|-------------------|------------------------------------------------------------------|-------------|--------------------------|------------------|-----------------------|------|
|                                                                           |                   |                                                                  |             | Spike                    | SpikeRecovery(%) | Acceptable Limits (%) |      |
|                                                                           |                   |                                                                  |             | Concentration            | MS               | Low                   | High |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4443051) - continued          |                   |                                                                  |             |                          |                  |                       |      |
| EP2207738-001                                                             | 0960_SS122_220622 | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA) | 2991-50-6   | 0.00125 mg/kg            | 101              | 61.0                  | 139  |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4443051)               |                   |                                                                  |             |                          |                  |                       |      |
| EP2207738-001                                                             | 0960_SS122_220622 | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                | 757124-72-4 | 0.00125 mg/kg            | 97.2             | 62.0                  | 145  |
|                                                                           |                   | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                | 27619-97-2  | 0.00125 mg/kg            | 113              | 64.0                  | 140  |
|                                                                           |                   | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                | 39108-34-4  | 0.00125 mg/kg            | 113              | 65.0                  | 137  |
|                                                                           |                   | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)              | 120226-60-0 | 0.00125 mg/kg            | 98.4             | 69.2                  | 143  |

## QA/QC Compliance Assessment to assist with Quality Review

Work Order : EP2207738

Page : 1 of 4

Client : STANTEC AUSTRALIA PTY LTD  
Contact :   
Project : WA\_0960\_PFASOMP  
Site : Learmonth SD -   
Sampler :   
Order number : pfas-omp Learmonth

Laboratory : Environmental Division Perth  
Telephone : +6138549 9609  
Date Samples Received : 27-Jun-2022  
Issue Date : 08-Jul-2022  
No. of samples received : 5  
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

- **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                                                                                  | Sample Date                              | Extraction / Preparation |                    |             | Analysis      |                  |             |   |
|-----------------------------------------------------------------------------------------|------------------------------------------|--------------------------|--------------------|-------------|---------------|------------------|-------------|---|
| Container / Client Sample ID(s)                                                         |                                          | Date extracted           | Due for extraction | Evaluation  | Date analysed | Due for analysis | Evaluation  |   |
| EA055: Moisture Content (Dried @ 105-110°C)                                             |                                          |                          |                    |             |               |                  |             |   |
| HDPE Soil Jar (EA055)<br>0960_SS122_220622,<br>0960_SD209_220622,<br>0960_SD210_220622  | 0960_SS121_220622,<br>0960_SD302_220622, | 22-Jun-2022              | ----               | ----        | ----          | 04-Jul-2022      | 06-Jul-2022 | ✓ |
| EP231A: Perfluoroalkyl Sulfonic Acids                                                   |                                          |                          |                    |             |               |                  |             |   |
| HDPE Soil Jar (EP231X)<br>0960_SS122_220622,<br>0960_SD209_220622,<br>0960_SD210_220622 | 0960_SS121_220622,<br>0960_SD302_220622, | 22-Jun-2022              | 06-Jul-2022        | 19-Dec-2022 | ✓             | 07-Jul-2022      | 15-Aug-2022 | ✓ |
| EP231B: Perfluoroalkyl Carboxylic Acids                                                 |                                          |                          |                    |             |               |                  |             |   |
| HDPE Soil Jar (EP231X)<br>0960_SS122_220622,<br>0960_SD209_220622,<br>0960_SD210_220622 | 0960_SS121_220622,<br>0960_SD302_220622, | 22-Jun-2022              | 06-Jul-2022        | 19-Dec-2022 | ✓             | 07-Jul-2022      | 15-Aug-2022 | ✓ |
| EP231C: Perfluoroalkyl Sulfonamides                                                     |                                          |                          |                    |             |               |                  |             |   |
| HDPE Soil Jar (EP231X)<br>0960_SS122_220622,<br>0960_SD209_220622,<br>0960_SD210_220622 | 0960_SS121_220622,<br>0960_SD302_220622, | 22-Jun-2022              | 06-Jul-2022        | 19-Dec-2022 | ✓             | 07-Jul-2022      | 15-Aug-2022 | ✓ |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids                                              |                                          |                          |                    |             |               |                  |             |   |
| HDPE Soil Jar (EP231X)<br>0960_SS122_220622,<br>0960_SD209_220622,<br>0960_SD210_220622 | 0960_SS121_220622,<br>0960_SD302_220622, | 22-Jun-2022              | 06-Jul-2022        | 19-Dec-2022 | ✓             | 07-Jul-2022      | 15-Aug-2022 | ✓ |
| EP231P: PFAS Sums                                                                       |                                          |                          |                    |             |               |                  |             |   |
| HDPE Soil Jar (EP231X)<br>0960_SS122_220622,<br>0960_SD209_220622,<br>0960_SD210_220622 | 0960_SS121_220622,<br>0960_SD302_220622, | 22-Jun-2022              | 06-Jul-2022        | 19-Dec-2022 | ✓             | 07-Jul-2022      | 15-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                          |        | Count |         | Rate (%) |          |            | Quality Control Specification  |
|------------------------------------------------------|--------|-------|---------|----------|----------|------------|--------------------------------|
| Analytical Methods                                   | Method | QC    | Regular | Actual   | Expected | Evaluation |                                |
| Laboratory Duplicates (DUP)                          |        |       |         |          |          |            |                                |
| Moisture Content                                     | EA055  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Laboratory Control Samples (LCS)                     |        |       |         |          |          |            |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Method Blanks (MB)                                   |        |       |         |          |          |            |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Matrix Spikes (MS)                                   |        |       |         |          |          |            |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |



## Brief Method Summaries

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

| <i>Analytical Methods</i>                            | <i>Method</i> | <i>Matrix</i> | <i>Method Descriptions</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------------------------------|---------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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. |
| <i>Preparation Methods</i>                           | <i>Method</i> | <i>Matrix</i> | <i>Method Descriptions</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| QuEChERS Extraction of Solids                        | ORG71         | SOIL          | In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.                                                                                                                                                                                                                                   |



# CHAIN OF CUSTODY

COC#: 39255

ALS Laboratory: EP Perth

CLIENT: MWH AUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: Learmonth SW/OTH - AG

ORDER NO: pfas-omp Learmonth

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:

## SAMPLE DETAILS

## ANALYSIS REQUIRED

| SAMPLE | NAME       | DESCRIPTION | DATE / TIME         | MATRIX | TOTAL BOTTLES        | ON HOLD | Surface Waters WATER | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|------------|-------------|---------------------|--------|----------------------|---------|----------------------|----------------------|------------------------|
| 001    | 0960_SW209 |             | 22/06/2022 12:30 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8          |                      |                        |
| 002    | 0960_SW302 |             | 22/06/2022 12:40 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8          |                      |                        |
| 003    | 0960_SW210 |             | 22/06/2022 01:09 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8          |                      |                        |



# CHAIN OF CUSTODY

COC#: 39255

ALS Laboratory: EP Perth

CLIENT: MWAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: Learmonth SW/OTH - AG

ORDER NO: pfas-omp Learmonth

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:

| SAMPLE | SAMPLE NAME | PARTIAL ANALYSIS GROUP NAME | MATRIX | SELECTED ANALYSIS NAME                                                                                                                                                                                      |
|--------|-------------|-----------------------------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 001    | 0960_SW209  | Surface Waters WATER        | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 002    | 0960_SW302  | Surface Waters WATER        | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 003    | 0960_SW210  | Surface Waters WATER        | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |



# CHAIN OF CUSTODY

ALS COC#: 39255

ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: Learmonth SW/OTH - AG

ORDER NO: pfas-omp Learmonth

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:

| SAMPLE | SAMPLE NAME | BOTTLE NAME                    | VOLUME | BARCODE        | TYPE  | FILTERED | REASON |
|--------|-------------|--------------------------------|--------|----------------|-------|----------|--------|
| 001    | 0960_SW209  | Clear Plastic Bottle - Natural | 500 mL | 00070621089685 | Green | No       |        |
| 001    | 0960_SW209  | HDPE (no PTFE)                 | 20 mL  | 00350821023853 | Grey  | No       |        |
| 001    | 0960_SW209  | HDPE (no PTFE)                 | 20 mL  | 00350821023752 | Grey  | No       |        |
| 002    | 0960_SW302  | Clear Plastic Bottle - Natural | 500 mL | 00070621089924 | Green | No       |        |
| 002    | 0960_SW302  | HDPE (no PTFE)                 | 20 mL  | 00350821023969 | Grey  | No       |        |
| 002    | 0960_SW302  | HDPE (no PTFE)                 | 20 mL  | 00350821023998 | Grey  | No       |        |
| 003    | 0960_SW210  | HDPE (no PTFE)                 | 20 mL  | 00350821043232 | Grey  | No       |        |
| 003    | 0960_SW210  | HDPE (no PTFE)                 | 20 mL  | 00350821023834 | Grey  | No       |        |
| 003    | 0960_SW210  | Clear Plastic Bottle - Natural | 500 mL | 00070621089620 | Green | No       |        |

Total Bottle Count: ALS: 9, Non ALS: 0

**SAMPLE RECEIPT NOTIFICATION (SRN)****Work Order : EP2207739**

Client : **STANTEC AUSTRALIA PTY LTD**  
Contact : [REDACTED]  
Address : GROUND FLOOR 226 ADELAIDE  
TERRACE  
PERTH 6000

Laboratory : Environmental Division Perth  
Contact : [REDACTED]  
Address : 26 Rigali Way Wangara Western  
Australia Australia 6065

E-mail : [REDACTED]@stantec.com  
Telephone : ----  
Facsimile : ----

E-mail : [REDACTED]@alsglobal.com  
Telephone : +6138549 9609  
Facsimile : +61-8-9406 1399

Project : WA\_0960\_PFASOMP  
Order number : pfas-omp Learmonth  
C-O-C number : 39255  
Site : Learmonth SW/OTH - [REDACTED]  
Sampler : [REDACTED]

Page : 1 of 2  
Quote number : ES2022MWHAUS0002 (SY/139/19 B)  
QC Level : NEPM 2013 B3 & ALS QC Standard

**Dates**

Date Samples Received : 27-Jun-2022 11:40  
Client Requested Due : 08-Jul-2022  
Date

Issue Date : 28-Jun-2022  
Scheduled Reporting Date : **08-Jul-2022**

**Delivery Details**

Mode of Delivery : Carrier  
No. of coolers/boxes : 5  
Receipt Detail :

Security Seal : Not Available  
Temperature : 13.4 - Ice present  
No. of samples received / analysed : 3 / 3

**General Comments**

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- EP231X conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepancies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.





## Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exists.

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

| Laboratory sample ID | Sampling date / time | Sample ID         | WATER - EN055 - PG<br>Ionic Balance by ED037P, ED041G, ED045G &<br>WATER - EP231X<br>PFAS - Full Suite (28 analytes) | WATER - NT-01<br>Major Cations (Ca, Mg, Na, K) | WATER - NT-02<br>Major Anions (Chloride, Sulphate, Alkalinity) |
|----------------------|----------------------|-------------------|----------------------------------------------------------------------------------------------------------------------|------------------------------------------------|----------------------------------------------------------------|
| EP2207739-001        | 22-Jun-2022 12:30    | 0960_SW209_220622 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2207739-002        | 22-Jun-2022 12:40    | 0960_SW302_220622 | ✓                                                                                                                    | ✓                                              | ✓                                                              |
| EP2207739-003        | 22-Jun-2022 13:09    | 0960_SW210_220622 | ✓                                                                                                                    | ✓                                              | ✓                                                              |

## Proactive Holding Time Report

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

## Requested Deliverables

|                                                                                                                  |       |                              |
|------------------------------------------------------------------------------------------------------------------|-------|------------------------------|
| <ul style="list-style-type: none"> <li>- A4 - AU Tax Invoice (INV)</li> </ul>                                    | Email | cardno.com.au                |
| <b>DERP LAB REPORTS</b>                                                                                          |       |                              |
| <ul style="list-style-type: none"> <li>- EDI Format - ESDAT (ESDAT)</li> </ul>                                   | Email | derp.labreports@esdat.com.au |
| <ul style="list-style-type: none"> <li>- *AU Certificate of Analysis - NATA (COA)</li> </ul>                     | Email | stantec.com                  |
| <ul style="list-style-type: none"> <li>- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)</li> </ul>    | Email | stantec.com                  |
| <ul style="list-style-type: none"> <li>- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)</li> </ul>            | Email | stantec.com                  |
| <ul style="list-style-type: none"> <li>- A4 - AU Sample Receipt Notification - Environmental HT (SRN)</li> </ul> | Email | stantec.com                  |
| <ul style="list-style-type: none"> <li>- Chain of Custody (CoC) (COC)</li> </ul>                                 | Email | stantec.com                  |
| <ul style="list-style-type: none"> <li>- EDI Format - ESDAT (ESDAT)</li> </ul>                                   | Email | stantec.com                  |
| <ul style="list-style-type: none"> <li>- EDI Format - XTab (XTAB)</li> </ul>                                     | Email | stantec.com                  |

## CERTIFICATE OF ANALYSIS

**Work Order** : EP2207739  
**Client** : STANTEC AUSTRALIA PTY LTD  
**Contact** : [REDACTED]  
**Address** : GROUND FLOOR 226 ADELAIDE TERRACE  
 PERTH 6000  
**Telephone** : ----  
**Project** : WA\_0960\_PFASOMP  
**Order number** : pfas-omp Learmonth  
**C-O-C number** : 39255  
**Sampler** : [REDACTED]  
**Site** : Learmonth SW/OTH - [REDACTED]  
**Quote number** : SY/139/19 B  
**No. of samples received** : 3  
**No. of samples analysed** : 3

**Page** : 1 of 6  
**Laboratory** : Environmental Division Perth  
**Contact** : [REDACTED]  
**Address** : 26 Rigali Way Wangara Western Australia Australia 6065  
**Telephone** : +6138549 9609  
**Date Samples Received** : 27-Jun-2022 11:40  
**Date Analysis Commenced** : 28-Jun-2022  
**Issue Date** : 08-Jul-2022 13:27



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]         | Laboratory Manager (Perth) | Perth Inorganics, Wangara, Western Australia |
| [REDACTED]         | LCMS Coordinator           | Sydney Organics, Smithfield, NSW             |



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



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                        |             |      |       | 0960_SW209_220622 | 0960_SW302_220622 | 0960_SW210_220622 | ----  | ----  |
|--------------------------------------------------------|-------------|------|-------|-------------------|-------------------|-------------------|-------|-------|
| Sampling date / time                                   |             |      |       | 22-Jun-2022 12:30 | 22-Jun-2022 12:40 | 22-Jun-2022 13:09 | ----  | ----  |
| Compound                                               | CAS Number  | LOR  | Unit  | EP2207739-001     | EP2207739-002     | EP2207739-003     | ----- | ----- |
|                                                        |             |      |       | Result            | Result            | Result            | ----  | ----  |
| <b>ED037P: Alkalinity by PC Titrator</b>               |             |      |       |                   |                   |                   |       |       |
| Hydroxide Alkalinity as CaCO3                          | DMO-210-001 | 1    | mg/L  | <1                | <1                | <1                | ----  | ----  |
| Carbonate Alkalinity as CaCO3                          | 3812-32-6   | 1    | mg/L  | <1                | <1                | <1                | ----  | ----  |
| Bicarbonate Alkalinity as CaCO3                        | 71-52-3     | 1    | mg/L  | 162               | 151               | 191               | ----  | ----  |
| Total Alkalinity as CaCO3                              | ----        | 1    | mg/L  | 162               | 151               | 191               | ----  | ----  |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b> |             |      |       |                   |                   |                   |       |       |
| Sulfate as SO4 - Turbidimetric                         | 14808-79-8  | 1    | mg/L  | 1530              | 1400              | 1800              | ----  | ----  |
| <b>ED045G: Chloride by Discrete Analyser</b>           |             |      |       |                   |                   |                   |       |       |
| Chloride                                               | 16887-00-6  | 1    | mg/L  | 12600             | 11400             | 12800             | ----  | ----  |
| <b>ED093F: Dissolved Major Cations</b>                 |             |      |       |                   |                   |                   |       |       |
| Calcium                                                | 7440-70-2   | 1    | mg/L  | 315               | 274               | 342               | ----  | ----  |
| Magnesium                                              | 7439-95-4   | 1    | mg/L  | 953               | 814               | 1060              | ----  | ----  |
| Sodium                                                 | 7440-23-5   | 1    | mg/L  | 6850              | 5880              | 7620              | ----  | ----  |
| Potassium                                              | 7440-09-7   | 1    | mg/L  | 413               | 359               | 448               | ----  | ----  |
| <b>EN055: Ionic Balance</b>                            |             |      |       |                   |                   |                   |       |       |
| ∅ Total Anions                                         | ----        | 0.01 | meq/L | 390               | 354               | 402               | ----  | ----  |
| ∅ Total Cations                                        | ----        | 0.01 | meq/L | 403               | 346               | 447               | ----  | ----  |
| ∅ Ionic Balance                                        | ----        | 0.01 | %     | 1.53              | 1.16              | 5.28              | ----  | ----  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>           |             |      |       |                   |                   |                   |       |       |
| 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              | 0.04              | ----  | ----  |
| Perfluorodecane sulfonic acid (PFDS)                   | 335-77-3    | 0.02 | µg/L  | <0.02             | <0.02             | <0.02             | ----  | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>         |             |      |       |                   |                   |                   |       |       |
| 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             | ----  | ----  |



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_SW209_220622 | 0960_SW302_220622 | 0960_SW210_220622 | ----  | ----  |
|------------------------------------------------------------|-------------|------|------|-------------------|-------------------|-------------------|-------|-------|
| Sampling date / time                                       |             |      |      | 22-Jun-2022 12:30 | 22-Jun-2022 12:40 | 22-Jun-2022 13:09 | ----  | ----  |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2207739-001     | EP2207739-002     | EP2207739-003     | ----- | ----- |
|                                                            |             |      |      | Result            | Result            | Result            | ----  | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                   |                   |                   |       |       |
| 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             | ----  | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                   |                   |                   |       |       |
| 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             | ----  | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                   |                   |                   |       |       |
| 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             | ----  | ----  |



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_SW209_220622 | 0960_SW302_220622 | 0960_SW210_220622 | ----  | ----  |
|---------------------------------------------------------------|--------------------|------|------|-------------------|-------------------|-------------------|-------|-------|
| Sampling date / time                                          |                    |      |      | 22-Jun-2022 12:30 | 22-Jun-2022 12:40 | 22-Jun-2022 13:09 | ----  | ----  |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2207739-001     | EP2207739-002     | EP2207739-003     | ----- | ----- |
|                                                               |                    |      |      | Result            | Result            | Result            | ----  | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                   |                   |                   |       |       |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | ----  | ----  |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                   |                   |                   |       |       |
| Sum of PFAS                                                   | ----               | 0.01 | µg/L | <0.01             | 0.02              | 0.04              | ----  | ----  |
| Sum of PFHxS and PFOS                                         | 355-46-4/1763-23-1 | 0.01 | µg/L | <0.01             | 0.02              | 0.04              | ----  | ----  |
| Sum of PFAS (WA DER List)                                     | ----               | 0.01 | µg/L | <0.01             | 0.02              | 0.04              | ----  | ----  |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                   |                   |                   |       |       |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 98.7              | 106               | 97.8              | ----  | ----  |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 86.4              | 84.9              | 106               | ----  | ----  |

Page : 6 of 6  
Work Order : EP2207739  
Client : STANTEC AUSTRALIA PTY LTD  
Project : WA\_0960\_PFASOMP



## Surrogate Control Limits

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

## Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (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              | : EP2207739                                       | Page                    | : 1 of 11                                                |
| Client                  | : STANTEC AUSTRALIA PTY LTD                       | Laboratory              | : Environmental Division Perth                           |
| Contact                 | : [REDACTED]                                      | Contact                 | : [REDACTED]                                             |
| Address                 | : GROUND FLOOR 226 ADELAIDE TERRACE<br>PERTH 6000 | Address                 | : 26 Rigali Way Wangara Western Australia Australia 6065 |
| Telephone               | : ----                                            | Telephone               | : +6138549 9609                                          |
| Project                 | : WA_0960_PFASOMP                                 | Date Samples Received   | : 27-Jun-2022                                            |
| Order number            | : pfas-omp Learmonth                              | Date Analysis Commenced | : 28-Jun-2022                                            |
| C-O-C number            | : 39255                                           | Issue Date              | : 08-Jul-2022                                            |
| Sampler                 | : [REDACTED]                                      |                         |                                                          |
| Site                    | : Learmonth SW/OTH - [REDACTED]                   |                         |                                                          |
| Quote number            | : SY/139/19 B                                     |                         |                                                          |
| No. of samples received | : 3                                               |                         |                                                          |
| No. of samples analysed | : 3                                               |                         |                                                          |



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

This Quality Control Report contains the following information:

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

### Signatories

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

| Signatories | Position                   | Accreditation Category                       |
|-------------|----------------------------|----------------------------------------------|
| [REDACTED]  | Laboratory Manager (Perth) | Perth Inorganics, Wangara, Western Australia |
| [REDACTED]  | LCMS Coordinator           | Sydney Organics, Smithfield, NSW             |



## 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**

| Sub-Matrix: WATER                                                 |                   |                                          |             | Laboratory Duplicate (DUP) Report |      |                 |                  |         |                    |
|-------------------------------------------------------------------|-------------------|------------------------------------------|-------------|-----------------------------------|------|-----------------|------------------|---------|--------------------|
| Laboratory sample ID                                              | Sample ID         | Method: Compound                         | CAS Number  | LOR                               | Unit | Original Result | Duplicate Result | RPD (%) | Acceptable RPD (%) |
| ED037P: Alkalinity by PC Titrator (QC Lot: 4445365)               |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207732-003                                                     | Anonymous         | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 100             | 100              | 0.0     | 0% - 20%           |
|                                                                   |                   | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 100             | 100              | 0.0     | 0% - 20%           |
| EP2207893-004                                                     | Anonymous         | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                   | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 89              | 78               | 12.2    | 0% - 20%           |
|                                                                   |                   | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 89              | 78               | 12.2    | 0% - 20%           |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4429755) |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207728-001                                                     | Anonymous         | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 30              | 29               | 0.0     | 0% - 20%           |
| EP2207737-006                                                     | Anonymous         | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 1550            | 1560             | 0.8     | 0% - 20%           |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4429759) |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207739-003                                                     | 0960_SW210_220622 | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 1800            | 1810             | 0.6     | 0% - 20%           |
| EP2207812-010                                                     | Anonymous         | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 78              | 82               | 5.5     | 0% - 20%           |
| ED045G: Chloride by Discrete Analyser (QC Lot: 4429754)           |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207728-001                                                     | Anonymous         | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 240             | 243              | 1.2     | 0% - 20%           |
| EP2207737-006                                                     | Anonymous         | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 11900           | 12000            | 0.6     | 0% - 20%           |
| ED045G: Chloride by Discrete Analyser (QC Lot: 4429758)           |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207739-003                                                     | 0960_SW210_220622 | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 12800           | 11800            | 8.4     | 0% - 20%           |
| EP2207812-010                                                     | Anonymous         | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 407             | 410              | 0.8     | 0% - 20%           |
| ED093F: Dissolved Major Cations (QC Lot: 4427081)                 |                   |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207732-003                                                     | Anonymous         | ED093F: Calcium                          | 7440-70-2   | 1                                 | mg/L | 27              | 28               | 0.0     | 0% - 20%           |
|                                                                   |                   | ED093F: Magnesium                        | 7439-95-4   | 1                                 | mg/L | 3               | 3                | 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 (%) |
| ED093F: Dissolved Major Cations (QC Lot: 4427081) - continued |           |                                                           |            |                                   |      |                 |                  |         |                    |
| EP2207732-003                                                 | Anonymous | ED093F: Sodium                                            | 7440-23-5  | 1                                 | mg/L | 11              | 10               | 0.0     | 0% - 50%           |
|                                                               |           | ED093F: Potassium                                         | 7440-09-7  | 1                                 | mg/L | 5               | 5                | 0.0     | No Limit           |
| EP2207737-010                                                 | Anonymous | ED093F: Calcium                                           | 7440-70-2  | 1                                 | mg/L | 171             | 176              | 2.6     | 0% - 20%           |
|                                                               |           | ED093F: Magnesium                                         | 7439-95-4  | 1                                 | mg/L | 205             | 207              | 1.1     | 0% - 20%           |
|                                                               |           | ED093F: Sodium                                            | 7440-23-5  | 1                                 | mg/L | 2190            | 2220             | 1.3     | 0% - 20%           |
|                                                               |           | ED093F: Potassium                                         | 7440-09-7  | 1                                 | mg/L | 104             | 104              | 0.0     | 0% - 20%           |
| EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4438993)       |           |                                                           |            |                                   |      |                 |                  |         |                    |
| EP2207737-010                                                 | Anonymous | EP231X: Perfluorohexane sulfonic acid (PFHxS)             | 355-46-4   | 0.01                              | µg/L | 1.49            | 1.48             | 1.2     | 0% - 20%           |
|                                                               |           | EP231X: Perfluorooctane sulfonic acid (PFOS)              | 1763-23-1  | 0.01                              | µg/L | 0.70            | 0.67             | 4.2     | 0% - 20%           |
|                                                               |           | EP231X: Perfluorobutane sulfonic acid (PFBS)              | 375-73-5   | 0.02                              | µg/L | 0.14            | 0.13             | 0.0     | No Limit           |
|                                                               |           | EP231X: Perfluoropentane sulfonic acid (PFPeS)            | 2706-91-4  | 0.02                              | µg/L | 0.19            | 0.18             | 7.2     | No Limit           |
|                                                               |           | EP231X: Perfluoroheptane sulfonic acid (PFHpS)            | 375-92-8   | 0.02                              | µg/L | 0.08            | 0.09             | 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: 4440297)       |           |                                                           |            |                                   |      |                 |                  |         |                    |
| EP2207816-008                                                 | 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           |
| ES2222761-002                                                 | Anonymous | EP231X: Perfluorohexane sulfonic acid (PFHxS)             | 355-46-4   | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
|                                                               |           | EP231X: Perfluorooctane sulfonic acid (PFOS)              | 1763-23-1  | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
|                                                               |           | EP231X: Perfluorobutane sulfonic acid (PFBS)              | 375-73-5   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                               |           | EP231X: Perfluoropentane sulfonic acid (PFPeS)            | 2706-91-4  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                               |           | EP231X: Perfluoroheptane sulfonic acid (PFHpS)            | 375-92-8   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                               |           | EP231X: Perfluorodecane sulfonic acid (PFDS)              | 335-77-3   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
| EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4438993)     |           |                                                           |            |                                   |      |                 |                  |         |                    |
| EP2207737-010                                                 | Anonymous | 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 | 0.11            | 0.09             | 18.3    | No Limit           |
|                                                               |           | EP231X: Perfluorohexanoic acid (PFHxA)                    | 307-24-4   | 0.02                              | µg/L | 0.46            | 0.42             | 9.1     | 0% - 20%           |
|                                                               |           | EP231X: Perfluoroheptanoic acid (PFHpA)                   | 375-85-9   | 0.02                              | µg/L | 0.05            | 0.04             | 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 (PFTTeDA)             | 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: 4440297) |            |                                   |      |                 |                  |         |                    |



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 (%) |
| EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4440297) - continued |           |                                                                   |            |                                   |      |                 |                  |         |                    |
| EP2207816-008                                                         | Anonymous | EP231X: Perfluorooctanoic acid (PFOA)                             | 335-67-1   | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
|                                                                       |           | EP231X: Perfluoropentanoic acid (PFPeA)                           | 2706-90-3  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |           | EP231X: Perfluorohexanoic acid (PFHxA)                            | 307-24-4   | 0.02                              | µg/L | <0.02           | <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           |
| ES2222761-002                                                         | Anonymous | EP231X: Perfluorooctanoic acid (PFOA)                             | 335-67-1   | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
|                                                                       |           | EP231X: Perfluoropentanoic acid (PFPeA)                           | 2706-90-3  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |           | EP231X: Perfluorohexanoic acid (PFHxA)                            | 307-24-4   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |           | EP231X: Perfluoroheptanoic acid (PFHpA)                           | 375-85-9   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |           | EP231X: Perfluorononanoic acid (PFNA)                             | 375-95-1   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |           | EP231X: Perfluorodecanoic acid (PFDA)                             | 335-76-2   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |           | EP231X: Perfluoroundecanoic acid (PFUnDA)                         | 2058-94-8  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |           | EP231X: Perfluorododecanoic acid (PFDoDA)                         | 307-55-1   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |           | EP231X: Perfluorotridecanoic acid (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: 4438993)                 |           |                                                                   |            |                                   |      |                 |                  |         |                    |
| EP2207737-010                                                         | Anonymous | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |           | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |           | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |           | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8 | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                       |           | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                       |           | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7 | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                       |           | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
| EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4440297)                 |           |                                                                   |            |                                   |      |                 |                  |         |                    |
| EP2207816-008                                                         | Anonymous | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |           | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |



Sub-Matrix: **WATER**

| Sub-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: 4440297) - continued |           |                                                                   |             |                                   |      |                 |                  |         |                    |
| EP2207816-008                                                     | Anonymous | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                   |           | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |           | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |           | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |           | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
| ES2222761-002                                                     | Anonymous | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                   |           | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                   |           | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                   |           | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |           | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |           | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |           | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4438993)      |           |                                                                   |             |                                   |      |                 |                  |         |                    |
| EP2207737-010                                                     | Anonymous | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |           | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 27619-97-2  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |           | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | 39108-34-4  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |           | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | 120226-60-0 | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4440297)      |           |                                                                   |             |                                   |      |                 |                  |         |                    |
| EP2207816-008                                                     | Anonymous | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |           | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 27619-97-2  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |           | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | 39108-34-4  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |           | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | 120226-60-0 | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |

Page : 6 of 11  
 Work Order : EP2207739  
 Client : STANTEC AUSTRALIA PTY LTD  
 Project : WA\_0960\_PFASOMP



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 (%) |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4440297) - continued |           |                                                     |             |                                   |      |                 |                  |         |                    |
| ES2222761-002                                                            | Anonymous | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)   | 757124-72-4 | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                          |           | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)   | 27619-97-2  | 0.05                              | µg/L | 0.10            | 0.10             | 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: 4438993)                                      |           |                                                     |             |                                   |      |                 |                  |         |                    |
| EP2207737-010                                                            | Anonymous | EP231X: Sum of PFAS                                 | ----        | 0.01                              | µg/L | 3.28            | 3.16             | 3.7     | 0% - 20%           |
| EP231P: PFAS Sums (QC Lot: 4440297)                                      |           |                                                     |             |                                   |      |                 |                  |         |                    |
| EP2207816-008                                                            | Anonymous | EP231X: Sum of PFAS                                 | ----        | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
| ES2222761-002                                                            | Anonymous | EP231X: Sum of PFAS                                 | ----        | 0.01                              | µg/L | 0.10            | 0.10             | 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**

| Sub-Matrix: WATER                                                |             |      |      | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |      |
|------------------------------------------------------------------|-------------|------|------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|------|
|                                                                  |             |      |      |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |      |
| Method: Compound                                                 | CAS Number  | LOR  | Unit | Result                      |                                       |                           |                                   |      |
| ED037P: Alkalinity by PC Titrator (QCLot: 4445365)               |             |      |      |                             |                                       |                           |                                   |      |
| ED037-P: Hydroxide Alkalinity as CaCO3                           | DMO-210-001 | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Carbonate Alkalinity as CaCO3                           | 3812-32-6   | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Bicarbonate Alkalinity as CaCO3                         | 71-52-3     | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Total Alkalinity as CaCO3                               | ----        | 1    | mg/L | <1                          | 20 mg/L                               | 102                       | 87.8                              | 118  |
|                                                                  |             |      |      | <1                          | 200 mg/L                              | 96.5                      | 87.8                              | 118  |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4429755) |             |      |      |                             |                                       |                           |                                   |      |
| ED041G: Sulfate as SO4 - Turbidimetric                           | 14808-79-8  | 1    | mg/L | <1                          | 25 mg/L                               | 102                       | 89.9                              | 112  |
|                                                                  |             |      |      | <1                          | 500 mg/L                              | 103                       | 89.9                              | 112  |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4429759) |             |      |      |                             |                                       |                           |                                   |      |
| ED041G: Sulfate as SO4 - Turbidimetric                           | 14808-79-8  | 1    | mg/L | <1                          | 25 mg/L                               | 96.1                      | 89.9                              | 112  |
|                                                                  |             |      |      | <1                          | 500 mg/L                              | 103                       | 89.9                              | 112  |
| ED045G: Chloride by Discrete Analyser (QCLot: 4429754)           |             |      |      |                             |                                       |                           |                                   |      |
| ED045G: Chloride                                                 | 16887-00-6  | 1    | mg/L | <1                          | 10 mg/L                               | 108                       | 88.6                              | 113  |
|                                                                  |             |      |      | <1                          | 1000 mg/L                             | 100                       | 88.6                              | 113  |
| ED045G: Chloride by Discrete Analyser (QCLot: 4429758)           |             |      |      |                             |                                       |                           |                                   |      |
| ED045G: Chloride                                                 | 16887-00-6  | 1    | mg/L | <1                          | 10 mg/L                               | 109                       | 88.6                              | 113  |
|                                                                  |             |      |      | <1                          | 1000 mg/L                             | 102                       | 88.6                              | 113  |
| ED093F: Dissolved Major Cations (QCLot: 4427081)                 |             |      |      |                             |                                       |                           |                                   |      |
| ED093F: Calcium                                                  | 7440-70-2   | 1    | mg/L | <1                          | 50 mg/L                               | 91.4                      | 86.5                              | 117  |
| ED093F: Magnesium                                                | 7439-95-4   | 1    | mg/L | <1                          | 50 mg/L                               | 94.0                      | 88.4                              | 110  |
| ED093F: Sodium                                                   | 7440-23-5   | 1    | mg/L | <1                          | 50 mg/L                               | 106                       | 91.4                              | 113  |
| ED093F: Potassium                                                | 7440-09-7   | 1    | mg/L | <1                          | 50 mg/L                               | 95.1                      | 84.6                              | 108  |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4438993)           |             |      |      |                             |                                       |                           |                                   |      |
| EP231X: Perfluorobutane sulfonic acid (PFBS)                     | 375-73-5    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 100                       | 72.0                              | 130  |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)                   | 2706-91-4   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 92.0                      | 71.0                              | 127  |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)                    | 355-46-4    | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 98.0                      | 68.0                              | 131  |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)                   | 375-92-8    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 100                       | 69.0                              | 134  |
| EP231X: Perfluorooctane sulfonic acid (PFOS)                     | 1763-23-1   | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 84.0                      | 65.0                              | 140  |
| EP231X: Perfluorodecane sulfonic acid (PFDS)                     | 335-77-3    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 88.0                      | 53.0                              | 142  |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4440297)           |             |      |      |                             |                                       |                           |                                   |      |
| EP231X: Perfluorobutane sulfonic acid (PFBS)                     | 375-73-5    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 110                       | 72.0                              | 130  |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)                   | 2706-91-4   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 110                       | 71.0                              | 127  |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)                    | 355-46-4    | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 101                       | 68.0                              | 131  |





Sub-Matrix: **WATER**

| Sub-Matrix: WATER                                                  |            |      |      | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |     |
|--------------------------------------------------------------------|------------|------|------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|-----|
|                                                                    |            |      |      |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |     |
| Method: Compound                                                   | CAS Number | LOR  | Unit | Result                      |                                       |                           |                                   |     |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4440297) - continued |            |      |      |                             |                                       |                           |                                   |     |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)                     | 375-92-8   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 109                       | 69.0                              | 134 |
| EP231X: Perfluorooctane sulfonic acid (PFOS)                       | 1763-23-1  | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 106                       | 65.0                              | 140 |
| EP231X: Perfluorodecane sulfonic acid (PFDS)                       | 335-77-3   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 103                       | 53.0                              | 142 |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4438993)           |            |      |      |                             |                                       |                           |                                   |     |
| EP231X: Perfluorobutanoic acid (PFBA)                              | 375-22-4   | 0.1  | µg/L | <0.1                        | 1.25 µg/L                             | 94.8                      | 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                             | 112                       | 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                             | 108                       | 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                             | 122                       | 71.0                              | 129 |
| EP231X: Perfluoroundecanoic acid (PFUnDA)                          | 2058-94-8  | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 90.0                      | 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                             | 102                       | 65.0                              | 144 |
| EP231X: Perfluorotetradecanoic acid (PFTeDA)                       | 376-06-7   | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 87.2                      | 71.0                              | 132 |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4440297)           |            |      |      |                             |                                       |                           |                                   |     |
| 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                             | 111                       | 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                             | 114                       | 72.0                              | 130 |
| EP231X: Perfluorooctanoic acid (PFOA)                              | 335-67-1   | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 117                       | 71.0                              | 133 |
| EP231X: Perfluorononanoic acid (PFNA)                              | 375-95-1   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 120                       | 69.0                              | 130 |
| EP231X: Perfluorodecanoic acid (PFDA)                              | 335-76-2   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 114                       | 71.0                              | 129 |
| EP231X: Perfluoroundecanoic acid (PFUnDA)                          | 2058-94-8  | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 109                       | 69.0                              | 133 |
| EP231X: Perfluorododecanoic acid (PFDoDA)                          | 307-55-1   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 114                       | 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                            | 105                       | 71.0                              | 132 |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4438993)               |            |      |      |                             |                                       |                           |                                   |     |
| EP231X: Perfluorooctane sulfonamide (FOSA)                         | 754-91-6   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 116                       | 67.0                              | 137 |
| EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)              | 31506-32-8 | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 98.4                      | 68.0                              | 141 |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)               | 4151-50-2  | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 98.4                      | 62.6                              | 147 |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)       | 24448-09-7 | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 119                       | 66.0                              | 145 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)        | 1691-99-2  | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 79.2                      | 57.6                              | 145 |
| EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)  | 2355-31-9  | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 108                       | 65.0                              | 136 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)   | 2991-50-6  | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 100                       | 61.0                              | 135 |



Sub-Matrix: **WATER**

| Method: Compound                                                   |             |      |        | Method Blank (MB) Report | Laboratory Control Spike (LCS) Report |                    |                       |      |
|--------------------------------------------------------------------|-------------|------|--------|--------------------------|---------------------------------------|--------------------|-----------------------|------|
|                                                                    |             |      |        |                          | Spike Concentration                   | Spike Recovery (%) | Acceptable Limits (%) |      |
|                                                                    |             |      |        |                          |                                       | LCS                | Low                   | High |
| CAS Number                                                         | LOR         | Unit | Result |                          |                                       |                    |                       |      |
| <b>EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4440297)</b>        |             |      |        |                          |                                       |                    |                       |      |
| 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                            | 108                | 68.0                  | 141  |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)               | 4151-50-2   | 0.05 | µg/L   | <0.05                    | 0.625 µg/L                            | 110                | 62.6                  | 147  |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)       | 24448-09-7  | 0.05 | µg/L   | <0.05                    | 0.625 µg/L                            | 103                | 66.0                  | 145  |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)        | 1691-99-2   | 0.05 | µg/L   | <0.05                    | 0.625 µg/L                            | 108                | 57.6                  | 145  |
| EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)  | 2355-31-9   | 0.02 | µg/L   | <0.02                    | 0.25 µg/L                             | 119                | 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  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4438993)</b> |             |      |        |                          |                                       |                    |                       |      |
| EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                  | 757124-72-4 | 0.05 | µg/L   | <0.05                    | 0.25 µg/L                             | 100                | 63.0                  | 143  |
| EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                  | 27619-97-2  | 0.05 | µg/L   | <0.05                    | 0.25 µg/L                             | 120                | 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                             | 104                | 67.0                  | 138  |
| EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)                | 120226-60-0 | 0.05 | µg/L   | <0.05                    | 0.25 µg/L                             | 98.0               | 71.4                  | 144  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4440297)</b> |             |      |        |                          |                                       |                    |                       |      |
| EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                  | 757124-72-4 | 0.05 | µg/L   | <0.05                    | 0.25 µg/L                             | 114                | 63.0                  | 143  |
| EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                  | 27619-97-2  | 0.05 | µg/L   | <0.05                    | 0.25 µg/L                             | 115                | 64.0                  | 140  |
| EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                  | 39108-34-4  | 0.05 | µg/L   | <0.05                    | 0.25 µg/L                             | 117                | 67.0                  | 138  |
| EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)                | 120226-60-0 | 0.05 | µg/L   | <0.05                    | 0.25 µg/L                             | 107                | 71.4                  | 144  |

## Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

| Laboratory sample ID                                                    |                   |                                        |            | Matrix Spike (MS) Report |                  |                       |      |
|-------------------------------------------------------------------------|-------------------|----------------------------------------|------------|--------------------------|------------------|-----------------------|------|
|                                                                         |                   |                                        |            | Spike Concentration      | SpikeRecovery(%) | Acceptable Limits (%) |      |
|                                                                         |                   |                                        |            |                          | MS               | Low                   | High |
| Sample ID                                                               | Method: Compound  | CAS Number                             |            |                          |                  |                       |      |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4429755)</b> |                   |                                        |            |                          |                  |                       |      |
| EP2207728-001                                                           | Anonymous         | ED041G: Sulfate as SO4 - Turbidimetric | 14808-79-8 | 100 mg/L                 | 93.7             | 70.4                  | 130  |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4429759)</b> |                   |                                        |            |                          |                  |                       |      |
| EP2207739-003                                                           | 0960_SW210_220622 | ED041G: Sulfate as SO4 - Turbidimetric | 14808-79-8 | 100 mg/L                 | # Not Determined | 70.4                  | 130  |
| <b>ED045G: Chloride by Discrete Analyser (QCLot: 4429754)</b>           |                   |                                        |            |                          |                  |                       |      |
| EP2207728-001                                                           | Anonymous         | ED045G: Chloride                       | 16887-00-6 | 1000 mg/L                | 93.8             | 70.0                  | 130  |
| <b>ED045G: Chloride by Discrete Analyser (QCLot: 4429758)</b>           |                   |                                        |            |                          |                  |                       |      |
| EP2207739-003                                                           | 0960_SW210_220622 |                                        |            |                          |                  |                       |      |



Sub-Matrix: **WATER**

| Sub-Matrix: WATER                                                  |                   |                                                                   |             | Matrix Spike (MS) Report |                  |                       |      |
|--------------------------------------------------------------------|-------------------|-------------------------------------------------------------------|-------------|--------------------------|------------------|-----------------------|------|
|                                                                    |                   |                                                                   |             | Spike                    | SpikeRecovery(%) | Acceptable Limits (%) |      |
| Laboratory sample ID                                               | Sample ID         | Method: Compound                                                  | CAS Number  | Concentration            | MS               | Low                   | High |
| ED045G: Chloride by Discrete Analyser (QCLot: 4429758) - continued |                   |                                                                   |             |                          |                  |                       |      |
| EP2207739-003                                                      | 0960_SW210_220622 | ED045G: Chloride                                                  | 16887-00-6  | 1000 mg/L                | # Not Determined | 70.0                  | 130  |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4440297)             |                   |                                                                   |             |                          |                  |                       |      |
| ES2222761-001                                                      | Anonymous         | EP231X: Perfluorobutane sulfonic acid (PFBS)                      | 375-73-5    | 0.25 µg/L                | 113              | 72.0                  | 130  |
|                                                                    |                   | EP231X: Perfluoropentane sulfonic acid (PFPeS)                    | 2706-91-4   | 0.25 µg/L                | 108              | 71.0                  | 127  |
|                                                                    |                   | EP231X: Perfluorohexane sulfonic acid (PFHxS)                     | 355-46-4    | 0.25 µg/L                | 102              | 68.0                  | 131  |
|                                                                    |                   | EP231X: Perfluoroheptane sulfonic acid (PFHpS)                    | 375-92-8    | 0.25 µg/L                | 106              | 69.0                  | 134  |
|                                                                    |                   | EP231X: Perfluorooctane sulfonic acid (PFOS)                      | 1763-23-1   | 0.25 µg/L                | 104              | 65.0                  | 140  |
|                                                                    |                   | EP231X: Perfluorodecane sulfonic acid (PFDS)                      | 335-77-3    | 0.25 µg/L                | 105              | 53.0                  | 142  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4440297)           |                   |                                                                   |             |                          |                  |                       |      |
| ES2222761-001                                                      | Anonymous         | EP231X: Perfluorobutanoic acid (PFBA)                             | 375-22-4    | 1.25 µg/L                | 97.7             | 73.0                  | 129  |
|                                                                    |                   | EP231X: Perfluoropentanoic acid (PFPeA)                           | 2706-90-3   | 0.25 µg/L                | 112              | 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                | 111              | 72.0                  | 130  |
|                                                                    |                   | EP231X: Perfluorooctanoic acid (PFOA)                             | 335-67-1    | 0.25 µg/L                | 111              | 71.0                  | 133  |
|                                                                    |                   | EP231X: Perfluorononanoic acid (PFNA)                             | 375-95-1    | 0.25 µg/L                | 121              | 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                | 115              | 72.0                  | 134  |
|                                                                    |                   | EP231X: Perfluorotridecanoic acid (PFTrDA)                        | 72629-94-8  | 0.25 µg/L                | 109              | 65.0                  | 144  |
|                                                                    |                   | EP231X: Perfluorotetradecanoic acid (PFTeDA)                      | 376-06-7    | 0.625 µg/L               | 95.0             | 71.0                  | 132  |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4440297)               |                   |                                                                   |             |                          |                  |                       |      |
| ES2222761-001                                                      | Anonymous         | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.25 µg/L                | 109              | 67.0                  | 137  |
|                                                                    |                   | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.625 µg/L               | 101              | 68.0                  | 141  |
|                                                                    |                   | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.625 µg/L               | 102              | 62.6                  | 147  |
|                                                                    |                   | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.625 µg/L               | 93.0             | 66.0                  | 145  |
|                                                                    |                   | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.625 µg/L               | 110              | 57.6                  | 145  |
|                                                                    |                   | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9   | 0.25 µg/L                | 109              | 65.0                  | 136  |
|                                                                    |                   | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.25 µg/L                | 110              | 61.0                  | 135  |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4440297)        |                   |                                                                   |             |                          |                  |                       |      |
| ES2222761-001                                                      | Anonymous         | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.25 µg/L                | 109              | 63.0                  | 143  |
|                                                                    |                   | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 27619-97-2  | 0.25 µg/L                | 118              | 64.0                  | 140  |
|                                                                    |                   | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | 39108-34-4  | 0.25 µg/L                | 119              | 67.0                  | 138  |



Sub-Matrix: WATER

|                                                                         |           |                                                     |             | Matrix Spike (MS) Report |                  |                       |      |
|-------------------------------------------------------------------------|-----------|-----------------------------------------------------|-------------|--------------------------|------------------|-----------------------|------|
|                                                                         |           |                                                     |             | Spike                    | SpikeRecovery(%) | Acceptable Limits (%) |      |
| Laboratory sample ID                                                    | Sample ID | Method: Compound                                    | CAS Number  | Concentration            | MS               | Low                   | High |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4440297) - continued |           |                                                     |             |                          |                  |                       |      |
| ES2222761-001                                                           | Anonymous | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS) | 120226-60-0 | 0.25 µg/L                | 109              | 71.4                  | 144  |

## QA/QC Compliance Assessment to assist with Quality Review

|              |                                 |                         |                                |
|--------------|---------------------------------|-------------------------|--------------------------------|
| Work Order   | : EP2207739                     | Page                    | : 1 of 5                       |
| Client       | : STANTEC AUSTRALIA PTY LTD     | Laboratory              | : Environmental Division Perth |
| Contact      | : [REDACTED]                    | Telephone               | : +6138549 9609                |
| Project      | : WA_0960_PFASOMP               | Date Samples Received   | : 27-Jun-2022                  |
| Site         | : Learmonth SW/OTH - [REDACTED] | Issue Date              | : 08-Jul-2022                  |
| Sampler      | : [REDACTED]                    | No. of samples received | : 3                            |
| Order number | : pfas-omp Learmonth            | No. of samples analysed | : 3                            |

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

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

### Summary of Outliers

#### Outliers : Quality Control Samples

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

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

#### Outliers : Analysis Holding Time Compliance

- Analysis Holding Time Outliers exist - please see following pages for full details.

#### Outliers : Frequency of Quality Control Samples

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

*Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes*

| Compound Group Name                             | Laboratory Sample ID | Client Sample ID  | Analyte                               | CAS Number | Data           | Limits | Comment                                                                                      |
|-------------------------------------------------|----------------------|-------------------|---------------------------------------|------------|----------------|--------|----------------------------------------------------------------------------------------------|
| <b>Matrix Spike (MS) Recoveries</b>             |                      |                   |                                       |            |                |        |                                                                                              |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA | EP2207739--003       | 0960_SW210_220622 | <b>Sulfate as SO4 - Turbidimetric</b> | 14808-79-8 | Not Determined | ----   | <b>MS recovery not determined, background level greater than or equal to 4x spike level.</b> |
| ED045G: Chloride by Discrete Analyser           | EP2207739--003       | 0960_SW210_220622 | <b>Chloride</b>                       | 16887-00-6 | Not Determined | ----   | <b>MS recovery not determined, background level greater than or equal to 4x spike level.</b> |

| Method                            |                    | Extraction / Preparation |                    |              | Analysis      |                  |              |
|-----------------------------------|--------------------|--------------------------|--------------------|--------------|---------------|------------------|--------------|
| Container / Client Sample ID(s)   |                    | Date extracted           | Due for extraction | Days overdue | Date analysed | Due for analysis | Days overdue |
| ED037P: Alkalinity by PC Titrator |                    |                          |                    |              |               |                  |              |
| Clear Plastic Bottle - Natural    |                    |                          |                    |              |               |                  |              |
| 0960_SW209_220622,                | 0960_SW302_220622, | ----                     | ----               | ----         | 07-Jul-2022   | 06-Jul-2022      | 1            |
| 0960_SW210_220622                 |                    |                          |                    |              |               |                  |              |

| Quality Control Sample Type                          | Count |         | Rate (%) |          | Quality Control Specification  |
|------------------------------------------------------|-------|---------|----------|----------|--------------------------------|
| Method                                               | QC    | Regular | Actual   | Expected |                                |
| Laboratory Duplicates (DUP)                          |       |         |          |          |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | 3     | 39      | 7.69     | 10.00    | NEPM 2013 B3 & ALS QC Standard |
| Matrix Spikes (MS)                                   |       |         |          |          |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | 1     | 39      | 2.56     | 5.00     | NEPM 2013 B3 & ALS QC Standard |

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



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                                                              |                    | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |
|-------------------------------------------------------------------------------------|--------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|
| Container / Client Sample ID(s)                                                     |                    |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| ED037P: Alkalinity by PC Titrator                                                   |                    |             |                          |                    |            |               |                  |            |
| Clear Plastic Bottle - Natural (ED037-P)<br>0960_SW209_220622,<br>0960_SW210_220622 | 0960_SW302_220622, | 22-Jun-2022 | ----                     | ----               | ----       | 07-Jul-2022   | 06-Jul-2022      | ✖          |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA                                     |                    |             |                          |                    |            |               |                  |            |
| Clear Plastic Bottle - Natural (ED041G)<br>0960_SW210_220622                        |                    | 22-Jun-2022 | ----                     | ----               | ----       | 06-Jul-2022   | 20-Jul-2022      | ✔          |
| Clear Plastic Bottle - Natural (ED041G)<br>0960_SW209_220622,                       | 0960_SW302_220622  | 22-Jun-2022 | ----                     | ----               | ----       | 08-Jul-2022   | 20-Jul-2022      | ✔          |
| ED045G: Chloride by Discrete Analyser                                               |                    |             |                          |                    |            |               |                  |            |
| Clear Plastic Bottle - Natural (ED045G)<br>0960_SW210_220622                        |                    | 22-Jun-2022 | ----                     | ----               | ----       | 06-Jul-2022   | 20-Jul-2022      | ✔          |
| Clear Plastic Bottle - Natural (ED045G)<br>0960_SW209_220622,                       | 0960_SW302_220622  | 22-Jun-2022 | ----                     | ----               | ----       | 08-Jul-2022   | 20-Jul-2022      | ✔          |
| ED093F: Dissolved Major Cations                                                     |                    |             |                          |                    |            |               |                  |            |
| Clear Plastic Bottle - Natural (ED093F)<br>0960_SW209_220622,<br>0960_SW210_220622  | 0960_SW302_220622, | 22-Jun-2022 | ----                     | ----               | ----       | 28-Jun-2022   | 29-Jun-2022      | ✔          |
| EP231A: Perfluoroalkyl Sulfonic Acids                                               |                    |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)<br>0960_SW209_220622,                                       | 0960_SW302_220622  | 22-Jun-2022 | 05-Jul-2022              | 19-Dec-2022        | ✔          | 06-Jul-2022   | 19-Dec-2022      | ✔          |
| HDPE (no PTFE) (EP231X)<br>0960_SW210_220622                                        |                    | 22-Jun-2022 | 06-Jul-2022              | 19-Dec-2022        | ✔          | 07-Jul-2022   | 19-Dec-2022      | ✔          |
| EP231B: Perfluoroalkyl Carboxylic Acids                                             |                    |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)<br>0960_SW209_220622,                                       | 0960_SW302_220622  | 22-Jun-2022 | 05-Jul-2022              | 19-Dec-2022        | ✔          | 06-Jul-2022   | 19-Dec-2022      | ✔          |
| HDPE (no PTFE) (EP231X)<br>0960_SW210_220622                                        |                    | 22-Jun-2022 | 06-Jul-2022              | 19-Dec-2022        | ✔          | 07-Jul-2022   | 19-Dec-2022      | ✔          |
| EP231C: Perfluoroalkyl Sulfonamides                                                 |                    |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)<br>0960_SW209_220622,                                       | 0960_SW302_220622  | 22-Jun-2022 | 05-Jul-2022              | 19-Dec-2022        | ✔          | 06-Jul-2022   | 19-Dec-2022      | ✔          |
| HDPE (no PTFE) (EP231X)<br>0960_SW210_220622                                        |                    | 22-Jun-2022 | 06-Jul-2022              | 19-Dec-2022        | ✔          | 07-Jul-2022   | 19-Dec-2022      | ✔          |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids                                          |                    |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)<br>0960_SW209_220622,                                       | 0960_SW302_220622  | 22-Jun-2022 | 05-Jul-2022              | 19-Dec-2022        | ✔          | 06-Jul-2022   | 19-Dec-2022      | ✔          |
| HDPE (no PTFE) (EP231X)<br>0960_SW210_220622                                        |                    | 22-Jun-2022 | 06-Jul-2022              | 19-Dec-2022        | ✔          | 07-Jul-2022   | 19-Dec-2022      | ✔          |
| EP231P: PFAS Sums                                                                   |                    |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)<br>0960_SW209_220622,                                       | 0960_SW302_220622  | 22-Jun-2022 | 05-Jul-2022              | 19-Dec-2022        | ✔          | 06-Jul-2022   | 19-Dec-2022      | ✔          |
| HDPE (no PTFE) (EP231X)<br>0960_SW210_220622                                        |                    | 22-Jun-2022 | 06-Jul-2022              | 19-Dec-2022        | ✔          | 07-Jul-2022   | 19-Dec-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                            |         | Count |         | Rate (%) |          | Quality Control Specification |                                |
|--------------------------------------------------------|---------|-------|---------|----------|----------|-------------------------------|--------------------------------|
| Analytical Methods                                     | Method  | QC    | Regular | Actual   | Expected |                               | Evaluation                     |
|                                                        |         |       |         |          |          |                               |                                |
| Laboratory Duplicates (DUP)                            |         |       |         |          |          |                               |                                |
| Alkalinity by Auto Titrator                            | ED037-P | 2     | 20      | 10.00    | 10.00    | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 4     | 40      | 10.00    | 10.00    | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 2     | 19      | 10.53    | 10.00    | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 3     | 39      | 7.69     | 10.00    | ✗                             | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 4     | 40      | 10.00    | 10.00    | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Laboratory Control Samples (LCS)                       |         |       |         |          |          |                               |                                |
| Alkalinity by Auto Titrator                            | ED037-P | 2     | 20      | 10.00    | 10.00    | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 4     | 40      | 10.00    | 10.00    | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 1     | 19      | 5.26     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 2     | 39      | 5.13     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 4     | 40      | 10.00    | 10.00    | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Method Blanks (MB)                                     |         |       |         |          |          |                               |                                |
| Alkalinity by Auto Titrator                            | ED037-P | 1     | 20      | 5.00     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 2     | 40      | 5.00     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 1     | 19      | 5.26     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 2     | 39      | 5.13     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 2     | 40      | 5.00     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Matrix Spikes (MS)                                     |         |       |         |          |          |                               |                                |
| Chloride by Discrete Analyser                          | ED045G  | 2     | 40      | 5.00     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 39      | 2.56     | 5.00     | ✗                             | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 2     | 40      | 5.00     | 5.00     | ✓                             | NEPM 2013 B3 & ALS QC Standard |



## Brief Method Summaries

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

| Analytical Methods                                                 | Method       | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------------------|--------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alkalinity by Auto Titrator                                        | ED037-P      | WATER  | In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                                                                                                                                                                                                                |
| Sulfate (Turbidimetric) as SO <sub>4</sub> 2- by Discrete Analyser | ED041G       | WATER  | In house: Referenced to APHA 4500-SO <sub>4</sub> . Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO <sub>4</sub> suspension is measured by a photometer and the SO <sub>4</sub> -2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                         |
| Chloride by Discrete Analyser                                      | ED045G       | WATER  | In house: Referenced to APHA 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm.                                                                                                                                                                                                                                                                                                                                                                |
| Major Cations - Dissolved                                          | ED093F       | WATER  | In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                           |
| Ionic Balance by PCT DA and Turbi SO <sub>4</sub> DA               | * EN055 - PG | WATER  | In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS               | EP231X       | WATER  | In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements. |
| Preparation Methods                                                | Method       | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Solid Phase Extraction (SPE) for PFAS in water                     | ORG72        | WATER  | In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.                                                                                                                                                                                                |



# CHAIN OF CUSTODY

COC#: 39277

ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: Learmonth GW - MB

ORDER NO: pfas-omp Learmonth

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:

## SAMPLE DETAILS

## ANALYSIS REQUIRED

| SAMPLE | NAME                    | DESCRIPTION | DATE / TIME         | MATRIX | TOTAL BOTTLES        | ON HOLD | Ground Waters WATER | Rinsate WATER | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|-------------------------|-------------|---------------------|--------|----------------------|---------|---------------------|---------------|----------------------|------------------------|
| 001    | 0960_MW134              |             | 23/06/2022 08:21 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |               |                      |                        |
| 002    | 0960_MW141_1.5-2        |             | 23/06/2022 10:08 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |               |                      |                        |
| 003    | 0960_MW140_1.5-2        |             | 23/06/2022 11:21 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |               |                      |                        |
| 004    | 0960_MW147_3-3.5        |             | 23/06/2022 12:22 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |               |                      |                        |
| 005    | 0960_MW181_3.5-4_220623 |             | 23/06/2022 12:25 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |               |                      |                        |
| 006    | 0960_MW180_1-1.5        |             | 23/06/2022 12:57 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |               |                      |                        |
| 007    | 0960_MW135_2.5-3        |             | 23/06/2022 01:59 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |               |                      |                        |
| 008    | 0960_QC301              |             | 23/06/2022 03:19 PM | Water  | ALS: 2<br>Non ALS: 0 | No      |                     | X             |                      |                        |
| 009    | 0960_QC302              |             | 23/06/2022 03:18 PM | Water  | ALS: 2<br>Non ALS: 0 | No      |                     | X             |                      |                        |



# CHAIN OF CUSTODY

COC#: 39277

ALS Laboratory: EP Perth

CLIENT: MWH AUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: Learmonth GW - MB

ORDER NO: pfas-omp Learmonth

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:

## SAMPLE DETAILS

## ANALYSIS REQUIRED

| SAMPLE | NAME       | DESCRIPTION | DATE / TIME         | MATRIX | TOTAL BOTTLES        | ON HOLD | Ground Waters WATER | Rinsate WATER | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|------------|-------------|---------------------|--------|----------------------|---------|---------------------|---------------|----------------------|------------------------|
| 010    | 0960_QC401 |             | 23/06/2022 03:17 PM | Water  | ALS: 2<br>Non ALS: 0 | No      |                     | X             |                      |                        |
| 011    | 0960_QC402 |             | 23/06/2022 03:17 PM | Water  | ALS: 2<br>Non ALS: 0 | No      |                     | X             |                      |                        |

**CHAIN OF CUSTODY**

COC#: 39277

ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: Learmonth GW - MB

ORDER NO: pfas-omp Learmonth

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:

| SAMPLE | SAMPLE NAME             | PARTIAL ANALYSIS GROUP NAME | MATRIX | SELECTED ANALYSIS NAME                                                                                                                                                                                      |
|--------|-------------------------|-----------------------------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 001    | 0960_MW134              | Ground Waters WATER         | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 002    | 0960_MW141_1.5-2        | Ground Waters WATER         | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 003    | 0960_MW140_1.5-2        | Ground Waters WATER         | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 004    | 0960_MW147_3-3.5        | Ground Waters WATER         | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 005    | 0960_MW181_3.5-4_220623 | Ground Waters WATER         | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 006    | 0960_MW180_1-1.5        | Ground Waters WATER         | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 007    | 0960_MW135_2.5-3        | Ground Waters WATER         | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |



# CHAIN OF CUSTODY

COC#: 39277

ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: Learmonth GW - MB

ORDER NO: pfas-omp Learmonth

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:

| SAMPLE | SAMPLE NAME      | BOTTLE NAME                    | VOLUME | BARCODE        | TYPE  | FILTERED | REASON |
|--------|------------------|--------------------------------|--------|----------------|-------|----------|--------|
| 001    | 0960_MW134       | Clear Plastic Bottle - Natural | 500 mL | 00070621089646 | Green | No       |        |
| 001    | 0960_MW134       | HDPE (no PTFE)                 | 20 mL  | 00350821023802 | Grey  | No       |        |
| 001    | 0960_MW134       | HDPE (no PTFE)                 | 20 mL  | 00350821023779 | Grey  | No       |        |
| 002    | 0960_MW141_1.5-2 | HDPE (no PTFE)                 | 20 mL  | 00350821023841 | Grey  | No       |        |
| 002    | 0960_MW141_1.5-2 | HDPE (no PTFE)                 | 20 mL  | 00350821023927 | Grey  | No       |        |
| 002    | 0960_MW141_1.5-2 | Clear Plastic Bottle - Natural | 500 mL | 00070621089850 | Green | No       |        |
| 003    | 0960_MW140_1.5-2 | Clear Plastic Bottle - Natural | 500 mL | 00070621191262 | Green | No       |        |
| 003    | 0960_MW140_1.5-2 | HDPE (no PTFE)                 | 20 mL  | 00352101070876 | Grey  | No       |        |
| 003    | 0960_MW140_1.5-2 | HDPE (no PTFE)                 | 20 mL  | 00352101071577 | Grey  | No       |        |
| 004    | 0960_MW147_3-3.5 | Clear Plastic Bottle - Natural | 500 mL | 00070621172066 | Green | No       |        |
| 004    | 0960_MW147_3-3.5 | HDPE (no PTFE)                 | 20 mL  | 00350621041292 | Grey  | No       |        |
| 004    | 0960_MW147_3-3.5 | HDPE (no PTFE)                 | 20 mL  | 00350621041330 | Grey  | No       |        |
| 005    | 0960_MW181_3.5-  | HDPE (no PTFE)                 | 20 mL  | 00350821023909 | Grey  | No       |        |
| 005    | 0960_MW181_3.5-  | HDPE (no PTFE)                 | 20 mL  | 00350821023767 | Grey  | No       |        |
| 005    | 0960_MW181_3.5-  | Clear Plastic Bottle - Natural | 500 mL | 00070621089845 | Green | No       |        |
| 006    | 0960_MW180_1-1.5 | Clear Plastic Bottle - Natural | 500 mL | 00070621089780 | Green | No       |        |
| 006    | 0960_MW180_1-1.5 | HDPE (no PTFE)                 | 20 mL  | 00350821023844 | Grey  | No       |        |
| 006    | 0960_MW180_1-1.5 | HDPE (no PTFE)                 | 20 mL  | 00350821043234 | Grey  | No       |        |
| 007    | 0960_MW135_2.5-3 | Clear Plastic Bottle - Natural | 500 mL | 00070621089626 | Green | No       |        |
| 007    | 0960_MW135_2.5-3 | HDPE (no PTFE)                 | 20 mL  | 00350821023919 | Grey  | No       |        |
| 007    | 0960_MW135_2.5-3 | HDPE (no PTFE)                 | 20 mL  | 00350821023814 | Grey  | No       |        |
| 008    | 0960_QC301       | HDPE (no PTFE)                 | 20 mL  | 00350019177392 | Grey  | No       |        |
| 008    | 0960_QC301       | HDPE (no PTFE)                 | 20 mL  | 00352005020636 | Grey  | No       |        |
| 009    | 0960_QC302       | HDPE (no PTFE)                 | 20 mL  | 00352010058934 | Grey  | No       |        |
| 009    | 0960_QC302       | HDPE (no PTFE)                 | 20 mL  | 00350019177415 | Grey  | No       |        |
| 010    | 0960_QC401       | HDPE (no PTFE)                 | 20 mL  | 00350019177346 | Grey  | No       |        |



# CHAIN OF CUSTODY

COC#: 39277

ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: Learmonth GW - MB

ORDER NO: pfas-omp Learmonth

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:

|     |            |                |       |                |      |    |  |
|-----|------------|----------------|-------|----------------|------|----|--|
| 010 | 0960_QC401 | HDPE (no PTFE) | 20 mL | 00350019177517 | Grey | No |  |
| 011 | 0960_QC402 | HDPE (no PTFE) | 20 mL | 00352010058961 | Grey | No |  |
| 011 | 0960_QC402 | HDPE (no PTFE) | 20 mL | 00352005020564 | Grey | No |  |

Total Bottle Count: ALS: 29, Non ALS: 0



**SAMPLE RECEIPT NOTIFICATION (SRN)****Work Order : EP2207810**

Client : **STANTEC AUSTRALIA PTY LTD**  
Contact : [REDACTED]  
Address : GROUND FLOOR 226 ADELAIDE  
TERRACE  
PERTH 6000

Laboratory : Environmental Division Perth  
Contact : [REDACTED]  
Address : 26 Rigali Way Wangara Western  
Australia Australia 6065

E-mail : [REDACTED]@stantec.com  
Telephone : ----  
Facsimile : ----

E-mail : [REDACTED]@alsglobal.com  
Telephone : +6138549 9609  
Facsimile : +61-8-9406 1399

Project : WA\_0960\_PFASOMP  
Order number : pfas-omp Learmonth  
C-O-C number : 39277  
Site : Learmonth GW - [REDACTED]  
Sampler : [REDACTED]

Page : 1 of 2  
Quote number : ES2022MWHAUS0002 (SY/139/19 B)  
QC Level : NEPM 2013 B3 & ALS QC Standard

**Dates**

Date Samples Received : 27-Jun-2022 11:40  
Client Requested Due : 07-Jul-2022  
Date

Issue Date : 28-Jun-2022  
Scheduled Reporting Date : **07-Jul-2022**

**Delivery Details**

Mode of Delivery : Carrier  
No. of coolers/boxes : 5  
Receipt Detail :

Security Seal : Not Available  
Temperature : 13.4 - Ice present  
No. of samples received / analysed : 11 / 11

**General Comments**

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

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.

### Summary of Sample(s) and Requested Analysis

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

| Laboratory sample ID | Sampling date / time | Sample ID               | WATER Ionic Ba | WATER PFAS - | WATER Major C | WATER Major A |
|----------------------|----------------------|-------------------------|----------------|--------------|---------------|---------------|
| EP2207810-001        | 23-Jun-2022 08:21    | 0960_MW134_230623       | ✓              | ✓            | ✓             | ✓             |
| EP2207810-002        | 23-Jun-2022 10:08    | 0960_MW141_1.5-2_230... | ✓              | ✓            | ✓             | ✓             |
| EP2207810-003        | 23-Jun-2022 11:21    | 0960_MW140_1.5-2_230... | ✓              | ✓            | ✓             | ✓             |
| EP2207810-004        | 23-Jun-2022 12:22    | 0960_MW147_3-3.5_230... | ✓              | ✓            | ✓             | ✓             |
| EP2207810-005        | 23-Jun-2022 12:25    | 0960_MW181_3.5-4_230... | ✓              | ✓            | ✓             | ✓             |
| EP2207810-006        | 23-Jun-2022 12:57    | 0960_MW180_1-1.5_230... | ✓              | ✓            | ✓             | ✓             |
| EP2207810-007        | 23-Jun-2022 13:59    | 0960_MW135_2.5-3_230... | ✓              | ✓            | ✓             | ✓             |
| EP2207810-008        | 23-Jun-2022 15:19    | 0960_QC301_230623       |                | ✓            |               |               |
| EP2207810-009        | 23-Jun-2022 15:18    | 0960_QC302_230623       |                | ✓            |               |               |
| EP2207810-010        | 23-Jun-2022 15:17    | 0960_QC401_230623       |                | ✓            |               |               |
| EP2207810-011        | 23-Jun-2022 15:17    | 0960_QC402_230623       |                | ✓            |               |               |

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

|                                                                |       |                              |
|----------------------------------------------------------------|-------|------------------------------|
| - A4 - AU Tax Invoice (INV)                                    | Email | [REDACTED]@cardno.com.au     |
| <b>DERP LAB REPORTS</b>                                        |       |                              |
| - EDI Format - ESDAT (ESDAT)                                   | Email | derp.labreports@esdat.com.au |
| - *AU Certificate of Analysis - NATA (COA)                     | Email | [REDACTED]@stantec.com       |
| - *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)    | Email | [REDACTED]@stantec.com       |
| - *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)            | Email | [REDACTED]@stantec.com       |
| - A4 - AU Sample Receipt Notification - Environmental HT (SRN) | Email | [REDACTED]@stantec.com       |
| - Chain of Custody (CoC) (COC)                                 | Email | [REDACTED]@stantec.com       |
| - EDI Format - ESDAT (ESDAT)                                   | Email | [REDACTED]@stantec.com       |
| - EDI Format - XTab (XTAB)                                     | Email | [REDACTED]@stantec.com       |

## CERTIFICATE OF ANALYSIS

**Work Order** : **EP2207810**  
**Client** : **STANTEC AUSTRALIA PTY LTD**  
**Contact** : [REDACTED]  
**Address** : GROUND FLOOR 226 ADELAIDE TERRACE  
 PERTH 6000  
**Telephone** : ----  
**Project** : WA\_0960\_PFASOMP  
**Order number** : pfas-omp Learmonth  
**C-O-C number** : 39277  
**Sampler** : [REDACTED]  
**Site** : Learmonth GW - [REDACTED]  
**Quote number** : SY/139/19 B  
**No. of samples received** : 11  
**No. of samples analysed** : 11

**Page** : 1 of 11  
**Laboratory** : Environmental Division Perth  
**Contact** : [REDACTED]  
**Address** : 26 Rigali Way Wangara Western Australia Australia 6065  
**Telephone** : +6138549 9609  
**Date Samples Received** : 27-Jun-2022 11:40  
**Date Analysis Commenced** : 29-Jun-2022  
**Issue Date** : 07-Jul-2022 15:30



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>                |
|------------------------------------------------------------------------|----------------------------|----------------------------------------------|
| <span style="background-color: black; color: black;">[REDACTED]</span> | Laboratory Manager (Perth) | Perth Inorganics, Wangara, Western Australia |
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator           | Sydney Organics, Smithfield, NSW             |



## 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.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- 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.
- ED041G (Sulfate - Turbidimetric): samples EP2207810-001, -003, & -004 were re-filtered and re-analyzed from parent sample to confirm results.
- ED045G (Chloride): samples EP2207810-001, -003, & -004 were re-filtered and re-analyzed from parent sample to confirm results.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                                   |             |      |       | 0960_MW134_230623 | 0960_MW141_1.5-2_2<br>30623 | 0960_MW140_1.5-2_2<br>30623 | 0960_MW147_3-3.5_2<br>30623 | 0960_MW181_3.5-4_2<br>30623 |
|-------------------------------------------------------------------|-------------|------|-------|-------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| Sampling date / time                                              |             |      |       | 23-Jun-2022 08:21 | 23-Jun-2022 10:08           | 23-Jun-2022 11:21           | 23-Jun-2022 12:22           | 23-Jun-2022 12:25           |
| Compound                                                          | CAS Number  | LOR  | Unit  | EP2207810-001     | EP2207810-002               | EP2207810-003               | EP2207810-004               | EP2207810-005               |
|                                                                   |             |      |       | Result            | Result                      | Result                      | Result                      | Result                      |
| <b>ED037P: Alkalinity by PC Titrator</b>                          |             |      |       |                   |                             |                             |                             |                             |
| Hydroxide Alkalinity as CaCO <sub>3</sub>                         | DMO-210-001 | 1    | mg/L  | <1                | <1                          | <1                          | <1                          | <1                          |
| Carbonate Alkalinity as CaCO <sub>3</sub>                         | 3812-32-6   | 1    | mg/L  | <1                | <1                          | <1                          | <1                          | <1                          |
| Bicarbonate Alkalinity as CaCO <sub>3</sub>                       | 71-52-3     | 1    | mg/L  | 168               | 337                         | 180                         | 164                         | 153                         |
| Total Alkalinity as CaCO <sub>3</sub>                             | ----        | 1    | mg/L  | 168               | 337                         | 180                         | 164                         | 153                         |
| <b>ED041G: Sulfate (Turbidimetric) as SO<sub>4</sub> 2- by DA</b> |             |      |       |                   |                             |                             |                             |                             |
| Sulfate as SO <sub>4</sub> - Turbidimetric                        | 14808-79-8  | 1    | mg/L  | 3450              | 2230                        | 5090                        | 5470                        | 4840                        |
| <b>ED045G: Chloride by Discrete Analyser</b>                      |             |      |       |                   |                             |                             |                             |                             |
| Chloride                                                          | 16887-00-6  | 1    | mg/L  | 23100             | 13400                       | 41300                       | 43400                       | 36500                       |
| <b>ED093F: Dissolved Major Cations</b>                            |             |      |       |                   |                             |                             |                             |                             |
| Calcium                                                           | 7440-70-2   | 1    | mg/L  | 594               | 307                         | 781                         | 909                         | 1030                        |
| Magnesium                                                         | 7439-95-4   | 1    | mg/L  | 1440              | 925                         | 2620                        | 2730                        | 2950                        |
| Sodium                                                            | 7440-23-5   | 1    | mg/L  | 12300             | 8180                        | 20100                       | 20500                       | 23300                       |
| Potassium                                                         | 7440-09-7   | 1    | mg/L  | 712               | 443                         | 1100                        | 1150                        | 1110                        |
| <b>EN055: Ionic Balance</b>                                       |             |      |       |                   |                             |                             |                             |                             |
| ∅ Total Anions                                                    | ----        | 0.01 | meq/L | 727               | 431                         | 1270                        | 1340                        | 1130                        |
| ∅ Total Cations                                                   | ----        | 0.01 | meq/L | 701               | 458                         | 1160                        | 1190                        | 1340                        |
| ∅ Ionic Balance                                                   | ----        | 0.01 | %     | 1.78              | 3.08                        | 4.83                        | 5.93                        | 8.20                        |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>                      |             |      |       |                   |                             |                             |                             |                             |
| 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                       |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>                    |             |      |       |                   |                             |                             |                             |                             |
| 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                       |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_MW134_230623 | 0960_MW141_1.5-2_2<br>30623 | 0960_MW140_1.5-2_2<br>30623 | 0960_MW147_3-3.5_2<br>30623 | 0960_MW181_3.5-4_2<br>30623 |
|------------------------------------------------------------|-------------|------|------|-------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| Sampling date / time                                       |             |      |      | 23-Jun-2022 08:21 | 23-Jun-2022 10:08           | 23-Jun-2022 11:21           | 23-Jun-2022 12:22           | 23-Jun-2022 12:25           |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2207810-001     | EP2207810-002               | EP2207810-003               | EP2207810-004               | EP2207810-005               |
|                                                            |             |      |      | Result            | Result                      | Result                      | Result                      | Result                      |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                   |                             |                             |                             |                             |
| 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 (PFTTrDA)                        | 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                       |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                   |                             |                             |                             |                             |
| Perfluorooctane sulfonamide (FOSA)                         | 754-91-6    | 0.02 | µg/L | <0.02             | <0.02                       | <0.02                       | <0.02                       | <0.02                       |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)              | 31506-32-8  | 0.05 | µg/L | <0.05             | <0.05                       | <0.05                       | <0.05                       | <0.05                       |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)               | 4151-50-2   | 0.05 | µg/L | <0.05             | <0.05                       | <0.05                       | <0.05                       | <0.05                       |
| N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)       | 24448-09-7  | 0.05 | µg/L | <0.05             | <0.05                       | <0.05                       | <0.05                       | <0.05                       |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)        | 1691-99-2   | 0.05 | µg/L | <0.05             | <0.05                       | <0.05                       | <0.05                       | <0.05                       |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)  | 2355-31-9   | 0.02 | µg/L | <0.02             | <0.02                       | <0.02                       | <0.02                       | <0.02                       |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)   | 2991-50-6   | 0.02 | µg/L | <0.02             | <0.02                       | <0.02                       | <0.02                       | <0.02                       |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                   |                             |                             |                             |                             |
| 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                       |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_MW134_230623 | 0960_MW141_1.5-2_2<br>30623 | 0960_MW140_1.5-2_2<br>30623 | 0960_MW147_3-3.5_2<br>30623 | 0960_MW181_3.5-4_2<br>30623 |
|---------------------------------------------------------------|--------------------|------|------|-------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| Sampling date / time                                          |                    |      |      | 23-Jun-2022 08:21 | 23-Jun-2022 10:08           | 23-Jun-2022 11:21           | 23-Jun-2022 12:22           | 23-Jun-2022 12:25           |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2207810-001     | EP2207810-002               | EP2207810-003               | EP2207810-004               | EP2207810-005               |
|                                                               |                    |      |      | Result            | Result                      | Result                      | Result                      | Result                      |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                   |                             |                             |                             |                             |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05             | <0.05                       | <0.05                       | <0.05                       | <0.05                       |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                   |                             |                             |                             |                             |
| 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                       |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                   |                             |                             |                             |                             |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 104               | 102                         | 102                         | 106                         | 114                         |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 86.9              | 85.0                        | 83.2                        | 86.9                        | 88.0                        |





## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                        |             |      |       | 0960_MW180_1-1.5_2<br>30623 | 0960_MW135_2.5-3_2<br>30623 | ----  | ----  | ----  |
|--------------------------------------------------------|-------------|------|-------|-----------------------------|-----------------------------|-------|-------|-------|
| Sampling date / time                                   |             |      |       | 23-Jun-2022 12:57           | 23-Jun-2022 13:59           | ----  | ----  | ----  |
| Compound                                               | CAS Number  | LOR  | Unit  | EP2207810-006               | EP2207810-007               | ----- | ----- | ----- |
| Result                                                 |             |      |       | Result                      | Result                      | ----  | ----  | ----  |
| <b>ED037P: Alkalinity by PC Titrator</b>               |             |      |       |                             |                             |       |       |       |
| Hydroxide Alkalinity as CaCO3                          | DMO-210-001 | 1    | mg/L  | <1                          | <1                          | ----  | ----  | ----  |
| Carbonate Alkalinity as CaCO3                          | 3812-32-6   | 1    | mg/L  | <1                          | <1                          | ----  | ----  | ----  |
| Bicarbonate Alkalinity as CaCO3                        | 71-52-3     | 1    | mg/L  | 230                         | 182                         | ----  | ----  | ----  |
| Total Alkalinity as CaCO3                              | ----        | 1    | mg/L  | 230                         | 182                         | ----  | ----  | ----  |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b> |             |      |       |                             |                             |       |       |       |
| Sulfate as SO4 - Turbidimetric                         | 14808-79-8  | 1    | mg/L  | 4290                        | 1690                        | ----  | ----  | ----  |
| <b>ED045G: Chloride by Discrete Analyser</b>           |             |      |       |                             |                             |       |       |       |
| Chloride                                               | 16887-00-6  | 1    | mg/L  | 32000                       | 11900                       | ----  | ----  | ----  |
| <b>ED093F: Dissolved Major Cations</b>                 |             |      |       |                             |                             |       |       |       |
| Calcium                                                | 7440-70-2   | 1    | mg/L  | 755                         | 369                         | ----  | ----  | ----  |
| Magnesium                                              | 7439-95-4   | 1    | mg/L  | 2500                        | 832                         | ----  | ----  | ----  |
| Sodium                                                 | 7440-23-5   | 1    | mg/L  | 19800                       | 6400                        | ----  | ----  | ----  |
| Potassium                                              | 7440-09-7   | 1    | mg/L  | 1230                        | 372                         | ----  | ----  | ----  |
| <b>EN055: Ionic Balance</b>                            |             |      |       |                             |                             |       |       |       |
| ∅ Total Anions                                         | ----        | 0.01 | meq/L | 996                         | 374                         | ----  | ----  | ----  |
| ∅ Total Cations                                        | ----        | 0.01 | meq/L | 1140                        | 375                         | ----  | ----  | ----  |
| ∅ Ionic Balance                                        | ----        | 0.01 | %     | 6.54                        | 0.04                        | ----  | ----  | ----  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>           |             |      |       |                             |                             |       |       |       |
| 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                       | ----  | ----  | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>         |             |      |       |                             |                             |       |       |       |
| 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                       | ----  | ----  | ----  |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_MW180_1-1.5_2<br>30623 | 0960_MW135_2.5-3_2<br>30623 | ----  | ----  | ----  |
|------------------------------------------------------------|-------------|------|------|-----------------------------|-----------------------------|-------|-------|-------|
| Sampling date / time                                       |             |      |      | 23-Jun-2022 12:57           | 23-Jun-2022 13:59           | ----  | ----  | ----  |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2207810-006               | EP2207810-007               | ----- | ----- | ----- |
|                                                            |             |      |      | Result                      | Result                      | ----  | ----  | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                             |                             |       |       |       |
| 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 (PFTTrDA)                        | 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                       | ----  | ----  | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                             |                             |       |       |       |
| 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                       | ----  | ----  | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                             |                             |       |       |       |
| 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                       | ----  | ----  | ----  |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_MW180_1-1.5_2<br>30623 | 0960_MW135_2.5-3_2<br>30623 | ----  | ----  | ----  |
|---------------------------------------------------------------|--------------------|------|------|-----------------------------|-----------------------------|-------|-------|-------|
| Sampling date / time                                          |                    |      |      | 23-Jun-2022 12:57           | 23-Jun-2022 13:59           | ----  | ----  | ----  |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2207810-006               | EP2207810-007               | ----- | ----- | ----- |
| Result                                                        |                    |      |      | Result                      | Result                      | ----  | ----  | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                             |                             |       |       |       |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05                       | <0.05                       | ----  | ----  | ----  |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                             |                             |       |       |       |
| 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                       | ----  | ----  | ----  |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                             |                             |       |       |       |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 108                         | 97.5                        | ----  | ----  | ----  |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 86.5                        | 88.4                        | ----  | ----  | ----  |



## Analytical Results

Sub-Matrix: RINSATE  
 (Matrix: WATER)

Sample ID

| Sub-Matrix: RINSATE<br>(Matrix: WATER)        |            |      |      | Sample ID         | 0960_QC301_230623 | 0960_QC302_230623 | 0960_QC401_230623 | 0960_QC402_230623 | ---- |
|-----------------------------------------------|------------|------|------|-------------------|-------------------|-------------------|-------------------|-------------------|------|
| Sampling date / time                          |            |      |      | 23-Jun-2022 15:19 | 23-Jun-2022 15:18 | 23-Jun-2022 15:17 | 23-Jun-2022 15:17 | ----              |      |
| Compound                                      | CAS Number | LOR  | Unit | EP2207810-008     | EP2207810-009     | EP2207810-010     | EP2207810-011     | -----             |      |
|                                               |            |      |      | Result            | Result            | Result            | Result            | ----              |      |
| EP231A: Perfluoroalkyl Sulfonic Acids         |            |      |      |                   |                   |                   |                   |                   |      |
| Perfluorobutane sulfonic acid (PFBS)          | 375-73-5   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | ----              |      |
| Perfluoropentane sulfonic acid (PFPeS)        | 2706-91-4  | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | ----              |      |
| Perfluorohexane sulfonic acid (PFHxS)         | 355-46-4   | 0.01 | µg/L | <0.01             | <0.01             | <0.01             | <0.01             | ----              |      |
| Perfluoroheptane sulfonic acid (PFHpS)        | 375-92-8   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | ----              |      |
| Perfluorooctane sulfonic acid (PFOS)          | 1763-23-1  | 0.01 | µg/L | <0.01             | <0.01             | <0.01             | <0.01             | ----              |      |
| Perfluorodecane sulfonic acid (PFDS)          | 335-77-3   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | ----              |      |
| EP231B: Perfluoroalkyl Carboxylic Acids       |            |      |      |                   |                   |                   |                   |                   |      |
| Perfluorobutanoic acid (PFBA)                 | 375-22-4   | 0.1  | µg/L | <0.1              | <0.1              | <0.1              | <0.1              | ----              |      |
| Perfluoropentanoic acid (PFPeA)               | 2706-90-3  | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | ----              |      |
| Perfluorohexanoic acid (PFHxA)                | 307-24-4   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | ----              |      |
| Perfluoroheptanoic acid (PFHpA)               | 375-85-9   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | ----              |      |
| Perfluorooctanoic acid (PFOA)                 | 335-67-1   | 0.01 | µg/L | <0.01             | <0.01             | <0.01             | <0.01             | ----              |      |
| Perfluorononanoic acid (PFNA)                 | 375-95-1   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | ----              |      |
| Perfluorodecanoic acid (PFDA)                 | 335-76-2   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | ----              |      |
| Perfluoroundecanoic acid (PFUnDA)             | 2058-94-8  | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | ----              |      |
| Perfluorododecanoic acid (PFDoDA)             | 307-55-1   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | ----              |      |
| Perfluorotridecanoic acid (PFTrDA)            | 72629-94-8 | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | ----              |      |
| Perfluorotetradecanoic acid (PFTeDA)          | 376-06-7   | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | ----              |      |
| EP231C: Perfluoroalkyl Sulfonamides           |            |      |      |                   |                   |                   |                   |                   |      |
| Perfluorooctane sulfonamide (FOSA)            | 754-91-6   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | ----              |      |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | 31506-32-8 | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | ----              |      |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)  | 4151-50-2  | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | ----              |      |



## Analytical Results

Sub-Matrix: RINSATE  
 (Matrix: WATER)

Sample ID

|                                                           |                    |      |      | 0960_QC301_230623 | 0960_QC302_230623 | 0960_QC401_230623 | 0960_QC402_230623 | ----  |
|-----------------------------------------------------------|--------------------|------|------|-------------------|-------------------|-------------------|-------------------|-------|
| Sampling date / time                                      |                    |      |      | 23-Jun-2022 15:19 | 23-Jun-2022 15:18 | 23-Jun-2022 15:17 | 23-Jun-2022 15:17 | ----  |
| Compound                                                  | CAS Number         | LOR  | Unit | EP2207810-008     | EP2207810-009     | EP2207810-010     | EP2207810-011     | ----- |
|                                                           |                    |      |      | Result            | Result            | Result            | Result            | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides - Continued</b>    |                    |      |      |                   |                   |                   |                   |       |
| 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             | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>         |                    |      |      |                   |                   |                   |                   |       |
| 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             | ----  |
| <b>EP231P: PFAS Sums</b>                                  |                    |      |      |                   |                   |                   |                   |       |
| Sum of PFAS                                               | ----               | 0.01 | µg/L | <0.01             | <0.01             | <0.01             | <0.01             | ----  |
| Sum of PFHxS and PFOS                                     | 355-46-4/1763-23-1 | 0.01 | µg/L | <0.01             | <0.01             | <0.01             | <0.01             | ----  |
| Sum of PFAS (WA DER List)                                 | ----               | 0.01 | µg/L | <0.01             | <0.01             | <0.01             | <0.01             | ----  |
| <b>EP231S: PFAS Surrogate</b>                             |                    |      |      |                   |                   |                   |                   |       |
| 13C4-PFOS                                                 | ----               | 0.02 | %    | 104               | 102               | 97.9              | 97.2              | ----  |
| 13C8-PFOA                                                 | ----               | 0.02 | %    | 102               | 102               | 100               | 100               | ----  |



### Surrogate Control Limits

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

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

### Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (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              | : EP2207810                                       | Page                    | : 1 of 7                                                 |
| Client                  | : STANTEC AUSTRALIA PTY LTD                       | Laboratory              | : Environmental Division Perth                           |
| Contact                 | : [REDACTED]                                      | Contact                 | : [REDACTED]                                             |
| Address                 | : GROUND FLOOR 226 ADELAIDE TERRACE<br>PERTH 6000 | Address                 | : 26 Rigali Way Wangara Western Australia Australia 6065 |
| Telephone               | : ----                                            | Telephone               | : +6138549 9609                                          |
| Project                 | : WA_0960_PFASOMP                                 | Date Samples Received   | : 27-Jun-2022                                            |
| Order number            | : pfas-omp Learmonth                              | Date Analysis Commenced | : 29-Jun-2022                                            |
| C-O-C number            | : 39277                                           | Issue Date              | : 07-Jul-2022                                            |
| Sampler                 | : [REDACTED]                                      |                         |                                                          |
| Site                    | : Learmonth GW - [REDACTED]                       |                         |                                                          |
| Quote number            | : SY/139/19 B                                     |                         |                                                          |
| No. of samples received | : 11                                              |                         |                                                          |
| No. of samples analysed | : 11                                              |                         |                                                          |



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

This Quality Control Report contains the following information:

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

### Signatories

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

| Signatories | Position                   | Accreditation Category                       |
|-------------|----------------------------|----------------------------------------------|
| [REDACTED]  | Laboratory Manager (Perth) | Perth Inorganics, Wangara, Western Australia |
| [REDACTED]  | LCMS Coordinator           | Sydney Organics, Smithfield, NSW             |





## 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**

| Sub-Matrix: WATER                                                 |                         |                                          |             | Laboratory Duplicate (DUP) Report |      |                 |                  |         |                    |
|-------------------------------------------------------------------|-------------------------|------------------------------------------|-------------|-----------------------------------|------|-----------------|------------------|---------|--------------------|
| Laboratory sample ID                                              | Sample ID               | Method: Compound                         | CAS Number  | LOR                               | Unit | Original Result | Duplicate Result | RPD (%) | Acceptable RPD (%) |
| ED037P: Alkalinity by PC Titrator (QC Lot: 4442811)               |                         |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207632-002                                                     | Anonymous               | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                         | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                         | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 40              | 41               | 2.6     | 0% - 20%           |
|                                                                   |                         | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 40              | 41               | 2.6     | 0% - 20%           |
| EP2207810-003                                                     | 0960_MW140_1.5-2_230623 | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                         | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                         | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 180             | 174              | 3.4     | 0% - 20%           |
|                                                                   |                         | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 180             | 174              | 3.4     | 0% - 20%           |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4429739) |                         |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207727-001                                                     | Anonymous               | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 592             | 594              | 0.4     | 0% - 20%           |
| EP2207727-011                                                     | Anonymous               | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 1570            | 1570             | 0.4     | 0% - 20%           |
| ED045G: Chloride by Discrete Analyser (QC Lot: 4429738)           |                         |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207727-001                                                     | Anonymous               | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 4640            | 4660             | 0.4     | 0% - 20%           |
| EP2207727-011                                                     | Anonymous               | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 14100           | 14200            | 0.5     | 0% - 20%           |
| ED093F: Dissolved Major Cations (QC Lot: 4428392)                 |                         |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207731-001                                                     | Anonymous               | ED093F: Calcium                          | 7440-70-2   | 1                                 | mg/L | 1130            | 1020             | 11.1    | 0% - 20%           |
|                                                                   |                         | ED093F: Magnesium                        | 7439-95-4   | 1                                 | mg/L | 1860            | 1680             | 10.2    | 0% - 20%           |
|                                                                   |                         | ED093F: Sodium                           | 7440-23-5   | 1                                 | mg/L | 15400           | 13800            | 10.3    | 0% - 20%           |
|                                                                   |                         | ED093F: Potassium                        | 7440-09-7   | 1                                 | mg/L | 620             | 554              | 11.2    | 0% - 20%           |
| EP2207731-011                                                     | Anonymous               | ED093F: Calcium                          | 7440-70-2   | 1                                 | mg/L | 1100            | 1060             | 3.4     | 0% - 20%           |
|                                                                   |                         | ED093F: Magnesium                        | 7439-95-4   | 1                                 | mg/L | 2940            | 2880             | 2.2     | 0% - 20%           |
|                                                                   |                         | ED093F: Sodium                           | 7440-23-5   | 1                                 | mg/L | 23400           | 22900            | 2.5     | 0% - 20%           |

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 Work Order : EP2207810  
 Client : STANTEC AUSTRALIA PTY LTD  
 Project : WA\_0960\_PFASOMP



| Sub-Matrix: WATER                                             |                         |                                                                   |            | Laboratory Duplicate (DUP) Report |      |                 |                  |         |                    |
|---------------------------------------------------------------|-------------------------|-------------------------------------------------------------------|------------|-----------------------------------|------|-----------------|------------------|---------|--------------------|
| Laboratory sample ID                                          | Sample ID               | Method: Compound                                                  | CAS Number | LOR                               | Unit | Original Result | Duplicate Result | RPD (%) | Acceptable RPD (%) |
| ED093F: Dissolved Major Cations (QC Lot: 4428392) - continued |                         |                                                                   |            |                                   |      |                 |                  |         |                    |
| EP2207731-011                                                 | Anonymous               | ED093F: Potassium                                                 | 7440-09-7  | 1                                 | mg/L | 1120            | 1110             | 0.7     | 0% - 20%           |
| ED093F: Dissolved Major Cations (QC Lot: 4428393)             |                         |                                                                   |            |                                   |      |                 |                  |         |                    |
| EP2207810-004                                                 | 0960_MW147_3-3.5_230623 | ED093F: Calcium                                                   | 7440-70-2  | 1                                 | mg/L | 909             | 903              | 0.7     | 0% - 20%           |
|                                                               |                         | ED093F: Magnesium                                                 | 7439-95-4  | 1                                 | mg/L | 2730            | 2760             | 0.9     | 0% - 20%           |
|                                                               |                         | ED093F: Sodium                                                    | 7440-23-5  | 1                                 | mg/L | 20500           | 20700            | 0.9     | 0% - 20%           |
|                                                               |                         | ED093F: Potassium                                                 | 7440-09-7  | 1                                 | mg/L | 1150            | 1150             | 0.0     | 0% - 20%           |
| EP2207812-007                                                 | Anonymous               | ED093F: Calcium                                                   | 7440-70-2  | 1                                 | mg/L | 531             | 603              | 12.7    | 0% - 20%           |
|                                                               |                         | ED093F: Magnesium                                                 | 7439-95-4  | 1                                 | mg/L | 1810            | 2040             | 12.0    | 0% - 20%           |
|                                                               |                         | ED093F: Sodium                                                    | 7440-23-5  | 1                                 | mg/L | 13500           | 15300            | 12.5    | 0% - 20%           |
|                                                               |                         | ED093F: Potassium                                                 | 7440-09-7  | 1                                 | mg/L | 719             | 840              | 15.5    | 0% - 20%           |
| EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4438110)       |                         |                                                                   |            |                                   |      |                 |                  |         |                    |
| EP2207634-002                                                 | Anonymous               | EP231X: Perfluorohexane sulfonic acid (PFHxS)                     | 355-46-4   | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
|                                                               |                         | EP231X: Perfluorooctane sulfonic acid (PFOS)                      | 1763-23-1  | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
|                                                               |                         | EP231X: Perfluorobutane sulfonic acid (PFBS)                      | 375-73-5   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                               |                         | EP231X: Perfluoropentane sulfonic acid (PFPeS)                    | 2706-91-4  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                               |                         | EP231X: Perfluoroheptane sulfonic acid (PFHpS)                    | 375-92-8   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                               |                         | EP231X: Perfluorodecane sulfonic acid (PFDS)                      | 335-77-3   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
| EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4438110)     |                         |                                                                   |            |                                   |      |                 |                  |         |                    |
| EP2207634-002                                                 | Anonymous               | EP231X: Perfluorooctanoic acid (PFOA)                             | 335-67-1   | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
|                                                               |                         | EP231X: Perfluoropentanoic acid (PFPeA)                           | 2706-90-3  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                               |                         | EP231X: Perfluorohexanoic acid (PFHxA)                            | 307-24-4   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                               |                         | EP231X: Perfluoroheptanoic acid (PFHpA)                           | 375-85-9   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                               |                         | EP231X: Perfluorononanoic acid (PFNA)                             | 375-95-1   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                               |                         | EP231X: Perfluorodecanoic acid (PFDA)                             | 335-76-2   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                               |                         | EP231X: Perfluoroundecanoic acid (PFUnDA)                         | 2058-94-8  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                               |                         | EP231X: Perfluorododecanoic acid (PFDoDA)                         | 307-55-1   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                               |                         | EP231X: Perfluorotridecanoic acid (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: 4438110)         |                         |                                                                   |            |                                   |      |                 |                  |         |                    |
| EP2207634-002                                                 | Anonymous               | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                               |                         | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                               |                         | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                               |                         | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8 | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                               |                         | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |

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 Work Order : EP2207810  
 Client : STANTEC AUSTRALIA PTY LTD  
 Project : WA\_0960\_PFASOMP



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 (%) |
| EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4438110) - continued |           |                                                              |             |                                   |      |                 |                  |         |                    |
| EP2207634-002                                                     | 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: 4438110)      |           |                                                              |             |                                   |      |                 |                  |         |                    |
| EP2207634-002                                                     | Anonymous | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)            | 757124-72-4 | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |           | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)            | 27619-97-2  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |           | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)            | 39108-34-4  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |           | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)          | 120226-60-0 | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
| EP231P: PFAS Sums (QC Lot: 4438110)                               |           |                                                              |             |                                   |      |                 |                  |         |                    |
| EP2207634-002                                                     | Anonymous | EP231X: Sum of PFAS                                          | ----        | 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**

| Sub-Matrix: WATER                                                |             |      |      | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |      |
|------------------------------------------------------------------|-------------|------|------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|------|
|                                                                  |             |      |      |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |      |
| Method: Compound                                                 | CAS Number  | LOR  | Unit | Result                      |                                       |                           |                                   |      |
| ED037P: Alkalinity by PC Titrator (QCLot: 4442811)               |             |      |      |                             |                                       |                           |                                   |      |
| ED037-P: Hydroxide Alkalinity as CaCO3                           | DMO-210-001 | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Carbonate Alkalinity as CaCO3                           | 3812-32-6   | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Bicarbonate Alkalinity as CaCO3                         | 71-52-3     | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Total Alkalinity as CaCO3                               | ----        | 1    | mg/L | <1                          | 20 mg/L                               | 103                       | 87.8                              | 118  |
|                                                                  |             |      |      | <1                          | 200 mg/L                              | 96.8                      | 87.8                              | 118  |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4429739) |             |      |      |                             |                                       |                           |                                   |      |
| ED041G: Sulfate as SO4 - Turbidimetric                           | 14808-79-8  | 1    | mg/L | <1                          | 25 mg/L                               | 93.3                      | 89.9                              | 112  |
|                                                                  |             |      |      | <1                          | 500 mg/L                              | 96.1                      | 89.9                              | 112  |
| ED045G: Chloride by Discrete Analyser (QCLot: 4429738)           |             |      |      |                             |                                       |                           |                                   |      |
| ED045G: Chloride                                                 | 16887-00-6  | 1    | mg/L | <1                          | 10 mg/L                               | 97.2                      | 88.6                              | 113  |
|                                                                  |             |      |      | <1                          | 1000 mg/L                             | 96.8                      | 88.6                              | 113  |
| ED093F: Dissolved Major Cations (QCLot: 4428392)                 |             |      |      |                             |                                       |                           |                                   |      |
| ED093F: Calcium                                                  | 7440-70-2   | 1    | mg/L | <1                          | 50 mg/L                               | 97.2                      | 86.5                              | 117  |
| ED093F: Magnesium                                                | 7439-95-4   | 1    | mg/L | <1                          | 50 mg/L                               | 99.1                      | 88.4                              | 110  |
| ED093F: Sodium                                                   | 7440-23-5   | 1    | mg/L | <1                          | 50 mg/L                               | 109                       | 91.4                              | 113  |
| ED093F: Potassium                                                | 7440-09-7   | 1    | mg/L | <1                          | 50 mg/L                               | 93.9                      | 84.6                              | 108  |
| ED093F: Dissolved Major Cations (QCLot: 4428393)                 |             |      |      |                             |                                       |                           |                                   |      |
| ED093F: Calcium                                                  | 7440-70-2   | 1    | mg/L | <1                          | 50 mg/L                               | 108                       | 86.5                              | 117  |
| ED093F: Magnesium                                                | 7439-95-4   | 1    | mg/L | <1                          | 50 mg/L                               | 108                       | 88.4                              | 110  |
| ED093F: Sodium                                                   | 7440-23-5   | 1    | mg/L | <1                          | 50 mg/L                               | 113                       | 91.4                              | 113  |
| ED093F: Potassium                                                | 7440-09-7   | 1    | mg/L | <1                          | 50 mg/L                               | 99.5                      | 84.6                              | 108  |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4438110)           |             |      |      |                             |                                       |                           |                                   |      |
| EP231X: Perfluorobutane sulfonic acid (PFBS)                     | 375-73-5    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 111                       | 72.0                              | 130  |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)                   | 2706-91-4   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 109                       | 71.0                              | 127  |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)                    | 355-46-4    | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 103                       | 68.0                              | 131  |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)                   | 375-92-8    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 104                       | 69.0                              | 134  |
| EP231X: Perfluorooctane sulfonic acid (PFOS)                     | 1763-23-1   | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 99.2                      | 65.0                              | 140  |
| EP231X: Perfluorodecane sulfonic acid (PFDS)                     | 335-77-3    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 94.0                      | 53.0                              | 142  |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4438734)           |             |      |      |                             |                                       |                           |                                   |      |
| EP231X: Perfluorobutane sulfonic acid (PFBS)                     | 375-73-5    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 116                       | 72.0                              | 130  |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)                   | 2706-91-4   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 114                       | 71.0                              | 127  |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)                    | 355-46-4    | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 110                       | 68.0                              | 131  |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)                   | 375-92-8    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 120                       | 69.0                              | 134  |



Sub-Matrix: **WATER**

| Sub-Matrix: WATER                                                  |            |      |      | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |     |
|--------------------------------------------------------------------|------------|------|------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|-----|
|                                                                    |            |      |      |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |     |
| Method: Compound                                                   | CAS Number | LOR  | Unit | Result                      |                                       |                           |                                   |     |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4438734) - continued |            |      |      |                             |                                       |                           |                                   |     |
| EP231X: Perfluorooctane sulfonic acid (PFOS)                       | 1763-23-1  | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 108                       | 65.0                              | 140 |
| EP231X: Perfluorodecane sulfonic acid (PFDS)                       | 335-77-3   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 111                       | 53.0                              | 142 |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4438110)           |            |      |      |                             |                                       |                           |                                   |     |
| EP231X: Perfluorobutanoic acid (PFBA)                              | 375-22-4   | 0.1  | µg/L | <0.1                        | 1.25 µg/L                             | 103                       | 73.0                              | 129 |
| EP231X: Perfluoropentanoic acid (PFPeA)                            | 2706-90-3  | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 108                       | 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                             | 108                       | 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                             | 121                       | 69.0                              | 130 |
| EP231X: Perfluorodecanoic acid (PFDA)                              | 335-76-2   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 114                       | 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                             | 97.0                      | 72.0                              | 134 |
| EP231X: Perfluorotridecanoic acid (PFTrDA)                         | 72629-94-8 | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 95.0                      | 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: 4438734)           |            |      |      |                             |                                       |                           |                                   |     |
| 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                             | 122                       | 72.0                              | 129 |
| EP231X: Perfluorohexanoic acid (PFHxA)                             | 307-24-4   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 123                       | 72.0                              | 129 |
| EP231X: Perfluoroheptanoic acid (PFHpA)                            | 375-85-9   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 120                       | 72.0                              | 130 |
| EP231X: Perfluorooctanoic acid (PFOA)                              | 335-67-1   | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 117                       | 71.0                              | 133 |
| EP231X: Perfluorononanoic acid (PFNA)                              | 375-95-1   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 123                       | 69.0                              | 130 |
| EP231X: Perfluorodecanoic acid (PFDA)                              | 335-76-2   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 113                       | 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                             | 120                       | 65.0                              | 144 |
| EP231X: Perfluorotetradecanoic acid (PFTeDA)                       | 376-06-7   | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 116                       | 71.0                              | 132 |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4438110)               |            |      |      |                             |                                       |                           |                                   |     |
| 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                            | 101                       | 68.0                              | 141 |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)               | 4151-50-2  | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 90.0                      | 62.6                              | 147 |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)       | 24448-09-7 | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 101                       | 66.0                              | 145 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)        | 1691-99-2  | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 97.4                      | 57.6                              | 145 |
| EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)  | 2355-31-9  | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 119                       | 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 |



Sub-Matrix: **WATER**

| Method: Compound                                                   |             |      |        | Method Blank (MB) Report | Laboratory Control Spike (LCS) Report |                    |                       |      |
|--------------------------------------------------------------------|-------------|------|--------|--------------------------|---------------------------------------|--------------------|-----------------------|------|
|                                                                    |             |      |        |                          | Spike Concentration                   | Spike Recovery (%) | Acceptable Limits (%) |      |
|                                                                    |             |      |        |                          |                                       | LCS                | Low                   | High |
| CAS Number                                                         | LOR         | Unit | Result |                          |                                       |                    |                       |      |
| <b>EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4438734)</b>        |             |      |        |                          |                                       |                    |                       |      |
| EP231X: Perfluorooctane sulfonamide (FOSA)                         | 754-91-6    | 0.02 | µg/L   | <0.02                    | 0.25 µg/L                             | 119                | 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                            | 129                | 62.6                  | 147  |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)       | 24448-09-7  | 0.05 | µg/L   | <0.05                    | 0.625 µg/L                            | 118                | 66.0                  | 145  |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)        | 1691-99-2   | 0.05 | µg/L   | <0.05                    | 0.625 µg/L                            | 121                | 57.6                  | 145  |
| 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                             | 117                | 61.0                  | 135  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4438110)</b> |             |      |        |                          |                                       |                    |                       |      |
| EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                  | 757124-72-4 | 0.05 | µg/L   | <0.05                    | 0.25 µg/L                             | 105                | 63.0                  | 143  |
| EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                  | 27619-97-2  | 0.05 | µg/L   | <0.05                    | 0.25 µg/L                             | 111                | 64.0                  | 140  |
| EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                  | 39108-34-4  | 0.05 | µg/L   | <0.05                    | 0.25 µg/L                             | 118                | 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                             | 110                | 71.4                  | 144  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4438734)</b> |             |      |        |                          |                                       |                    |                       |      |
| EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                  | 757124-72-4 | 0.05 | µg/L   | <0.05                    | 0.25 µg/L                             | 117                | 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                             | 125                | 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                             | 122                | 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                             | 113                | 71.4                  | 144  |

## Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

| Laboratory sample ID                                                    |                  |                                        |            | Matrix Spike (MS) Report |                  |                       |      |
|-------------------------------------------------------------------------|------------------|----------------------------------------|------------|--------------------------|------------------|-----------------------|------|
|                                                                         |                  |                                        |            | Spike Concentration      | SpikeRecovery(%) | Acceptable Limits (%) |      |
|                                                                         |                  |                                        |            |                          | MS               | Low                   | High |
| Sample ID                                                               | Method: Compound | CAS Number                             |            |                          |                  |                       |      |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4429739)</b> |                  |                                        |            |                          |                  |                       |      |
| EP2207727-001                                                           | Anonymous        | ED041G: Sulfate as SO4 - Turbidimetric | 14808-79-8 | 100 mg/L                 | # Not Determined | 70.4                  | 130  |
| <b>ED045G: Chloride by Discrete Analyser (QCLot: 4429738)</b>           |                  |                                        |            |                          |                  |                       |      |
| EP2207727-001                                                           | Anonymous        | ED045G: Chloride                       | 16887-00-6 | 1000 mg/L                | # Not Determined | 70.0                  | 130  |

## QA/QC Compliance Assessment to assist with Quality Review

|              |                             |                         |                                |
|--------------|-----------------------------|-------------------------|--------------------------------|
| Work Order   | : EP2207810                 | Page                    | : 1 of 6                       |
| Client       | : STANTEC AUSTRALIA PTY LTD | Laboratory              | : Environmental Division Perth |
| Contact      | : [REDACTED]                | Telephone               | : +6138549 9609                |
| Project      | : WA_0960_PFASOMP           | Date Samples Received   | : 27-Jun-2022                  |
| Site         | : Learmonth GW - [REDACTED] | Issue Date              | : 07-Jul-2022                  |
| Sampler      | : [REDACTED]                | No. of samples received | : 11                           |
| Order number | : pfas-omp Learmonth        | No. of samples analysed | : 11                           |

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

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

### Summary of Outliers

#### Outliers : Quality Control Samples

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

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

#### Outliers : Analysis Holding Time Compliance

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

#### Outliers : Frequency of Quality Control Samples

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



*Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes*

| Compound Group Name                             | Laboratory Sample ID | Client Sample ID | Analyte                               | CAS Number | Data           | Limits | Comment                                                                                      |
|-------------------------------------------------|----------------------|------------------|---------------------------------------|------------|----------------|--------|----------------------------------------------------------------------------------------------|
| <b>Matrix Spike (MS) Recoveries</b>             |                      |                  |                                       |            |                |        |                                                                                              |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA | EP2207727--001       | Anonymous        | <b>Sulfate as SO4 - Turbidimetric</b> | 14808-79-8 | Not Determined | ----   | <b>MS recovery not determined, background level greater than or equal to 4x spike level.</b> |
| ED045G: Chloride by Discrete Analyser           | EP2207727--001       | Anonymous        | <b>Chloride</b>                       | 16887-00-6 | Not Determined | ----   | <b>MS recovery not determined, background level greater than or equal to 4x spike level.</b> |

| Quality Control Sample Type                          | Count |         | Rate (%) |          | Quality Control Specification  |
|------------------------------------------------------|-------|---------|----------|----------|--------------------------------|
| Method                                               | QC    | Regular | Actual   | Expected |                                |
| <b>Laboratory Duplicates (DUP)</b>                   |       |         |          |          |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | 1     | 36      | 2.78     | 10.00    | NEPM 2013 B3 & ALS QC Standard |
| <b>Matrix Spikes (MS)</b>                            |       |         |          |          |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | 0     | 36      | 0.00     | 5.00     | NEPM 2013 B3 & ALS QC Standard |

Evaluation: ✖ = Holding time breach : ✔ = Within holding time

| Method                                                 | Sample Date              | Extraction / Preparation |                    |            | Analysis      |                  |             |
|--------------------------------------------------------|--------------------------|--------------------------|--------------------|------------|---------------|------------------|-------------|
| Container / Client Sample ID(s)                        |                          | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation  |
| <b>ED037P: Alkalinity by PC Titrator</b>               |                          |                          |                    |            |               |                  |             |
| <b>Clear Plastic Bottle - Natural (ED037-P)</b>        |                          |                          |                    |            |               |                  |             |
| 0960_MW134_230623,                                     | 0960_MW141_1.5-2_230623, | 23-Jun-2022              | ----               | ----       | ----          | 06-Jul-2022      | 07-Jul-2022 |
| 0960_MW140_1.5-2_230623,                               | 0960_MW147_3-3.5_230623, |                          |                    |            |               |                  | ✓           |
| 0960_MW181_3.5-4_230623,                               | 0960_MW180_1-1.5_230623, |                          |                    |            |               |                  |             |
| 0960_MW135_2.5-3_230623                                |                          |                          |                    |            |               |                  |             |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b> |                          |                          |                    |            |               |                  |             |
| <b>Clear Plastic Bottle - Natural (ED041G)</b>         |                          |                          |                    |            |               |                  |             |
| 0960_MW134_230623,                                     | 0960_MW141_1.5-2_230623, | 23-Jun-2022              | ----               | ----       | ----          | 05-Jul-2022      | 21-Jul-2022 |
| 0960_MW140_1.5-2_230623,                               | 0960_MW147_3-3.5_230623, |                          |                    |            |               |                  | ✓           |
| 0960_MW181_3.5-4_230623,                               | 0960_MW180_1-1.5_230623, |                          |                    |            |               |                  |             |
| 0960_MW135_2.5-3_230623                                |                          |                          |                    |            |               |                  |             |



Matrix: **WATER**

Evaluation: \* = Holding time breach ; ✓ = Within holding time.

| Method                                  |                          | Sample Date | Extraction / Preparation |                    |            |  | Analysis      |                  |            |
|-----------------------------------------|--------------------------|-------------|--------------------------|--------------------|------------|--|---------------|------------------|------------|
| Container / Client Sample ID(s)         |                          |             | Date extracted           | Due for extraction | Evaluation |  | Date analysed | Due for analysis | Evaluation |
| ED045G: Chloride by Discrete Analyser   |                          |             |                          |                    |            |  |               |                  |            |
| Clear Plastic Bottle - Natural (ED045G) |                          |             |                          |                    |            |  |               |                  |            |
| 0960_MW134_230623,                      | 0960_MW141_1.5-2_230623, | 23-Jun-2022 | ----                     | ----               | ----       |  | 05-Jul-2022   | 21-Jul-2022      | ✓          |
| 0960_MW140_1.5-2_230623,                | 0960_MW147_3-3.5_230623, |             |                          |                    |            |  |               |                  |            |
| 0960_MW181_3.5-4_230623,                | 0960_MW180_1-1.5_230623, |             |                          |                    |            |  |               |                  |            |
| 0960_MW135_2.5-3_230623                 |                          |             |                          |                    |            |  |               |                  |            |
| ED093F: Dissolved Major Cations         |                          |             |                          |                    |            |  |               |                  |            |
| Clear Plastic Bottle - Natural (ED093F) |                          |             |                          |                    |            |  |               |                  |            |
| 0960_MW134_230623,                      | 0960_MW141_1.5-2_230623, | 23-Jun-2022 | ----                     | ----               | ----       |  | 29-Jun-2022   | 30-Jun-2022      | ✓          |
| 0960_MW140_1.5-2_230623,                | 0960_MW147_3-3.5_230623, |             |                          |                    |            |  |               |                  |            |
| 0960_MW181_3.5-4_230623,                | 0960_MW180_1-1.5_230623, |             |                          |                    |            |  |               |                  |            |
| 0960_MW135_2.5-3_230623                 |                          |             |                          |                    |            |  |               |                  |            |
| EP231A: Perfluoroalkyl Sulfonic Acids   |                          |             |                          |                    |            |  |               |                  |            |
| HDPE (no PTFE) (EP231X)                 |                          |             |                          |                    |            |  |               |                  |            |
| 0960_MW134_230623,                      | 0960_MW141_1.5-2_230623, | 23-Jun-2022 | 05-Jul-2022              | 20-Dec-2022        | ✓          |  | 05-Jul-2022   | 20-Dec-2022      | ✓          |
| 0960_MW140_1.5-2_230623,                | 0960_MW147_3-3.5_230623, |             |                          |                    |            |  |               |                  |            |
| 0960_MW181_3.5-4_230623,                | 0960_MW180_1-1.5_230623, |             |                          |                    |            |  |               |                  |            |
| 0960_MW135_2.5-3_230623,                | 0960_QC301_230623,       |             |                          |                    |            |  |               |                  |            |
| 0960_QC302_230623,                      | 0960_QC401_230623,       |             |                          |                    |            |  |               |                  |            |
| 0960_QC402_230623                       |                          |             |                          |                    |            |  |               |                  |            |
| EP231B: Perfluoroalkyl Carboxylic Acids |                          |             |                          |                    |            |  |               |                  |            |
| HDPE (no PTFE) (EP231X)                 |                          |             |                          |                    |            |  |               |                  |            |
| 0960_MW134_230623,                      | 0960_MW141_1.5-2_230623, | 23-Jun-2022 | 05-Jul-2022              | 20-Dec-2022        | ✓          |  | 05-Jul-2022   | 20-Dec-2022      | ✓          |
| 0960_MW140_1.5-2_230623,                | 0960_MW147_3-3.5_230623, |             |                          |                    |            |  |               |                  |            |
| 0960_MW181_3.5-4_230623,                | 0960_MW180_1-1.5_230623, |             |                          |                    |            |  |               |                  |            |
| 0960_MW135_2.5-3_230623,                | 0960_QC301_230623,       |             |                          |                    |            |  |               |                  |            |
| 0960_QC302_230623,                      | 0960_QC401_230623,       |             |                          |                    |            |  |               |                  |            |
| 0960_QC402_230623                       |                          |             |                          |                    |            |  |               |                  |            |
| EP231C: Perfluoroalkyl Sulfonamides     |                          |             |                          |                    |            |  |               |                  |            |
| HDPE (no PTFE) (EP231X)                 |                          |             |                          |                    |            |  |               |                  |            |
| 0960_MW134_230623,                      | 0960_MW141_1.5-2_230623, | 23-Jun-2022 | 05-Jul-2022              | 20-Dec-2022        | ✓          |  | 05-Jul-2022   | 20-Dec-2022      | ✓          |
| 0960_MW140_1.5-2_230623,                | 0960_MW147_3-3.5_230623, |             |                          |                    |            |  |               |                  |            |
| 0960_MW181_3.5-4_230623,                | 0960_MW180_1-1.5_230623, |             |                          |                    |            |  |               |                  |            |
| 0960_MW135_2.5-3_230623,                | 0960_QC301_230623,       |             |                          |                    |            |  |               |                  |            |
| 0960_QC302_230623,                      | 0960_QC401_230623,       |             |                          |                    |            |  |               |                  |            |
| 0960_QC402_230623                       |                          |             |                          |                    |            |  |               |                  |            |

Page : 4 of 6  
 Work Order : EP2207810  
 Client : STANTEC AUSTRALIA PTY LTD  
 Project : WA\_0960\_PFASOMP



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                                                                                                                            |                                                                                                                              | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |
|---------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|
| Container / Client Sample ID(s)                                                                                                                   |                                                                                                                              |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids                                                                                                        |                                                                                                                              |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                                                                                                                           |                                                                                                                              |             |                          |                    |            |               |                  |            |
| 0960_MW134_230623,<br>0960_MW140_1.5-2_230623,<br>0960_MW181_3.5-4_230623,<br>0960_MW135_2.5-3_230623,<br>0960_QC302_230623,<br>0960_QC402_230623 | 0960_MW141_1.5-2_230623,<br>0960_MW147_3-3.5_230623,<br>0960_MW180_1-1.5_230623,<br>0960_QC301_230623,<br>0960_QC401_230623, | 23-Jun-2022 | 05-Jul-2022              | 20-Dec-2022        | ✔          | 05-Jul-2022   | 20-Dec-2022      | ✔          |
| EP231P: PFAS Sums                                                                                                                                 |                                                                                                                              |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                                                                                                                           |                                                                                                                              |             |                          |                    |            |               |                  |            |
| 0960_MW134_230623,<br>0960_MW140_1.5-2_230623,<br>0960_MW181_3.5-4_230623,<br>0960_MW135_2.5-3_230623,<br>0960_QC302_230623,<br>0960_QC402_230623 | 0960_MW141_1.5-2_230623,<br>0960_MW147_3-3.5_230623,<br>0960_MW180_1-1.5_230623,<br>0960_QC301_230623,<br>0960_QC401_230623, | 23-Jun-2022 | 05-Jul-2022              | 20-Dec-2022        | ✔          | 05-Jul-2022   | 20-Dec-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                            |         | Count |         | Rate (%) |          |            | Quality Control Specification  |
|--------------------------------------------------------|---------|-------|---------|----------|----------|------------|--------------------------------|
| Analytical Methods                                     | Method  | QC    | Regular | Actual   | Expected | Evaluation |                                |
|                                                        |         |       |         |          |          |            |                                |
| Laboratory Duplicates (DUP)                            |         |       |         |          |          |            |                                |
| Alkalinity by Auto Titrator                            | ED037-P | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 4     | 37      | 10.81    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 36      | 2.78     | 10.00    | ✗          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Laboratory Control Samples (LCS)                       |         |       |         |          |          |            |                                |
| Alkalinity by Auto Titrator                            | ED037-P | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 2     | 37      | 5.41     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 2     | 36      | 5.56     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Method Blanks (MB)                                     |         |       |         |          |          |            |                                |
| Alkalinity by Auto Titrator                            | ED037-P | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 2     | 37      | 5.41     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 2     | 36      | 5.56     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Matrix Spikes (MS)                                     |         |       |         |          |          |            |                                |
| Chloride by Discrete Analyser                          | ED045G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 0     | 36      | 0.00     | 5.00     | ✗          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |



## Brief Method Summaries

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

| Analytical Methods                                                 | Method       | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------------------|--------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alkalinity by Auto Titrator                                        | ED037-P      | WATER  | In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                                                                                                                                                                                                                |
| Sulfate (Turbidimetric) as SO <sub>4</sub> 2- by Discrete Analyser | ED041G       | WATER  | In house: Referenced to APHA 4500-SO <sub>4</sub> . Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO <sub>4</sub> suspension is measured by a photometer and the SO <sub>4</sub> -2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                         |
| Chloride by Discrete Analyser                                      | ED045G       | WATER  | In house: Referenced to APHA 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm.                                                                                                                                                                                                                                                                                                                                                                |
| Major Cations - Dissolved                                          | ED093F       | WATER  | In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                           |
| Ionic Balance by PCT DA and Turbi SO <sub>4</sub> DA               | * EN055 - PG | WATER  | In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS               | EP231X       | WATER  | In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements. |
| Preparation Methods                                                | Method       | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Solid Phase Extraction (SPE) for PFAS in water                     | ORG72        | WATER  | In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.                                                                                                                                                                                                |



# CHAIN OF CUSTODY

COC#: 39278

ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: Learmonth SW/OTH - MB

ORDER NO: pfas-omp Learmonth

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:

## SAMPLE DETAILS

## ANALYSIS REQUIRED

| SAMPLE | NAME        | DESCRIPTION | DATE / TIME         | MATRIX | TOTAL BOTTLES        | ON HOLD | Surface Waters WATER | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION        |
|--------|-------------|-------------|---------------------|--------|----------------------|---------|----------------------|----------------------|-------------------------------|
| 001    | 0960_SW189  |             | 23/06/2022 07:57 AM | Water  | ALS: 5<br>Non ALS: 0 | No      | Partial 4/8          |                      | extra PFAS bottles for lab QC |
| 002    | 0960_QC126  |             | 23/06/2022 07:58 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8          |                      |                               |
| 003    | 0960_SW298  |             | 23/06/2022 09:02 AM | Water  | ALS: 5<br>Non ALS: 0 | No      | Partial 4/8          |                      | extra PFAS bottles for lab QC |
| 004    | 0960_OTH107 |             | 23/06/2022 09:25 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8          |                      |                               |
| 005    | 0960_SW208  |             | 23/06/2022 09:35 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8          |                      |                               |
| 006    | 0960_OTH106 |             | 23/06/2022 09:52 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8          |                      |                               |
| 007    | 0960_SW205  |             | 23/06/2022 10:19 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8          |                      |                               |
| 008    | 0960_SW301  |             | 23/06/2022 10:28 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8          |                      |                               |
| 009    | 0960_SW207  |             | 23/06/2022 01:18 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8          |                      |                               |



# CHAIN OF CUSTODY

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ORDER NO: pfas-omp Learmonth

PROJECT MANAGER:

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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 | Surface Waters WATER | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|-------------|----------------------|---------------------|--------|----------------------|---------|----------------------|----------------------|------------------------|
| 010    | 0960_SW288  |                      | 23/06/2022 02:00 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8          |                      |                        |
| 011    | 0960_OTH134 |                      | 23/06/2022 12:53 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8          |                      |                        |
| 012    | 0960_OTH132 | 2 extra pfas bottles | 23/06/2022 01:27 PM | Water  | ALS: 5<br>Non ALS: 0 | No      | Partial 4/8          |                      |                        |
| 013    | 0960_SW190  |                      | 23/06/2022 01:42 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8          |                      |                        |





# CHAIN OF CUSTODY

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ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: Learmonth SW/OTH - MB

ORDER NO: pfas-omp Learmonth

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:

| SAMPLE | SAMPLE NAME | PARTIAL ANALYSIS GROUP NAME | MATRIX | SELECTED ANALYSIS NAME                                                                                                                                                                                      |
|--------|-------------|-----------------------------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 001    | 0960_SW189  | Surface Waters WATER        | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 002    | 0960_QC126  | Surface Waters WATER        | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 003    | 0960_SW298  | Surface Waters WATER        | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 004    | 0960_OTH107 | Surface Waters WATER        | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 005    | 0960_SW208  | Surface Waters WATER        | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 006    | 0960_OTH106 | Surface Waters WATER        | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 007    | 0960_SW205  | Surface Waters WATER        | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 008    | 0960_SW301  | Surface Waters WATER        | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 009    | 0960_SW207  | Surface Waters WATER        | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |



# CHAIN OF CUSTODY

COC#: 39278

ALS Laboratory: EP Perth

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: Learmonth SW/OTH - MB

ORDER NO: pfas-omp Learmonth

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:

|     |             |                      |       |                                                                                                                                                                                                             |
|-----|-------------|----------------------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 010 | 0960_SW288  | Surface Waters WATER | Water | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 011 | 0960_OTH134 | Surface Waters WATER | Water | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 012 | 0960_OTH132 | Surface Waters WATER | Water | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 013 | 0960_SW190  | Surface Waters WATER | Water | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |



# CHAIN OF CUSTODY

COC#: 39278

ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: Learmonth SW/OTH - MB

ORDER NO: pfas-omp Learmonth

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:

| SAMPLE | SAMPLE NAME | BOTTLE NAME                    | VOLUME | BARCODE        | TYPE  | FILTERED | REASON |
|--------|-------------|--------------------------------|--------|----------------|-------|----------|--------|
| 001    | 0960_SW189  | HDPE (no PTFE)                 | 20 mL  | 00352005019737 | Grey  | No       |        |
| 001    | 0960_SW189  | HDPE (no PTFE)                 | 20 mL  | 00352101057890 | Grey  | No       |        |
| 001    | 0960_SW189  | HDPE (no PTFE)                 | 20 mL  | 00352005019596 | Grey  | No       |        |
| 001    | 0960_SW189  | HDPE (no PTFE)                 | 20 mL  | 00350621041328 | Grey  | No       |        |
| 001    | 0960_SW189  | Clear Plastic Bottle - Natural | 500 mL | 00070621172074 | Green | No       |        |
| 002    | 0960_QC126  | HDPE (no PTFE)                 | 20 mL  | 00350821023754 | Grey  | No       |        |
| 002    | 0960_QC126  | HDPE (no PTFE)                 | 20 mL  | 00350821023857 | Grey  | No       |        |
| 002    | 0960_QC126  | Clear Plastic Bottle - Natural | 500 mL | 00070621089835 | Green | No       |        |
| 003    | 0960_SW298  | Clear Plastic Bottle - Natural | 500 mL | 00070621172042 | Green | No       |        |
| 003    | 0960_SW298  | HDPE (no PTFE)                 | 20 mL  | 00352005019825 | Grey  | No       |        |
| 003    | 0960_SW298  | HDPE (no PTFE)                 | 20 mL  | 00352005019750 | Grey  | No       |        |
| 003    | 0960_SW298  | HDPE (no PTFE)                 | 20 mL  | 00352101057899 | Grey  | No       |        |
| 003    | 0960_SW298  | HDPE (no PTFE)                 | 20 mL  | 00350621046379 | Grey  | No       |        |
| 004    | 0960_OTH107 | Clear Plastic Bottle - Natural | 500 mL | 00070621089667 | Green | No       |        |
| 004    | 0960_OTH107 | HDPE (no PTFE)                 | 20 mL  | 00350821023977 | Grey  | No       |        |
| 004    | 0960_OTH107 | HDPE (no PTFE)                 | 20 mL  | 00350821043242 | Grey  | No       |        |
| 005    | 0960_SW208  | HDPE (no PTFE)                 | 20 mL  | 00350821023801 | Grey  | No       |        |
| 005    | 0960_SW208  | HDPE (no PTFE)                 | 20 mL  | 00350821043233 | Grey  | No       |        |
| 005    | 0960_SW208  | Clear Plastic Bottle - Natural | 500 mL | 00070621089641 | Green | No       |        |
| 006    | 0960_OTH106 | HDPE (no PTFE)                 | 20 mL  | 00350821043215 | Grey  | No       |        |
| 006    | 0960_OTH106 | HDPE (no PTFE)                 | 20 mL  | 00350821023941 | Grey  | No       |        |
| 006    | 0960_OTH106 | Clear Plastic Bottle - Natural | 500 mL | 00070621089922 | Green | No       |        |
| 007    | 0960_SW205  | Clear Plastic Bottle - Natural | 500 mL | 00070621089733 | Green | No       |        |
| 007    | 0960_SW205  | HDPE (no PTFE)                 | 20 mL  | 00350821023790 | Grey  | No       |        |
| 007    | 0960_SW205  | HDPE (no PTFE)                 | 20 mL  | 00350821043205 | Grey  | No       |        |
| 008    | 0960_SW301  | Clear Plastic Bottle - Natural | 500 mL | 00070621191229 | Green | No       |        |



# CHAIN OF CUSTODY

ALS COC#: 39278

ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: Learmonth SW/OTH - MB

ORDER NO: pfas-omp Learmonth

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:

|     |             |                                |        |                |       |    |  |
|-----|-------------|--------------------------------|--------|----------------|-------|----|--|
| 008 | 0960_SW301  | HDPE (no PTFE)                 | 20 mL  | 00352101071763 | Grey  | No |  |
| 008 | 0960_SW301  | HDPE (no PTFE)                 | 20 mL  | 00352101071615 | Grey  | No |  |
| 009 | 0960_SW207  | HDPE (no PTFE)                 | 20 mL  | 00350821023776 | Grey  | No |  |
| 009 | 0960_SW207  | Clear Plastic Bottle - Natural | 500 mL | 00070621089904 | Green | No |  |
| 009 | 0960_SW207  | HDPE (no PTFE)                 | 20 mL  | 00350821023888 | Grey  | No |  |
| 010 | 0960_SW288  | HDPE (no PTFE)                 | 20 mL  | 00350821023833 | Grey  | No |  |
| 010 | 0960_SW288  | HDPE (no PTFE)                 | 20 mL  | 00350821023777 | Grey  | No |  |
| 010 | 0960_SW288  | Clear Plastic Bottle - Natural | 500 mL | 00070621089732 | Green | No |  |
| 011 | 0960_OTH134 | Clear Plastic Bottle - Natural | 500 mL | 00070621089879 | Green | No |  |
| 011 | 0960_OTH134 | HDPE (no PTFE)                 | 20 mL  | 00350821023911 | Grey  | No |  |
| 011 | 0960_OTH134 | HDPE (no PTFE)                 | 20 mL  | 00350821043227 | Grey  | No |  |
| 012 | 0960_OTH132 | HDPE (no PTFE)                 | 20 mL  | 00352101071346 | Grey  | No |  |
| 012 | 0960_OTH132 | HDPE (no PTFE)                 | 20 mL  | 00350019008278 | Grey  | No |  |
| 012 | 0960_OTH132 | Clear Plastic Bottle - Natural | 500 mL | 00070621089857 | Green | No |  |
| 012 | 0960_OTH132 | HDPE (no PTFE)                 | 20 mL  | 00350821023812 | Grey  | No |  |
| 012 | 0960_OTH132 | HDPE (no PTFE)                 | 20 mL  | 00350821023960 | Grey  | No |  |
| 013 | 0960_SW190  | Clear Plastic Bottle - Natural | 500 mL | 00070621089913 | Green | No |  |
| 013 | 0960_SW190  | HDPE (no PTFE)                 | 20 mL  | 00350821023958 | Grey  | No |  |
| 013 | 0960_SW190  | HDPE (no PTFE)                 | 20 mL  | 00350821023937 | Grey  | No |  |

Total Bottle Count: ALS: 45, Non ALS: 0

**SAMPLE RECEIPT NOTIFICATION (SRN)****Work Order : EP2207812**

Client : **STANTEC AUSTRALIA PTY LTD**  
Contact : [REDACTED]  
Address : GROUND FLOOR 226 ADELAIDE  
TERRACE  
PERTH 6000

Laboratory : Environmental Division Perth  
Contact : [REDACTED]  
Address : 26 Rigali Way Wangara Western  
Australia Australia 6065

E-mail : [REDACTED]@stantec.com  
Telephone : ----  
Facsimile : ----

E-mail : [REDACTED]@alsglobal.com  
Telephone : +6138549 9609  
Facsimile : +61-8-9406 1399

Project : WA\_0960\_PFASOMP  
Order number : pfas-omp Learmonth  
C-O-C number : 39278  
Site : Learmonth SW/OTH - [REDACTED]  
Sampler : [REDACTED]

Page : 1 of 2  
Quote number : ES2022MWHAUS0002 (SY/139/19 B)  
QC Level : NEPM 2013 B3 & ALS QC Standard

**Dates**

Date Samples Received : 27-Jun-2022 11:40  
Client Requested Due : 08-Jul-2022  
Date

Issue Date : 28-Jun-2022  
Scheduled Reporting Date : **08-Jul-2022**

**Delivery Details**

Mode of Delivery : Carrier  
No. of coolers/boxes : 5  
Receipt Detail :

Security Seal : Not Available  
Temperature : 13.4 - Ice present  
No. of samples received / analysed : 13 / 13

**General Comments**

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



## Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exists.

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

| Laboratory sample ID | Sampling date / time | Sample ID          | WATER - EN055 - PG<br>Ionic Balance by ED037P, ED041G, ED045G & ED046G | WATER - EP231X<br>PFAS - Full Suite (28 analytes) | WATER - NT-01<br>Major Cations (Ca, Mg, Na, K) | WATER - NT-02<br>Major Anions (Chloride, Sulphate, Alkalinity) |
|----------------------|----------------------|--------------------|------------------------------------------------------------------------|---------------------------------------------------|------------------------------------------------|----------------------------------------------------------------|
| EP2207812-001        | 23-Jun-2022 07:57    | 0960_SW189_220623  | ✓                                                                      | ✓                                                 | ✓                                              | ✓                                                              |
| EP2207812-002        | 23-Jun-2022 07:58    | 0960_QC126_220623  | ✓                                                                      | ✓                                                 | ✓                                              | ✓                                                              |
| EP2207812-003        | 23-Jun-2022 09:02    | 0960_SW298_220623  | ✓                                                                      | ✓                                                 | ✓                                              | ✓                                                              |
| EP2207812-004        | 23-Jun-2022 09:25    | 0960_OTH107_220623 | ✓                                                                      | ✓                                                 | ✓                                              | ✓                                                              |
| EP2207812-005        | 23-Jun-2022 09:35    | 0960_SW208_220623  | ✓                                                                      | ✓                                                 | ✓                                              | ✓                                                              |
| EP2207812-006        | 23-Jun-2022 09:52    | 0960_OTH106_220623 | ✓                                                                      | ✓                                                 | ✓                                              | ✓                                                              |
| EP2207812-007        | 23-Jun-2022 10:19    | 0960_SW205_220623  | ✓                                                                      | ✓                                                 | ✓                                              | ✓                                                              |
| EP2207812-008        | 23-Jun-2022 10:28    | 0960_SW301_220623  | ✓                                                                      | ✓                                                 | ✓                                              | ✓                                                              |
| EP2207812-009        | 23-Jun-2022 13:18    | 0960_SW207_220623  | ✓                                                                      | ✓                                                 | ✓                                              | ✓                                                              |
| EP2207812-010        | 23-Jun-2022 14:00    | 0960_SW288_220623  | ✓                                                                      | ✓                                                 | ✓                                              | ✓                                                              |
| EP2207812-011        | 23-Jun-2022 12:53    | 0960_OTH134_220623 | ✓                                                                      | ✓                                                 | ✓                                              | ✓                                                              |
| EP2207812-012        | 23-Jun-2022 13:27    | 0960_OTH132_220623 | ✓                                                                      | ✓                                                 | ✓                                              | ✓                                                              |
| EP2207812-013        | 23-Jun-2022 13:42    | 0960_SW190_220623  | ✓                                                                      | ✓                                                 | ✓                                              | ✓                                                              |

## Proactive Holding Time Report

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

## Requested Deliverables

|                                                                                                                  |       |                              |
|------------------------------------------------------------------------------------------------------------------|-------|------------------------------|
| <ul style="list-style-type: none"> <li>- A4 - AU Tax Invoice (INV)</li> </ul>                                    | Email | cardno.com.au                |
| <b>DERP LAB REPORTS</b>                                                                                          |       |                              |
| <ul style="list-style-type: none"> <li>- EDI Format - ESDAT (ESDAT)</li> </ul>                                   | Email | derp.labreports@esdat.com.au |
| <ul style="list-style-type: none"> <li>- *AU Certificate of Analysis - NATA (COA)</li> </ul>                     | Email | stantec.com                  |
| <ul style="list-style-type: none"> <li>- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)</li> </ul>    | Email | stantec.com                  |
| <ul style="list-style-type: none"> <li>- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)</li> </ul>            | Email | stantec.com                  |
| <ul style="list-style-type: none"> <li>- A4 - AU Sample Receipt Notification - Environmental HT (SRN)</li> </ul> | Email | stantec.com                  |
| <ul style="list-style-type: none"> <li>- Chain of Custody (CoC) (COC)</li> </ul>                                 | Email | stantec.com                  |
| <ul style="list-style-type: none"> <li>- EDI Format - ESDAT (ESDAT)</li> </ul>                                   | Email | stantec.com                  |
| <ul style="list-style-type: none"> <li>- EDI Format - XTab (XTAB)</li> </ul>                                     | Email | stantec.com                  |

## CERTIFICATE OF ANALYSIS

**Work Order** : **EP2207812**  
**Client** : **STANTEC AUSTRALIA PTY LTD**  
**Contact** : [REDACTED]  
**Address** : GROUND FLOOR 226 ADELAIDE TERRACE  
 PERTH 6000  
**Telephone** : ----  
**Project** : WA\_0960\_PFASOMP  
**Order number** : pfas-omp Learmonth  
**C-O-C number** : 39278  
**Sampler** : [REDACTED]  
**Site** : Learmonth SW/OTH - [REDACTED]  
**Quote number** : SY/139/19 B  
**No. of samples received** : 13  
**No. of samples analysed** : 13

**Page** : 1 of 15  
**Laboratory** : Environmental Division Perth  
**Contact** : [REDACTED]  
**Address** : 26 Rigali Way Wangara Western Australia Australia 6065  
**Telephone** : +6138549 9609  
**Date Samples Received** : 27-Jun-2022 11:40  
**Date Analysis Commenced** : 29-Jun-2022  
**Issue Date** : 11-Jul-2022 14:12



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>                |
|------------------------------------------------------------------------|----------------------------|----------------------------------------------|
| Canhuang Ke                                                            | Inorganics Supervisor      | Perth Inorganics, Wangara, Western Australia |
| <span style="background-color: black; color: black;">[REDACTED]</span> | Laboratory Manager (Perth) | Perth Inorganics, Wangara, Western Australia |
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator           | Sydney Organics, Smithfield, NSW             |





## 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.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- 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.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, 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: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                                   |             |      |       | 0960_OTH134_22062<br>3 | 0960_OTH132_22062<br>3 | ----  | ----  | ----  |
|-------------------------------------------------------------------|-------------|------|-------|------------------------|------------------------|-------|-------|-------|
| Sampling date / time                                              |             |      |       | 23-Jun-2022 12:53      | 23-Jun-2022 13:27      | ----  | ----  | ----  |
| Compound                                                          | CAS Number  | LOR  | Unit  | EP2207812-011          | EP2207812-012          | ----- | ----- | ----- |
| Result                                                            |             |      |       | Result                 | Result                 | ----  | ----  | ----  |
| <b>ED037P: Alkalinity by PC Titrator</b>                          |             |      |       |                        |                        |       |       |       |
| Hydroxide Alkalinity as CaCO <sub>3</sub>                         | DMO-210-001 | 1    | mg/L  | <1                     | <1                     | ----  | ----  | ----  |
| Carbonate Alkalinity as CaCO <sub>3</sub>                         | 3812-32-6   | 1    | mg/L  | <1                     | <1                     | ----  | ----  | ----  |
| Bicarbonate Alkalinity as CaCO <sub>3</sub>                       | 71-52-3     | 1    | mg/L  | 101                    | 154                    | ----  | ----  | ----  |
| Total Alkalinity as CaCO <sub>3</sub>                             | ----        | 1    | mg/L  | 101                    | 154                    | ----  | ----  | ----  |
| <b>ED041G: Sulfate (Turbidimetric) as SO<sub>4</sub> 2- by DA</b> |             |      |       |                        |                        |       |       |       |
| Sulfate as SO <sub>4</sub> - Turbidimetric                        | 14808-79-8  | 1    | mg/L  | 99                     | 2810                   | ----  | ----  | ----  |
| <b>ED045G: Chloride by Discrete Analyser</b>                      |             |      |       |                        |                        |       |       |       |
| Chloride                                                          | 16887-00-6  | 1    | mg/L  | 713                    | 18800                  | ----  | ----  | ----  |
| <b>ED093F: Dissolved Major Cations</b>                            |             |      |       |                        |                        |       |       |       |
| Calcium                                                           | 7440-70-2   | 1    | mg/L  | 36                     | 496                    | ----  | ----  | ----  |
| Magnesium                                                         | 7439-95-4   | 1    | mg/L  | 51                     | 1590                   | ----  | ----  | ----  |
| Sodium                                                            | 7440-23-5   | 1    | mg/L  | 358                    | 11600                  | ----  | ----  | ----  |
| Potassium                                                         | 7440-09-7   | 1    | mg/L  | 28                     | 672                    | ----  | ----  | ----  |
| <b>EN055: Ionic Balance</b>                                       |             |      |       |                        |                        |       |       |       |
| ∅ Total Anions                                                    | ----        | 0.01 | meq/L | 24.2                   | 592                    | ----  | ----  | ----  |
| ∅ Total Cations                                                   | ----        | 0.01 | meq/L | 22.3                   | 677                    | ----  | ----  | ----  |
| ∅ Ionic Balance                                                   | ----        | 0.01 | %     | 4.11                   | 6.73                   | ----  | ----  | ----  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>                      |             |      |       |                        |                        |       |       |       |
| 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  | 0.02                   | <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  | 0.11                   | <0.01                  | ----  | ----  | ----  |
| Perfluorodecane sulfonic acid (PFDS)                              | 335-77-3    | 0.02 | µg/L  | <0.02                  | <0.02                  | ----  | ----  | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>                    |             |      |       |                        |                        |       |       |       |
| 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                  | ----  | ----  | ----  |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_OTH134_22062<br>3 | 0960_OTH132_22062<br>3 | ----  | ----  | ----  |
|------------------------------------------------------------|-------------|------|------|------------------------|------------------------|-------|-------|-------|
| Sampling date / time                                       |             |      |      | 23-Jun-2022 12:53      | 23-Jun-2022 13:27      | ----  | ----  | ----  |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2207812-011          | EP2207812-012          | ----- | ----- | ----- |
|                                                            |             |      |      | Result                 | Result                 | ----  | ----  | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                        |                        |       |       |       |
| 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                  | ----  | ----  | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                        |                        |       |       |       |
| 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                  | ----  | ----  | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                        |                        |       |       |       |
| 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                  | ----  | ----  | ----  |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_OTH134_22062<br>3 | 0960_OTH132_22062<br>3 | ----  | ----  | ----  |
|---------------------------------------------------------------|--------------------|------|------|------------------------|------------------------|-------|-------|-------|
| Sampling date / time                                          |                    |      |      | 23-Jun-2022 12:53      | 23-Jun-2022 13:27      | ----  | ----  | ----  |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2207812-011          | EP2207812-012          | ----- | ----- | ----- |
| Result                                                        |                    |      |      | Result                 | Result                 | ----  | ----  | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                        |                        |       |       |       |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05                  | <0.05                  | ----  | ----  | ----  |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                        |                        |       |       |       |
| Sum of PFAS                                                   | ----               | 0.01 | µg/L | 0.13                   | <0.01                  | ----  | ----  | ----  |
| Sum of PFHxS and PFOS                                         | 355-46-4/1763-23-1 | 0.01 | µg/L | 0.13                   | <0.01                  | ----  | ----  | ----  |
| Sum of PFAS (WA DER List)                                     | ----               | 0.01 | µg/L | 0.13                   | <0.01                  | ----  | ----  | ----  |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                        |                        |       |       |       |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 84.7                   | 90.3                   | ----  | ----  | ----  |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 95.8                   | 101                    | ----  | ----  | ----  |



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                                   |             |      |       | 0960_SW189_220623 | 0960_QC126_220623 | 0960_SW298_220623 | 0960_OTH107_220623<br>3 | 0960_SW208_220623 |
|-------------------------------------------------------------------|-------------|------|-------|-------------------|-------------------|-------------------|-------------------------|-------------------|
| Sampling date / time                                              |             |      |       | 23-Jun-2022 07:57 | 23-Jun-2022 07:58 | 23-Jun-2022 09:02 | 23-Jun-2022 09:25       | 23-Jun-2022 09:35 |
| Compound                                                          | CAS Number  | LOR  | Unit  | EP2207812-001     | EP2207812-002     | EP2207812-003     | EP2207812-004           | EP2207812-005     |
|                                                                   |             |      |       | Result            | Result            | Result            | Result                  | Result            |
| <b>ED037P: Alkalinity by PC Titrator</b>                          |             |      |       |                   |                   |                   |                         |                   |
| Hydroxide Alkalinity as CaCO <sub>3</sub>                         | DMO-210-001 | 1    | mg/L  | <1                | <1                | <1                | <1                      | <1                |
| Carbonate Alkalinity as CaCO <sub>3</sub>                         | 3812-32-6   | 1    | mg/L  | <1                | <1                | <1                | <1                      | <1                |
| Bicarbonate Alkalinity as CaCO <sub>3</sub>                       | 71-52-3     | 1    | mg/L  | 69                | 67                | 73                | 118                     | 129               |
| Total Alkalinity as CaCO <sub>3</sub>                             | ----        | 1    | mg/L  | 69                | 67                | 73                | 118                     | 129               |
| <b>ED041G: Sulfate (Turbidimetric) as SO<sub>4</sub> 2- by DA</b> |             |      |       |                   |                   |                   |                         |                   |
| Sulfate as SO <sub>4</sub> - Turbidimetric                        | 14808-79-8  | 1    | mg/L  | 30                | 31                | 32                | 2720                    | 2720              |
| <b>ED045G: Chloride by Discrete Analyser</b>                      |             |      |       |                   |                   |                   |                         |                   |
| Chloride                                                          | 16887-00-6  | 1    | mg/L  | 310               | 310               | 171               | 18300                   | 18700             |
| <b>ED093F: Dissolved Major Cations</b>                            |             |      |       |                   |                   |                   |                         |                   |
| Calcium                                                           | 7440-70-2   | 1    | mg/L  | 21                | 21                | 26                | 470                     | 447               |
| Magnesium                                                         | 7439-95-4   | 1    | mg/L  | 15                | 15                | 11                | 1500                    | 1440              |
| Sodium                                                            | 7440-23-5   | 1    | mg/L  | 153               | 151               | 84                | 11000                   | 10600             |
| Potassium                                                         | 7440-09-7   | 1    | mg/L  | 15                | 15                | 9                 | 623                     | 599               |
| <b>EN055: Ionic Balance</b>                                       |             |      |       |                   |                   |                   |                         |                   |
| ∅ Total Anions                                                    | ----        | 0.01 | meq/L | 10.7              | 10.7              | 6.95              | 575                     | 587               |
| ∅ Total Cations                                                   | ----        | 0.01 | meq/L | 9.32              | 9.23              | 6.09              | 641                     | 617               |
| ∅ Ionic Balance                                                   | ----        | 0.01 | %     | 7.11              | 7.49              | 6.61              | 5.43                    | 2.53              |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>                      |             |      |       |                   |                   |                   |                         |                   |
| 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  | 0.14              | 0.14              | <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             |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>                    |             |      |       |                   |                   |                   |                         |                   |
| 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             |



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_SW189_220623 | 0960_QC126_220623 | 0960_SW298_220623 | 0960_OTH107_220623<br>3 | 0960_SW208_220623 |
|------------------------------------------------------------|-------------|------|------|-------------------|-------------------|-------------------|-------------------------|-------------------|
| Sampling date / time                                       |             |      |      | 23-Jun-2022 07:57 | 23-Jun-2022 07:58 | 23-Jun-2022 09:02 | 23-Jun-2022 09:25       | 23-Jun-2022 09:35 |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2207812-001     | EP2207812-002     | EP2207812-003     | EP2207812-004           | EP2207812-005     |
|                                                            |             |      |      | Result            | Result            | Result            | Result                  | Result            |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                   |                   |                   |                         |                   |
| 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 (PFTTrDA)                        | 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             |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                   |                   |                   |                         |                   |
| Perfluorooctane sulfonamide (FOSA)                         | 754-91-6    | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02                   | <0.02             |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)              | 31506-32-8  | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05                   | <0.05             |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)               | 4151-50-2   | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05                   | <0.05             |
| N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)       | 24448-09-7  | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05                   | <0.05             |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)        | 1691-99-2   | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05                   | <0.05             |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)  | 2355-31-9   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02                   | <0.02             |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)   | 2991-50-6   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02                   | <0.02             |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                   |                   |                   |                         |                   |
| 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             |



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_SW189_220623 | 0960_QC126_220623 | 0960_SW298_220623 | 0960_OTH107_220623<br>3 | 0960_SW208_220623 |
|---------------------------------------------------------------|--------------------|------|------|-------------------|-------------------|-------------------|-------------------------|-------------------|
| Sampling date / time                                          |                    |      |      | 23-Jun-2022 07:57 | 23-Jun-2022 07:58 | 23-Jun-2022 09:02 | 23-Jun-2022 09:25       | 23-Jun-2022 09:35 |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2207812-001     | EP2207812-002     | EP2207812-003     | EP2207812-004           | EP2207812-005     |
|                                                               |                    |      |      | Result            | Result            | Result            | Result                  | Result            |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                   |                   |                   |                         |                   |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05                   | <0.05             |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                   |                   |                   |                         |                   |
| Sum of PFAS                                                   | ----               | 0.01 | µg/L | 0.14              | 0.14              | <0.01             | <0.01                   | <0.01             |
| Sum of PFHxS and PFOS                                         | 355-46-4/1763-23-1 | 0.01 | µg/L | 0.14              | 0.14              | <0.01             | <0.01                   | <0.01             |
| Sum of PFAS (WA DER List)                                     | ----               | 0.01 | µg/L | 0.14              | 0.14              | <0.01             | <0.01                   | <0.01             |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                   |                   |                   |                         |                   |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 93.4              | 96.1              | 91.4              | 95.2                    | 93.5              |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 104               | 102               | 99.6              | 99.8                    | 95.4              |





## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                                   |             |      |       | 0960_OTH106_220623 | 0960_SW205_220623 | 0960_SW301_220623 | 0960_SW207_220623 | 0960_SW288_220623 |
|-------------------------------------------------------------------|-------------|------|-------|--------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                              |             |      |       | 23-Jun-2022 09:52  | 23-Jun-2022 10:19 | 23-Jun-2022 10:28 | 23-Jun-2022 13:18 | 23-Jun-2022 14:00 |
| Compound                                                          | CAS Number  | LOR  | Unit  | EP2207812-006      | EP2207812-007     | EP2207812-008     | EP2207812-009     | EP2207812-010     |
|                                                                   |             |      |       | Result             | Result            | Result            | Result            | Result            |
| <b>ED037P: Alkalinity by PC Titrator</b>                          |             |      |       |                    |                   |                   |                   |                   |
| Hydroxide Alkalinity as CaCO <sub>3</sub>                         | DMO-210-001 | 1    | mg/L  | <1                 | <1                | <1                | <1                | <1                |
| Carbonate Alkalinity as CaCO <sub>3</sub>                         | 3812-32-6   | 1    | mg/L  | <1                 | <1                | <1                | <1                | <1                |
| Bicarbonate Alkalinity as CaCO <sub>3</sub>                       | 71-52-3     | 1    | mg/L  | 121                | 278               | 205               | 185               | 108               |
| Total Alkalinity as CaCO <sub>3</sub>                             | ----        | 1    | mg/L  | 121                | 278               | 205               | 185               | 108               |
| <b>ED041G: Sulfate (Turbidimetric) as SO<sub>4</sub> 2- by DA</b> |             |      |       |                    |                   |                   |                   |                   |
| Sulfate as SO <sub>4</sub> - Turbidimetric                        | 14808-79-8  | 1    | mg/L  | 2750               | 3570              | 4920              | 2670              | 78                |
| <b>ED045G: Chloride by Discrete Analyser</b>                      |             |      |       |                    |                   |                   |                   |                   |
| Chloride                                                          | 16887-00-6  | 1    | mg/L  | 18400              | 23600             | 35800             | 18200             | 407               |
| <b>ED093F: Dissolved Major Cations</b>                            |             |      |       |                    |                   |                   |                   |                   |
| Calcium                                                           | 7440-70-2   | 1    | mg/L  | 414                | 531               | 777               | 481               | 36                |
| Magnesium                                                         | 7439-95-4   | 1    | mg/L  | 1340               | 1810              | 2560              | 1490              | 28                |
| Sodium                                                            | 7440-23-5   | 1    | mg/L  | 9770               | 13500             | 18800             | 10900             | 199               |
| Potassium                                                         | 7440-09-7   | 1    | mg/L  | 553                | 719               | 1040              | 612               | 20                |
| <b>EN055: Ionic Balance</b>                                       |             |      |       |                    |                   |                   |                   |                   |
| ∅ Total Anions                                                    | ----        | 0.01 | meq/L | 579                | 746               | 1120              | 573               | 15.3              |
| ∅ Total Cations                                                   | ----        | 0.01 | meq/L | 570                | 781               | 1090              | 636               | 13.3              |
| ∅ Ionic Balance                                                   | ----        | 0.01 | %     | 0.75               | 2.32              | 1.02              | 5.27              | 6.99              |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>                      |             |      |       |                    |                   |                   |                   |                   |
| 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             | 0.02              |
| 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             | 0.17              |
| Perfluorodecane sulfonic acid (PFDS)                              | 335-77-3    | 0.02 | µg/L  | <0.02              | <0.02             | <0.02             | <0.02             | <0.02             |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>                    |             |      |       |                    |                   |                   |                   |                   |
| 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             |



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_OTH106_220623 | 0960_SW205_220623 | 0960_SW301_220623 | 0960_SW207_220623 | 0960_SW288_220623 |
|------------------------------------------------------------|-------------|------|------|--------------------|-------------------|-------------------|-------------------|-------------------|
|                                                            |             |      |      | 3                  |                   |                   |                   |                   |
| Sampling date / time                                       |             |      |      | 23-Jun-2022 09:52  | 23-Jun-2022 10:19 | 23-Jun-2022 10:28 | 23-Jun-2022 13:18 | 23-Jun-2022 14:00 |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2207812-006      | EP2207812-007     | EP2207812-008     | EP2207812-009     | EP2207812-010     |
|                                                            |             |      |      | Result             | Result            | Result            | Result            | Result            |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                    |                   |                   |                   |                   |
| 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             |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                    |                   |                   |                   |                   |
| Perfluorooctane sulfonamide (FOSA)                         | 754-91-6    | 0.02 | µg/L | <0.02              | <0.02             | <0.02             | <0.02             | <0.02             |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)              | 31506-32-8  | 0.05 | µg/L | <0.05              | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)               | 4151-50-2   | 0.05 | µg/L | <0.05              | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)       | 24448-09-7  | 0.05 | µg/L | <0.05              | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)        | 1691-99-2   | 0.05 | µg/L | <0.05              | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)  | 2355-31-9   | 0.02 | µg/L | <0.02              | <0.02             | <0.02             | <0.02             | <0.02             |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)   | 2991-50-6   | 0.02 | µg/L | <0.02              | <0.02             | <0.02             | <0.02             | <0.02             |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                    |                   |                   |                   |                   |
| 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             |



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_OTH106_220623 | 0960_SW205_220623 | 0960_SW301_220623 | 0960_SW207_220623 | 0960_SW288_220623 |
|---------------------------------------------------------------|--------------------|------|------|--------------------|-------------------|-------------------|-------------------|-------------------|
|                                                               |                    |      |      | 3                  |                   |                   |                   |                   |
| Sampling date / time                                          |                    |      |      | 23-Jun-2022 09:52  | 23-Jun-2022 10:19 | 23-Jun-2022 10:28 | 23-Jun-2022 13:18 | 23-Jun-2022 14:00 |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2207812-006      | EP2207812-007     | EP2207812-008     | EP2207812-009     | EP2207812-010     |
|                                                               |                    |      |      | Result             | Result            | Result            | Result            | Result            |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                    |                   |                   |                   |                   |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05              | <0.05             | <0.05             | <0.05             | <0.05             |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                    |                   |                   |                   |                   |
| Sum of PFAS                                                   | ----               | 0.01 | µg/L | <0.01              | <0.01             | <0.01             | <0.01             | 0.19              |
| Sum of PFHxS and PFOS                                         | 355-46-4/1763-23-1 | 0.01 | µg/L | <0.01              | <0.01             | <0.01             | <0.01             | 0.19              |
| Sum of PFAS (WA DER List)                                     | ----               | 0.01 | µg/L | <0.01              | <0.01             | <0.01             | <0.01             | 0.19              |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                    |                   |                   |                   |                   |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 96.9               | 99.4              | 90.1              | 100               | 88.3              |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 104                | 100               | 97.9              | 102               | 100               |



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

0960\_SW190\_220623

| Sampling date / time                                   |             |      |       | 23-Jun-2022 13:42 | ----  | ----  | ----  | ----  |
|--------------------------------------------------------|-------------|------|-------|-------------------|-------|-------|-------|-------|
| Compound                                               | CAS Number  | LOR  | Unit  | EP2207812-013     | ----- | ----- | ----- | ----- |
| Result                                                 |             |      |       | ----              | ----  | ----  | ----  | ----  |
| <b>ED037P: Alkalinity by PC Titrator</b>               |             |      |       |                   |       |       |       |       |
| Hydroxide Alkalinity as CaCO3                          | DMO-210-001 | 1    | mg/L  | <1                | ----  | ----  | ----  | ----  |
| Carbonate Alkalinity as CaCO3                          | 3812-32-6   | 1    | mg/L  | 2                 | ----  | ----  | ----  | ----  |
| Bicarbonate Alkalinity as CaCO3                        | 71-52-3     | 1    | mg/L  | 98                | ----  | ----  | ----  | ----  |
| Total Alkalinity as CaCO3                              | ----        | 1    | mg/L  | 100               | ----  | ----  | ----  | ----  |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b> |             |      |       |                   |       |       |       |       |
| Sulfate as SO4 - Turbidimetric                         | 14808-79-8  | 1    | mg/L  | 62                | ----  | ----  | ----  | ----  |
| <b>ED045G: Chloride by Discrete Analyser</b>           |             |      |       |                   |       |       |       |       |
| Chloride                                               | 16887-00-6  | 1    | mg/L  | 251               | ----  | ----  | ----  | ----  |
| <b>ED093F: Dissolved Major Cations</b>                 |             |      |       |                   |       |       |       |       |
| Calcium                                                | 7440-70-2   | 1    | mg/L  | 32                | ----  | ----  | ----  | ----  |
| Magnesium                                              | 7439-95-4   | 1    | mg/L  | 18                | ----  | ----  | ----  | ----  |
| Sodium                                                 | 7440-23-5   | 1    | mg/L  | 130               | ----  | ----  | ----  | ----  |
| Potassium                                              | 7440-09-7   | 1    | mg/L  | 15                | ----  | ----  | ----  | ----  |
| <b>EN055: Ionic Balance</b>                            |             |      |       |                   |       |       |       |       |
| ∅ Total Anions                                         | ----        | 0.01 | meq/L | 10.4              | ----  | ----  | ----  | ----  |
| ∅ Total Cations                                        | ----        | 0.01 | meq/L | 9.12              | ----  | ----  | ----  | ----  |
| ∅ Ionic Balance                                        | ----        | 0.01 | %     | 6.43              | ----  | ----  | ----  | ----  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>           |             |      |       |                   |       |       |       |       |
| 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  | 0.02              | ----  | ----  | ----  | ----  |
| Perfluoroheptane sulfonic acid (PFHpS)                 | 375-92-8    | 0.02 | µg/L  | <0.02             | ----  | ----  | ----  | ----  |
| Perfluorooctane sulfonic acid (PFOS)                   | 1763-23-1   | 0.01 | µg/L  | 0.20              | ----  | ----  | ----  | ----  |
| Perfluorodecane sulfonic acid (PFDS)                   | 335-77-3    | 0.02 | µg/L  | <0.02             | ----  | ----  | ----  | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>         |             |      |       |                   |       |       |       |       |
| 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             | ----  | ----  | ----  | ----  |



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

0960\_SW190\_220623

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Sampling date / time

23-Jun-2022 13:42

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Compound

CAS Number

LOR

Unit

EP2207812-013

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Result

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### EP231B: Perfluoroalkyl Carboxylic Acids - Continued

|                                      |            |      |      |       |      |      |      |      |
|--------------------------------------|------------|------|------|-------|------|------|------|------|
| Perfluorooctanoic acid (PFOA)        | 335-67-1   | 0.01 | µg/L | <0.01 | ---- | ---- | ---- | ---- |
| Perfluorononanoic acid (PFNA)        | 375-95-1   | 0.02 | µg/L | <0.02 | ---- | ---- | ---- | ---- |
| Perfluorodecanoic acid (PFDA)        | 335-76-2   | 0.02 | µg/L | <0.02 | ---- | ---- | ---- | ---- |
| Perfluoroundecanoic acid (PFUnDA)    | 2058-94-8  | 0.02 | µg/L | <0.02 | ---- | ---- | ---- | ---- |
| Perfluorododecanoic acid (PFDoDA)    | 307-55-1   | 0.02 | µg/L | <0.02 | ---- | ---- | ---- | ---- |
| Perfluorotridecanoic acid (PFTrDA)   | 72629-94-8 | 0.02 | µg/L | <0.02 | ---- | ---- | ---- | ---- |
| Perfluorotetradecanoic acid (PFTeDA) | 376-06-7   | 0.05 | µg/L | <0.05 | ---- | ---- | ---- | ---- |

### EP231C: Perfluoroalkyl Sulfonamides

|                                                           |            |      |      |       |      |      |      |      |
|-----------------------------------------------------------|------------|------|------|-------|------|------|------|------|
| Perfluorooctane sulfonamide (FOSA)                        | 754-91-6   | 0.02 | µg/L | <0.02 | ---- | ---- | ---- | ---- |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8 | 0.05 | µg/L | <0.05 | ---- | ---- | ---- | ---- |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2  | 0.05 | µg/L | <0.05 | ---- | ---- | ---- | ---- |
| N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7 | 0.05 | µg/L | <0.05 | ---- | ---- | ---- | ---- |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2  | 0.05 | µg/L | <0.05 | ---- | ---- | ---- | ---- |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9  | 0.02 | µg/L | <0.02 | ---- | ---- | ---- | ---- |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6  | 0.02 | µg/L | <0.02 | ---- | ---- | ---- | ---- |

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

|                                           |             |      |      |       |      |      |      |      |
|-------------------------------------------|-------------|------|------|-------|------|------|------|------|
| 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 | ---- | ---- | ---- | ---- |



## Analytical Results

|                                                        |                    |      |      |                      |                   |       |       |       |       |
|--------------------------------------------------------|--------------------|------|------|----------------------|-------------------|-------|-------|-------|-------|
| Sub-Matrix: SURFACE WATER<br>(Matrix: WATER)           |                    |      |      | Sample ID            | 0960_SW190_220623 | ----  | ----  | ----  | ----  |
|                                                        |                    |      |      | Sampling date / time | 23-Jun-2022 13:42 | ----  | ----  | ----  | ----  |
| Compound                                               | CAS Number         | LOR  | Unit |                      | EP2207812-013     | ----- | ----- | ----- | ----- |
|                                                        |                    |      |      | Result               |                   | ----  | ----  | ----  | ----  |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued |                    |      |      |                      |                   |       |       |       |       |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)         | 120226-60-0        | 0.05 | µg/L |                      | <0.05             | ----  | ----  | ----  | ----  |
| EP231P: PFAS Sums                                      |                    |      |      |                      |                   |       |       |       |       |
| Sum of PFAS                                            | ----               | 0.01 | µg/L |                      | 0.22              | ----  | ----  | ----  | ----  |
| Sum of PFHxS and PFOS                                  | 355-46-4/1763-23-1 | 0.01 | µg/L |                      | 0.22              | ----  | ----  | ----  | ----  |
| Sum of PFAS (WA DER List)                              | ----               | 0.01 | µg/L |                      | 0.22              | ----  | ----  | ----  | ----  |
| EP231S: PFAS Surrogate                                 |                    |      |      |                      |                   |       |       |       |       |
| 13C4-PFOS                                              | ----               | 0.02 | %    |                      | 95.4              | ----  | ----  | ----  | ----  |
| 13C8-PFOA                                              | ----               | 0.02 | %    |                      | 104               | ----  | ----  | ----  | ----  |



### Surrogate Control Limits

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

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

### Inter-Laboratory Testing

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

|                                |                                                           |                                |                                                                 |
|--------------------------------|-----------------------------------------------------------|--------------------------------|-----------------------------------------------------------------|
| <b>Work Order</b>              | <b>: EP2207812</b>                                        | <b>Page</b>                    | <b>: 1 of 9</b>                                                 |
| <b>Client</b>                  | <b>: STANTEC AUSTRALIA PTY LTD</b>                        | <b>Laboratory</b>              | <b>: Environmental Division Perth</b>                           |
| <b>Contact</b>                 | <b>: [REDACTED]</b>                                       | <b>Contact</b>                 | <b>: [REDACTED]</b>                                             |
| <b>Address</b>                 | <b>: GROUND FLOOR 226 ADELAIDE TERRACE<br/>PERTH 6000</b> | <b>Address</b>                 | <b>: 26 Rigali Way Wangara Western Australia Australia 6065</b> |
| <b>Telephone</b>               | <b>: ----</b>                                             | <b>Telephone</b>               | <b>: +6138549 9609</b>                                          |
| <b>Project</b>                 | <b>: WA_0960_PFASOMP</b>                                  | <b>Date Samples Received</b>   | <b>: 27-Jun-2022</b>                                            |
| <b>Order number</b>            | <b>: pfas-omp Learmonth</b>                               | <b>Date Analysis Commenced</b> | <b>: 29-Jun-2022</b>                                            |
| <b>C-O-C number</b>            | <b>: 39278</b>                                            | <b>Issue Date</b>              | <b>: 11-Jul-2022</b>                                            |
| <b>Sampler</b>                 | <b>: [REDACTED]</b>                                       |                                |                                                                 |
| <b>Site</b>                    | <b>: Learmonth SW/OTH - [REDACTED]</b>                    |                                |                                                                 |
| <b>Quote number</b>            | <b>: SY/139/19 B</b>                                      |                                |                                                                 |
| <b>No. of samples received</b> | <b>: 13</b>                                               |                                |                                                                 |
| <b>No. of samples analysed</b> | <b>: 13</b>                                               |                                |                                                                 |



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>                |
|--------------------|----------------------------|----------------------------------------------|
| Canhuang Ke        | Inorganics Supervisor      | Perth Inorganics, Wangara, Western Australia |
| [REDACTED]         | Laboratory Manager (Perth) | Perth Inorganics, Wangara, Western Australia |
| [REDACTED]         | LCMS Coordinator           | Sydney Organics, Smithfield, NSW             |



## 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**

| Sub-Matrix: WATER                                                 |                    |                                          |             | Laboratory Duplicate (DUP) Report |      |                 |                  |         |                    |
|-------------------------------------------------------------------|--------------------|------------------------------------------|-------------|-----------------------------------|------|-----------------|------------------|---------|--------------------|
| Laboratory sample ID                                              | Sample ID          | Method: Compound                         | CAS Number  | LOR                               | Unit | Original Result | Duplicate Result | RPD (%) | Acceptable RPD (%) |
| ED037P: Alkalinity by PC Titrator (QC Lot: 4447990)               |                    |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207737-004                                                     | Anonymous          | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                    | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                    | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 930             | 939              | 1.0     | 0% - 20%           |
|                                                                   |                    | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 930             | 939              | 1.0     | 0% - 20%           |
| EP2207812-001                                                     | 0960_SW189_220623  | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                    | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                    | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 69              | 68               | 0.0     | 0% - 20%           |
|                                                                   |                    | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 69              | 68               | 0.0     | 0% - 20%           |
| ED037P: Alkalinity by PC Titrator (QC Lot: 4447991)               |                    |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207812-012                                                     | 0960_OTH132_220623 | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                    | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                    | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 154             | 153              | 0.7     | 0% - 20%           |
|                                                                   |                    | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 154             | 153              | 0.7     | 0% - 20%           |
| EP2207891-008                                                     | Anonymous          | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                    | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                    | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 93              | 94               | 1.1     | 0% - 20%           |
|                                                                   |                    | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 93              | 94               | 1.1     | 0% - 20%           |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4429759) |                    |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207739-003                                                     | Anonymous          | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 1800            | 1810             | 0.6     | 0% - 20%           |
| EP2207812-010                                                     | 0960_SW288_220623  | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 78              | 82               | 5.5     | 0% - 20%           |
| ED045G: Chloride by Discrete Analyser (QC Lot: 4429758)           |                    |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207739-003                                                     | Anonymous          | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 12800           | 11800            | 8.4     | 0% - 20%           |
| EP2207812-010                                                     | 0960_SW288_220623  | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 407             | 410              | 0.8     | 0% - 20%           |



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 (%) |
| ED093F: Dissolved Major Cations (QC Lot: 4428393)         |                    |                                                |            |                                   |      |                 |                  |         |                    |
| EP2207810-004                                             | Anonymous          | ED093F: Calcium                                | 7440-70-2  | 1                                 | mg/L | 909             | 903              | 0.7     | 0% - 20%           |
|                                                           |                    | ED093F: Magnesium                              | 7439-95-4  | 1                                 | mg/L | 2730            | 2760             | 0.9     | 0% - 20%           |
|                                                           |                    | ED093F: Sodium                                 | 7440-23-5  | 1                                 | mg/L | 20500           | 20700            | 0.9     | 0% - 20%           |
|                                                           |                    | ED093F: Potassium                              | 7440-09-7  | 1                                 | mg/L | 1150            | 1150             | 0.0     | 0% - 20%           |
| EP2207812-007                                             | 0960_SW205_220623  | ED093F: Calcium                                | 7440-70-2  | 1                                 | mg/L | 531             | 603              | 12.7    | 0% - 20%           |
|                                                           |                    | ED093F: Magnesium                              | 7439-95-4  | 1                                 | mg/L | 1810            | 2040             | 12.0    | 0% - 20%           |
|                                                           |                    | ED093F: Sodium                                 | 7440-23-5  | 1                                 | mg/L | 13500           | 15300            | 12.5    | 0% - 20%           |
|                                                           |                    | ED093F: Potassium                              | 7440-09-7  | 1                                 | mg/L | 719             | 840              | 15.5    | 0% - 20%           |
| EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4439369)   |                    |                                                |            |                                   |      |                 |                  |         |                    |
| EP2207812-001                                             | 0960_SW189_220623  | 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 | 0.14            | 0.14             | 0.0     | 0% - 50%           |
|                                                           |                    | EP231X: Perfluorobutane sulfonic acid (PFBS)   | 375-73-5   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |                    | EP231X: Perfluoropentane sulfonic acid (PFPeS) | 2706-91-4  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |                    | EP231X: Perfluoroheptane sulfonic acid (PFHpS) | 375-92-8   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |                    | EP231X: Perfluorodecane sulfonic acid (PFDS)   | 335-77-3   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
| EP2207812-012                                             | 0960_OTH132_220623 | 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: 4439369) |                    |                                                |            |                                   |      |                 |                  |         |                    |
| EP2207812-001                                             | 0960_SW189_220623  | 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 (PFTeDA)     | 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           |
| EP2207812-012                                             | 0960_OTH132_220623 | 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**

| Sub-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: 4439369) - continued |                    |                                                                   |             |                                   |      |                 |                  |         |                    |
| EP2207812-012                                                         | 0960_OTH132_220623 | 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: 4439369)                 |                    |                                                                   |             |                                   |      |                 |                  |         |                    |
| EP2207812-001                                                         | 0960_SW189_220623  | 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           |
| EP2207812-012                                                         | 0960_OTH132_220623 | 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: 4439369)          |                    |                                                                   |             |                                   |      |                 |                  |         |                    |
| EP2207812-001                                                         | 0960_SW189_220623  | 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           |

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 Work Order : EP2207812  
 Client : STANTEC AUSTRALIA PTY LTD  
 Project : WA\_0960\_PFASOMP



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 (%) |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4439369) - continued |                    |                                                     |             |                                   |      |                 |                  |         |                    |
| EP2207812-012                                                            | 0960_OTH132_220623 | 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: 4439369)                                      |                    |                                                     |             |                                   |      |                 |                  |         |                    |
| EP2207812-001                                                            | 0960_SW189_220623  | EP231X: Sum of PFAS                                 | ----        | 0.01                              | µg/L | 0.14            | 0.14             | 0.0     | 0% - 50%           |
| EP2207812-012                                                            | 0960_OTH132_220623 | EP231X: Sum of PFAS                                 | ----        | 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**

| Sub-Matrix: WATER                                                |             |      |      | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |      |
|------------------------------------------------------------------|-------------|------|------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|------|
|                                                                  |             |      |      |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |      |
| Method: Compound                                                 | CAS Number  | LOR  | Unit | Result                      |                                       |                           |                                   |      |
| ED037P: Alkalinity by PC Titrator (QCLot: 4447990)               |             |      |      |                             |                                       |                           |                                   |      |
| ED037-P: Hydroxide Alkalinity as CaCO3                           | DMO-210-001 | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Carbonate Alkalinity as CaCO3                           | 3812-32-6   | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Bicarbonate Alkalinity as CaCO3                         | 71-52-3     | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Total Alkalinity as CaCO3                               | ----        | 1    | mg/L | <1                          | 20 mg/L                               | 107                       | 87.8                              | 118  |
|                                                                  |             |      |      | <1                          | 200 mg/L                              | 94.9                      | 87.8                              | 118  |
| ED037P: Alkalinity by PC Titrator (QCLot: 4447991)               |             |      |      |                             |                                       |                           |                                   |      |
| ED037-P: Hydroxide Alkalinity as CaCO3                           | DMO-210-001 | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Carbonate Alkalinity as CaCO3                           | 3812-32-6   | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Bicarbonate Alkalinity as CaCO3                         | 71-52-3     | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Total Alkalinity as CaCO3                               | ----        | 1    | mg/L | <1                          | 20 mg/L                               | 107                       | 87.8                              | 118  |
|                                                                  |             |      |      | <1                          | 200 mg/L                              | 98.2                      | 87.8                              | 118  |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4429759) |             |      |      |                             |                                       |                           |                                   |      |
| ED041G: Sulfate as SO4 - Turbidimetric                           | 14808-79-8  | 1    | mg/L | <1                          | 25 mg/L                               | 96.1                      | 89.9                              | 112  |
|                                                                  |             |      |      | <1                          | 500 mg/L                              | 103                       | 89.9                              | 112  |
| ED045G: Chloride by Discrete Analyser (QCLot: 4429758)           |             |      |      |                             |                                       |                           |                                   |      |
| ED045G: Chloride                                                 | 16887-00-6  | 1    | mg/L | <1                          | 10 mg/L                               | 109                       | 88.6                              | 113  |
|                                                                  |             |      |      | <1                          | 1000 mg/L                             | 102                       | 88.6                              | 113  |
| ED093F: Dissolved Major Cations (QCLot: 4428393)                 |             |      |      |                             |                                       |                           |                                   |      |
| ED093F: Calcium                                                  | 7440-70-2   | 1    | mg/L | <1                          | 50 mg/L                               | 108                       | 86.5                              | 117  |
| ED093F: Magnesium                                                | 7439-95-4   | 1    | mg/L | <1                          | 50 mg/L                               | 108                       | 88.4                              | 110  |
| ED093F: Sodium                                                   | 7440-23-5   | 1    | mg/L | <1                          | 50 mg/L                               | 113                       | 91.4                              | 113  |
| ED093F: Potassium                                                | 7440-09-7   | 1    | mg/L | <1                          | 50 mg/L                               | 99.5                      | 84.6                              | 108  |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4439369)           |             |      |      |                             |                                       |                           |                                   |      |
| EP231X: Perfluorobutane sulfonic acid (PFBS)                     | 375-73-5    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 127                       | 72.0                              | 130  |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)                   | 2706-91-4   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 120                       | 71.0                              | 127  |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)                    | 355-46-4    | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 118                       | 68.0                              | 131  |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)                   | 375-92-8    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 125                       | 69.0                              | 134  |
| EP231X: Perfluorooctane sulfonic acid (PFOS)                     | 1763-23-1   | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 114                       | 65.0                              | 140  |
| EP231X: Perfluorodecane sulfonic acid (PFDS)                     | 335-77-3    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 127                       | 53.0                              | 142  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4439369)         |             |      |      |                             |                                       |                           |                                   |      |
| 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                             | 126                       | 72.0                              | 129  |

## Sub-Matrix: WATER

| Sub-Matrix: WATER                                                    |             |      |      | Method Blank (MB) Report | Laboratory Control Spike (LCS) Report |                    |                       |      |
|----------------------------------------------------------------------|-------------|------|------|--------------------------|---------------------------------------|--------------------|-----------------------|------|
|                                                                      |             |      |      |                          | Spike Concentration                   | Spike Recovery (%) | Acceptable Limits (%) |      |
| Method: Compound                                                     | CAS Number  | LOR  | Unit | Result                   |                                       | LCS                | Low                   | High |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4439369) - continued |             |      |      |                          |                                       |                    |                       |      |
| EP231X: Perfluorohexanoic acid (PFHxA)                               | 307-24-4    | 0.02 | µg/L | <0.02                    | 0.25 µg/L                             | 125                | 72.0                  | 129  |
| EP231X: Perfluoroheptanoic acid (PFHpA)                              | 375-85-9    | 0.02 | µg/L | <0.02                    | 0.25 µg/L                             | 117                | 72.0                  | 130  |
| EP231X: Perfluorooctanoic acid (PFOA)                                | 335-67-1    | 0.01 | µg/L | <0.01                    | 0.25 µg/L                             | 132                | 71.0                  | 133  |
| EP231X: Perfluorononanoic acid (PFNA)                                | 375-95-1    | 0.02 | µg/L | <0.02                    | 0.25 µg/L                             | 129                | 69.0                  | 130  |
| EP231X: Perfluorodecanoic acid (PFDA)                                | 335-76-2    | 0.02 | µg/L | <0.02                    | 0.25 µg/L                             | 116                | 71.0                  | 129  |
| EP231X: Perfluoroundecanoic acid (PFUnDA)                            | 2058-94-8   | 0.02 | µg/L | <0.02                    | 0.25 µg/L                             | 127                | 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                             | 126                | 65.0                  | 144  |
| EP231X: Perfluorotetradecanoic acid (PFTeDA)                         | 376-06-7    | 0.05 | µg/L | <0.05                    | 0.625 µg/L                            | 122                | 71.0                  | 132  |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4439369)                 |             |      |      |                          |                                       |                    |                       |      |
| EP231X: Perfluorooctane sulfonamide (FOSA)                           | 754-91-6    | 0.02 | µg/L | <0.02                    | 0.25 µg/L                             | 134                | 67.0                  | 137  |
| EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)                | 31506-32-8  | 0.05 | µg/L | <0.05                    | 0.625 µg/L                            | 126                | 68.0                  | 141  |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)                 | 4151-50-2   | 0.05 | µg/L | <0.05                    | 0.625 µg/L                            | 116                | 62.6                  | 147  |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)         | 24448-09-7  | 0.05 | µg/L | <0.05                    | 0.625 µg/L                            | 116                | 66.0                  | 145  |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)          | 1691-99-2   | 0.05 | µg/L | <0.05                    | 0.625 µg/L                            | 114                | 57.6                  | 145  |
| 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                             | 122                | 61.0                  | 135  |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4439369)          |             |      |      |                          |                                       |                    |                       |      |
| EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                    | 757124-72-4 | 0.05 | µg/L | <0.05                    | 0.25 µg/L                             | 129                | 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                             | 120                | 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                             | 135                | 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                             | 136                | 71.4                  | 144  |

## Matrix Spike (MS) Report

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

## Sub-Matrix: WATER

|                                                                  |           |                                        |            |                          |                  |                       |      |
|------------------------------------------------------------------|-----------|----------------------------------------|------------|--------------------------|------------------|-----------------------|------|
| Sub-Matrix: <b>WATER</b>                                         |           |                                        |            | Matrix Spike (MS) Report |                  |                       |      |
|                                                                  |           |                                        |            | Spike                    | SpikeRecovery(%) | Acceptable Limits (%) |      |
| Laboratory sample ID                                             | Sample ID | Method: Compound                       | CAS Number | Concentration            | MS               | Low                   | High |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4429759) |           |                                        |            |                          |                  |                       |      |
| EP2207739-003                                                    | Anonymous | ED041G: Sulfate as SO4 - Turbidimetric | 14808-79-8 | 100 mg/L                 | # Not Determined | 70.4                  | 130  |
| ED045G: Chloride by Discrete Analyser (QCLot: 4429758)           |           |                                        |            |                          |                  |                       |      |





Sub-Matrix: **WATER**

| Sub-Matrix: WATER                                                  |                   |                                                                   |             | Matrix Spike (MS) Report |                  |                       |      |
|--------------------------------------------------------------------|-------------------|-------------------------------------------------------------------|-------------|--------------------------|------------------|-----------------------|------|
|                                                                    |                   |                                                                   |             | Spike                    | SpikeRecovery(%) | Acceptable Limits (%) |      |
| Laboratory sample ID                                               | Sample ID         | Method: Compound                                                  | CAS Number  | Concentration            | MS               | Low                   | High |
| ED045G: Chloride by Discrete Analyser (QCLot: 4429758) - continued |                   |                                                                   |             |                          |                  |                       |      |
| EP2207739-003                                                      | Anonymous         | ED045G: Chloride                                                  | 16887-00-6  | 1000 mg/L                | # Not Determined | 70.0                  | 130  |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4439369)             |                   |                                                                   |             |                          |                  |                       |      |
| EP2207812-003                                                      | 0960_SW298_220623 | EP231X: Perfluorobutane sulfonic acid (PFBS)                      | 375-73-5    | 0.25 µg/L                | 114              | 72.0                  | 130  |
|                                                                    |                   | EP231X: Perfluoropentane sulfonic acid (PFPeS)                    | 2706-91-4   | 0.25 µg/L                | 127              | 71.0                  | 127  |
|                                                                    |                   | EP231X: Perfluorohexane sulfonic acid (PFHxS)                     | 355-46-4    | 0.25 µg/L                | 126              | 68.0                  | 131  |
|                                                                    |                   | EP231X: Perfluoroheptane sulfonic acid (PFHpS)                    | 375-92-8    | 0.25 µg/L                | 134              | 69.0                  | 134  |
|                                                                    |                   | EP231X: Perfluorooctane sulfonic acid (PFOS)                      | 1763-23-1   | 0.25 µg/L                | 130              | 65.0                  | 140  |
|                                                                    |                   | EP231X: Perfluorodecane sulfonic acid (PFDS)                      | 335-77-3    | 0.25 µg/L                | 131              | 53.0                  | 142  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4439369)           |                   |                                                                   |             |                          |                  |                       |      |
| EP2207812-003                                                      | 0960_SW298_220623 | EP231X: Perfluorobutanoic acid (PFBA)                             | 375-22-4    | 1.25 µg/L                | 118              | 73.0                  | 129  |
|                                                                    |                   | EP231X: Perfluoropentanoic acid (PFPeA)                           | 2706-90-3   | 0.25 µg/L                | 122              | 72.0                  | 129  |
|                                                                    |                   | EP231X: Perfluorohexanoic acid (PFHxA)                            | 307-24-4    | 0.25 µg/L                | 119              | 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                | 122              | 71.0                  | 133  |
|                                                                    |                   | EP231X: Perfluorononanoic acid (PFNA)                             | 375-95-1    | 0.25 µg/L                | 120              | 69.0                  | 130  |
|                                                                    |                   | EP231X: Perfluorodecanoic acid (PFDA)                             | 335-76-2    | 0.25 µg/L                | 123              | 71.0                  | 129  |
|                                                                    |                   | EP231X: Perfluoroundecanoic acid (PFUnDA)                         | 2058-94-8   | 0.25 µg/L                | 131              | 69.0                  | 133  |
|                                                                    |                   | EP231X: Perfluorododecanoic acid (PFDoDA)                         | 307-55-1    | 0.25 µg/L                | 116              | 72.0                  | 134  |
|                                                                    |                   | EP231X: Perfluorotridecanoic acid (PFTrDA)                        | 72629-94-8  | 0.25 µg/L                | 129              | 65.0                  | 144  |
|                                                                    |                   | EP231X: Perfluorotetradecanoic acid (PFTeDA)                      | 376-06-7    | 0.625 µg/L               | 127              | 71.0                  | 132  |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4439369)               |                   |                                                                   |             |                          |                  |                       |      |
| EP2207812-003                                                      | 0960_SW298_220623 | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.25 µg/L                | 128              | 67.0                  | 137  |
|                                                                    |                   | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.625 µg/L               | 124              | 68.0                  | 141  |
|                                                                    |                   | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.625 µg/L               | 112              | 62.6                  | 147  |
|                                                                    |                   | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.625 µg/L               | 133              | 66.0                  | 145  |
|                                                                    |                   | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.625 µg/L               | 124              | 57.6                  | 145  |
|                                                                    |                   | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9   | 0.25 µg/L                | 129              | 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: 4439369)        |                   |                                                                   |             |                          |                  |                       |      |
| EP2207812-003                                                      | 0960_SW298_220623 | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.25 µg/L                | 129              | 63.0                  | 143  |
|                                                                    |                   | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 27619-97-2  | 0.25 µg/L                | 129              | 64.0                  | 140  |
|                                                                    |                   | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | 39108-34-4  | 0.25 µg/L                | 122              | 67.0                  | 138  |



Sub-Matrix: WATER

|                                                                         |                   |                                                     |             | Matrix Spike (MS) Report |                  |                       |      |
|-------------------------------------------------------------------------|-------------------|-----------------------------------------------------|-------------|--------------------------|------------------|-----------------------|------|
|                                                                         |                   |                                                     |             | Spike                    | SpikeRecovery(%) | Acceptable Limits (%) |      |
| Laboratory sample ID                                                    | Sample ID         | Method: Compound                                    | CAS Number  | Concentration            | MS               | Low                   | High |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4439369) - continued |                   |                                                     |             |                          |                  |                       |      |
| EP2207812-003                                                           | 0960_SW298_220623 | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS) | 120226-60-0 | 0.25 µg/L                | 111              | 71.4                  | 144  |

## QA/QC Compliance Assessment to assist with Quality Review

Work Order : EP2207812

Page : 1 of 7

Client : STANTEC AUSTRALIA PTY LTD  
Contact :   
Project : WA\_0960\_PFASOMP  
Site : Learmonth SW/OTH -   
Sampler :   
Order number : pfas-omp Learmonth

Laboratory : Environmental Division Perth  
Telephone : +6138549 9609  
Date Samples Received : 27-Jun-2022  
Issue Date : 11-Jul-2022  
No. of samples received : 13  
No. of samples analysed : 13

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

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

### Summary of Outliers

#### Outliers : Quality Control Samples

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

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

#### Outliers : Analysis Holding Time Compliance

- Analysis Holding Time Outliers exist - please see following pages for full details.

#### Outliers : Frequency of Quality Control Samples

- **NO** Quality Control Sample Frequency Outliers exist.

Page : 2 of 7  
 Work Order : EP2207812  
 Client : STANTEC AUSTRALIA PTY LTD  
 Project : WA\_0960\_PFASOMP



## 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                                                                               |
|-------------------------------------------------------------|----------------------|------------------|--------------------------------------------|------------|----------------|--------|---------------------------------------------------------------------------------------|
| <b>Matrix Spike (MS) Recoveries</b>                         |                      |                  |                                            |            |                |        |                                                                                       |
| ED041G: Sulfate (Turbidimetric) as SO <sub>4</sub> 2- by DA | EP2207739--003       | Anonymous        | Sulfate as SO <sub>4</sub> - Turbidimetric | 14808-79-8 | Not Determined | ----   | MS recovery not determined, background level greater than or equal to 4x spike level. |
| ED045G: Chloride by Discrete Analyser                       | EP2207739--003       | Anonymous        | Chloride                                   | 16887-00-6 | Not Determined | ----   | MS recovery not determined, background level greater than or equal to 4x spike level. |

## Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

| Method                                   |                     | Extraction / Preparation |                    |              | Analysis      |                  |              |
|------------------------------------------|---------------------|--------------------------|--------------------|--------------|---------------|------------------|--------------|
| Container / Client Sample ID(s)          |                     | Date extracted           | Due for extraction | Days overdue | Date analysed | Due for analysis | Days overdue |
| <b>ED037P: Alkalinity by PC Titrator</b> |                     |                          |                    |              |               |                  |              |
| <b>Clear Plastic Bottle - Natural</b>    |                     |                          |                    |              |               |                  |              |
| 0960_SW189_220623,                       | 0960_QC126_220623,  | ----                     | ----               | ----         | 08-Jul-2022   | 07-Jul-2022      | 1            |
| 0960_SW298_220623,                       | 0960_OTH107_220623, |                          |                    |              |               |                  |              |
| 0960_SW208_220623,                       | 0960_OTH106_220623, |                          |                    |              |               |                  |              |
| 0960_SW205_220623,                       | 0960_SW301_220623,  |                          |                    |              |               |                  |              |
| 0960_SW207_220623,                       | 0960_SW288_220623,  |                          |                    |              |               |                  |              |
| 0960_OTH134_220623,                      | 0960_OTH132_220623, |                          |                    |              |               |                  |              |
| 0960_SW190_220623                        |                     |                          |                    |              |               |                  |              |

## Analysis Holding Time Compliance

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

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

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

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

Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

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

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 Work Order : EP2207812  
 Client : STANTEC AUSTRALIA PTY LTD  
 Project : WA\_0960\_PFASOMP



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                                                                                                                                                                                                                                                                                                  | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|
| Container / Client Sample ID(s)                                                                                                                                                                                                                                                                                         |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| ED037P: Alkalinity by PC Titrator                                                                                                                                                                                                                                                                                       |             |                          |                    |            |               |                  |            |
| Clear Plastic Bottle - Natural (ED037-P)<br>0960_SW189_220623, 0960_QC126_220623,<br>0960_SW298_220623, 0960_OTH107_220623,<br>0960_SW208_220623, 0960_OTH106_220623,<br>0960_SW205_220623, 0960_SW301_220623,<br>0960_SW207_220623, 0960_SW288_220623,<br>0960_OTH134_220623, 0960_OTH132_220623,<br>0960_SW190_220623 | 23-Jun-2022 | ----                     | ----               | ----       | 08-Jul-2022   | 07-Jul-2022      | ✖          |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA                                                                                                                                                                                                                                                                         |             |                          |                    |            |               |                  |            |
| Clear Plastic Bottle - Natural (ED041G)<br>0960_SW189_220623, 0960_QC126_220623,<br>0960_SW298_220623, 0960_OTH107_220623,<br>0960_SW208_220623, 0960_OTH106_220623,<br>0960_SW205_220623, 0960_SW301_220623,<br>0960_SW207_220623, 0960_SW288_220623,<br>0960_OTH134_220623, 0960_OTH132_220623,<br>0960_SW190_220623  | 23-Jun-2022 | ----                     | ----               | ----       | 06-Jul-2022   | 21-Jul-2022      | ✔          |
| ED045G: Chloride by Discrete Analyser                                                                                                                                                                                                                                                                                   |             |                          |                    |            |               |                  |            |
| Clear Plastic Bottle - Natural (ED045G)<br>0960_SW189_220623, 0960_QC126_220623,<br>0960_SW298_220623, 0960_OTH107_220623,<br>0960_SW208_220623, 0960_OTH106_220623,<br>0960_SW205_220623, 0960_SW301_220623,<br>0960_SW207_220623, 0960_SW288_220623,<br>0960_OTH134_220623, 0960_OTH132_220623,<br>0960_SW190_220623  | 23-Jun-2022 | ----                     | ----               | ----       | 06-Jul-2022   | 21-Jul-2022      | ✔          |
| ED093F: Dissolved Major Cations                                                                                                                                                                                                                                                                                         |             |                          |                    |            |               |                  |            |
| Clear Plastic Bottle - Natural (ED093F)<br>0960_SW189_220623, 0960_QC126_220623,<br>0960_SW298_220623, 0960_OTH107_220623,<br>0960_SW208_220623, 0960_OTH106_220623,<br>0960_SW205_220623, 0960_SW301_220623,<br>0960_SW207_220623, 0960_SW288_220623,<br>0960_OTH134_220623, 0960_OTH132_220623,<br>0960_SW190_220623  | 23-Jun-2022 | ----                     | ----               | ----       | 29-Jun-2022   | 30-Jun-2022      | ✔          |



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                     |                     | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |
|--------------------------------------------|---------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|
| Container / Client Sample ID(s)            |                     |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| EP231A: Perfluoroalkyl Sulfonic Acids      |                     |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                    |                     | 23-Jun-2022 | 05-Jul-2022              | 20-Dec-2022        | ✔          | 06-Jul-2022   | 20-Dec-2022      | ✔          |
| 0960_SW189_220623,                         | 0960_QC126_220623,  |             |                          |                    |            |               |                  |            |
| 0960_SW298_220623,                         | 0960_OTH107_220623, |             |                          |                    |            |               |                  |            |
| 0960_SW208_220623,                         | 0960_OTH106_220623, |             |                          |                    |            |               |                  |            |
| 0960_SW205_220623,                         | 0960_SW301_220623,  |             |                          |                    |            |               |                  |            |
| 0960_SW207_220623,                         | 0960_SW288_220623,  |             |                          |                    |            |               |                  |            |
| 0960_OTH134_220623,                        | 0960_OTH132_220623, |             |                          |                    |            |               |                  |            |
| 0960_SW190_220623                          |                     |             |                          |                    |            |               |                  |            |
| EP231B: Perfluoroalkyl Carboxylic Acids    |                     |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                    |                     | 23-Jun-2022 | 05-Jul-2022              | 20-Dec-2022        | ✔          | 06-Jul-2022   | 20-Dec-2022      | ✔          |
| 0960_SW189_220623,                         | 0960_QC126_220623,  |             |                          |                    |            |               |                  |            |
| 0960_SW298_220623,                         | 0960_OTH107_220623, |             |                          |                    |            |               |                  |            |
| 0960_SW208_220623,                         | 0960_OTH106_220623, |             |                          |                    |            |               |                  |            |
| 0960_SW205_220623,                         | 0960_SW301_220623,  |             |                          |                    |            |               |                  |            |
| 0960_SW207_220623,                         | 0960_SW288_220623,  |             |                          |                    |            |               |                  |            |
| 0960_OTH134_220623,                        | 0960_OTH132_220623, |             |                          |                    |            |               |                  |            |
| 0960_SW190_220623                          |                     |             |                          |                    |            |               |                  |            |
| EP231C: Perfluoroalkyl Sulfonamides        |                     |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                    |                     | 23-Jun-2022 | 05-Jul-2022              | 20-Dec-2022        | ✔          | 06-Jul-2022   | 20-Dec-2022      | ✔          |
| 0960_SW189_220623,                         | 0960_QC126_220623,  |             |                          |                    |            |               |                  |            |
| 0960_SW298_220623,                         | 0960_OTH107_220623, |             |                          |                    |            |               |                  |            |
| 0960_SW208_220623,                         | 0960_OTH106_220623, |             |                          |                    |            |               |                  |            |
| 0960_SW205_220623,                         | 0960_SW301_220623,  |             |                          |                    |            |               |                  |            |
| 0960_SW207_220623,                         | 0960_SW288_220623,  |             |                          |                    |            |               |                  |            |
| 0960_OTH134_220623,                        | 0960_OTH132_220623, |             |                          |                    |            |               |                  |            |
| 0960_SW190_220623                          |                     |             |                          |                    |            |               |                  |            |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids |                     |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                    |                     | 23-Jun-2022 | 05-Jul-2022              | 20-Dec-2022        | ✔          | 06-Jul-2022   | 20-Dec-2022      | ✔          |
| 0960_SW189_220623,                         | 0960_QC126_220623,  |             |                          |                    |            |               |                  |            |
| 0960_SW298_220623,                         | 0960_OTH107_220623, |             |                          |                    |            |               |                  |            |
| 0960_SW208_220623,                         | 0960_OTH106_220623, |             |                          |                    |            |               |                  |            |
| 0960_SW205_220623,                         | 0960_SW301_220623,  |             |                          |                    |            |               |                  |            |
| 0960_SW207_220623,                         | 0960_SW288_220623,  |             |                          |                    |            |               |                  |            |
| 0960_OTH134_220623,                        | 0960_OTH132_220623, |             |                          |                    |            |               |                  |            |
| 0960_SW190_220623                          |                     |             |                          |                    |            |               |                  |            |



Matrix: WATER

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                          | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |                     |
|---------------------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|---------------------|
| Container / Client Sample ID(s) |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |                     |
| EP231P: PFAS Sums               |             |                          |                    |            |               |                  |            |                     |
| HDPE (no PTFE) (EP231X)         | 23-Jun-2022 | 05-Jul-2022              | 20-Dec-2022        | ✔          | 06-Jul-2022   | 20-Dec-2022      | ✔          |                     |
| 0960_SW189_220623,              |             |                          |                    |            |               |                  |            | 0960_QC126_220623,  |
| 0960_SW298_220623,              |             |                          |                    |            |               |                  |            | 0960_OTH107_220623, |
| 0960_SW208_220623,              |             |                          |                    |            |               |                  |            | 0960_OTH106_220623, |
| 0960_SW205_220623,              |             |                          |                    |            |               |                  |            | 0960_SW301_220623,  |
| 0960_SW207_220623,              |             |                          |                    |            |               |                  |            | 0960_SW288_220623,  |
| 0960_OTH134_220623,             |             |                          |                    |            |               |                  |            | 0960_OTH132_220623, |
| 0960_SW190_220623               |             |                          |                    |            |               |                  |            |                     |





## Quality Control Parameter Frequency Compliance

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

Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

| Quality Control Sample Type                            |         | Count |         | Rate (%) |          |            | Quality Control Specification  |
|--------------------------------------------------------|---------|-------|---------|----------|----------|------------|--------------------------------|
| Analytical Methods                                     | Method  | QC    | Regular | Actual   | Expected | Evaluation |                                |
| Laboratory Duplicates (DUP)                            |         |       |         |          |          |            |                                |
| Alkalinity by Auto Titrator                            | ED037-P | 4     | 40      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 2     | 17      | 11.76    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 2     | 19      | 10.53    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Laboratory Control Samples (LCS)                       |         |       |         |          |          |            |                                |
| Alkalinity by Auto Titrator                            | ED037-P | 4     | 40      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 1     | 17      | 5.88     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 19      | 5.26     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Method Blanks (MB)                                     |         |       |         |          |          |            |                                |
| Alkalinity by Auto Titrator                            | ED037-P | 2     | 40      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 1     | 17      | 5.88     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 19      | 5.26     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Matrix Spikes (MS)                                     |         |       |         |          |          |            |                                |
| Chloride by Discrete Analyser                          | ED045G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 19      | 5.26     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |



## Brief Method Summaries

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

| Analytical Methods                                                 | Method       | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------------------|--------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alkalinity by Auto Titrator                                        | ED037-P      | WATER  | In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                                                                                                                                                                                                                |
| Sulfate (Turbidimetric) as SO <sub>4</sub> 2- by Discrete Analyser | ED041G       | WATER  | In house: Referenced to APHA 4500-SO <sub>4</sub> . Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO <sub>4</sub> suspension is measured by a photometer and the SO <sub>4</sub> -2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                         |
| Chloride by Discrete Analyser                                      | ED045G       | WATER  | In house: Referenced to APHA 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm.                                                                                                                                                                                                                                                                                                                                                                |
| Major Cations - Dissolved                                          | ED093F       | WATER  | In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                           |
| Ionic Balance by PCT DA and Turbi SO <sub>4</sub> DA               | * EN055 - PG | WATER  | In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS               | EP231X       | WATER  | In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements. |
| Preparation Methods                                                | Method       | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Solid Phase Extraction (SPE) for PFAS in water                     | ORG72        | WATER  | In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.                                                                                                                                                                                                |



# CHAIN OF CUSTODY

ALS

COC#: 39279

ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: Learmonth SD - MB

ORDER NO: pfas-omp Learmonth

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:

## SAMPLE DETAILS

## ANALYSIS REQUIRED

| SAMPLE | NAME       | DESCRIPTION | DATE / TIME         | MATRIX | TOTAL BOTTLES        | ON HOLD | PFAS Sediments SEDIMENT | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|------------|-------------|---------------------|--------|----------------------|---------|-------------------------|----------------------|------------------------|
| 001    | 0960_SS189 |             | 23/06/2022 07:56 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |
| 002    | 0960_SS298 |             | 23/06/2022 08:47 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |
| 003    | 0960_SD208 |             | 23/06/2022 09:36 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |
| 004    | 0960_QC127 |             | 23/06/2022 09:39 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |
| 005    | 0960_SD205 |             | 23/06/2022 10:19 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |
| 006    | 0960_SS301 |             | 23/06/2022 10:28 AM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |
| 007    | 0960_SD207 |             | 23/06/2022 01:18 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |
| 008    | 0960_SS288 |             | 23/06/2022 02:01 PM | Soil   | ALS: 1<br>Non ALS: 0 | No      | X                       |                      |                        |



# CHAIN OF CUSTODY

COC#: 39279

ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: Learmonth SD - MB

ORDER NO: pfas-omp Learmonth

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:

| SAMPLE | SAMPLE NAME | BOTTLE NAME   | VOLUME | BARCODE        | TYPE | FILTERED | REASON |
|--------|-------------|---------------|--------|----------------|------|----------|--------|
| 001    | 0960_SS189  | HDPE Soil Jar | 200 mL | 00620322036365 | Grey | No       |        |
| 002    | 0960_SS298  | HDPE Soil Jar | 200 mL | 00620322036431 | Grey | No       |        |
| 003    | 0960_SD208  | HDPE Soil Jar | 200 mL | 00620322036402 | Grey | No       |        |
| 004    | 0960_QC127  | HDPE Soil Jar | 200 mL | 00620322036391 | Grey | No       |        |
| 005    | 0960_SD205  | HDPE Soil Jar | 200 mL | 00620322036372 | Grey | No       |        |
| 006    | 0960_SS301  | HDPE Soil Jar | 200 mL | 00620322036415 | Grey | No       |        |
| 007    | 0960_SD207  | HDPE Soil Jar | 200 mL | 00620322036359 | Grey | No       |        |
| 008    | 0960_SS288  | HDPE Soil Jar | 200 mL | 00620322029670 | Grey | No       |        |

Total Bottle Count: ALS: 8, Non ALS: 0

## SAMPLE RECEIPT NOTIFICATION (SRN)

**Work Order : EP2207813**

|                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Client : <b>STANTEC AUSTRALIA PTY LTD</b></p> <p>Contact : [REDACTED]</p> <p>Address : GROUND FLOOR 226 ADELAIDE TERRACE<br/>PERTH 6000</p> <p>E-mail : [REDACTED]@stantec.com</p> <p>Telephone : ----</p> <p>Facsimile : ----</p> <p>Project : WA_0960_PFASOMP</p> <p>Order number : pfas-omp Learmonth</p> <p>C-O-C number : 39279</p> <p>Site : Learmonth SD - [REDACTED]</p> <p>Sampler : [REDACTED]</p> | <p>Laboratory : Environmental Division Perth</p> <p>Contact : [REDACTED]</p> <p>Address : 26 Rigali Way Wangara Western<br/>Australia Australia 6065</p> <p>E-mail : [REDACTED]@alsglobal.com</p> <p>Telephone : +6138549 9609</p> <p>Facsimile : +61-8-9406 1399</p> <p>Page : 1 of 2</p> <p>Quote number : ES2022MWHAUS0002 (SY/139/19 B)</p> <p>QC Level : NEPM 2013 B3 &amp; ALS QC Standard</p> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Dates

|                                                                                                           |                                                                                      |
|-----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <p>Date Samples Received : 27-Jun-2022 11:40</p> <p>Client Requested Due : 08-Jul-2022</p> <p>Date : </p> | <p>Issue Date : 28-Jun-2022</p> <p>Scheduled Reporting Date : <b>08-Jul-2022</b></p> |
|-----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|

### Delivery Details

|                                                                                           |                                                                                                                                |
|-------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| <p>Mode of Delivery : Carrier</p> <p>No. of coolers/boxes : 5</p> <p>Receipt Detail :</p> | <p>Security Seal : Not Available</p> <p>Temperature : 13.4 - Ice present</p> <p>No. of samples received / analysed : 8 / 8</p> |
|-------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|

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

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

- ### Summary of Sample(s) and Requested Analysis

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

| Laboratory sample ID | Sampling date / time | Sample ID         | SOIL - E Moisture | SOIL - E PFAS |
|----------------------|----------------------|-------------------|-------------------|---------------|
| EP2207813-001        | 23-Jun-2022 07:56    | 0960_SS189_220623 | ✓                 | ✓             |
| EP2207813-002        | 23-Jun-2022 08:47    | 0960_SS298_220623 | ✓                 | ✓             |
| EP2207813-003        | 23-Jun-2022 09:36    | 0960_SD208_220623 | ✓                 | ✓             |
| EP2207813-004        | 23-Jun-2022 09:39    | 0960_QC127_220623 | ✓                 | ✓             |
| EP2207813-005        | 23-Jun-2022 10:19    | 0960_SD205_220623 | ✓                 | ✓             |
| EP2207813-006        | 23-Jun-2022 10:28    | 0960_SS301_220623 | ✓                 | ✓             |
| EP2207813-007        | 23-Jun-2022 13:18    | 0960_SD207_220623 | ✓                 | ✓             |
| EP2207813-008        | 23-Jun-2022 14:01    | 0960_SS288_220623 | ✓                 | ✓             |

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

|                         |                                                                |       |                              |
|-------------------------|----------------------------------------------------------------|-------|------------------------------|
| [REDACTED]              | - A4 - AU Tax Invoice (INV)                                    | Email | [REDACTED]@cardno.com.au     |
| <b>DERP LAB REPORTS</b> |                                                                |       |                              |
| [REDACTED]              | - EDI Format - ESDAT (ESDAT)                                   | Email | derp.labreports@esdat.com.au |
| [REDACTED]              | - *AU Certificate of Analysis - NATA (COA)                     | Email | [REDACTED]@stantec.com       |
| [REDACTED]              | - *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)    | Email | [REDACTED]@stantec.com       |
| [REDACTED]              | - *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)            | Email | [REDACTED]@stantec.com       |
| [REDACTED]              | - A4 - AU Sample Receipt Notification - Environmental HT (SRN) | Email | [REDACTED]@stantec.com       |
| [REDACTED]              | - Chain of Custody (CoC) (COC)                                 | Email | [REDACTED]@stantec.com       |
| [REDACTED]              | - EDI Format - ESDAT (ESDAT)                                   | Email | [REDACTED]@stantec.com       |
| [REDACTED]              | - EDI Format - XTab (XTAB)                                     | Email | [REDACTED]@stantec.com       |

## CERTIFICATE OF ANALYSIS

**Work Order** : **EP2207813**  
**Client** : **STANTEC AUSTRALIA PTY LTD**  
**Contact** : [REDACTED]  
**Address** : GROUND FLOOR 226 ADELAIDE TERRACE  
 PERTH 6000  
**Telephone** : ----  
**Project** : WA\_0960\_PFASOMP  
**Order number** : pfas-omp Learmonth  
**C-O-C number** : 39279  
**Sampler** : [REDACTED]  
**Site** : Learmonth SD - MB  
**Quote number** : SY/139/19 B  
**No. of samples received** : 8  
**No. of samples analysed** : 8

**Page** : 1 of 7  
**Laboratory** : Environmental Division Perth  
**Contact** : [REDACTED]  
**Address** : 26 Rigali Way Wangara Western Australia Australia 6065  
**Telephone** : +6138549 9609  
**Date Samples Received** : 27-Jun-2022 11:40  
**Date Analysis Commenced** : 04-Jul-2022  
**Issue Date** : 08-Jul-2022 11:20



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             |
|------------------------------------------------------------------------|------------------|------------------------------------|
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator | Sydney Inorganics, Smithfield, NSW |
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator | Sydney Organics, Smithfield, NSW   |





## 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.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- 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

|                                                    |            |        |       | 0960_SS189_220623 | 0960_SS298_220623 | 0960_SD208_220623 | 0960_QC127_220623 | 0960_SD205_220623 |
|----------------------------------------------------|------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                               |            |        |       | 23-Jun-2022 07:56 | 23-Jun-2022 08:47 | 23-Jun-2022 09:36 | 23-Jun-2022 09:39 | 23-Jun-2022 10:19 |
| Compound                                           | CAS Number | LOR    | Unit  | EP2207813-001     | EP2207813-002     | EP2207813-003     | EP2207813-004     | EP2207813-005     |
|                                                    |            |        |       | Result            | Result            | Result            | Result            | Result            |
| <b>EA055: Moisture Content (Dried @ 105-110°C)</b> |            |        |       |                   |                   |                   |                   |                   |
| Moisture Content                                   | ----       | 0.1    | %     | 17.4              | 16.5              | 30.5              | 22.8              | 18.0              |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>       |            |        |       |                   |                   |                   |                   |                   |
| 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 | 0.0040            | <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           |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>     |            |        |       |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>         |            |        |       |                   |                   |                   |                   |                   |
| 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<br>(Matrix: SOIL)                    |                    |        |       | Sample ID | 0960_SS189_220623 | 0960_SS298_220623 | 0960_SD208_220623 | 0960_QC127_220623 | 0960_SD205_220623 |
|-----------------------------------------------------------|--------------------|--------|-------|-----------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                      |                    |        |       |           | 23-Jun-2022 07:56 | 23-Jun-2022 08:47 | 23-Jun-2022 09:36 | 23-Jun-2022 09:39 | 23-Jun-2022 10:19 |
| Compound                                                  | CAS Number         | LOR    | Unit  |           | EP2207813-001     | EP2207813-002     | EP2207813-003     | EP2207813-004     | EP2207813-005     |
|                                                           |                    |        |       | Result    | Result            | Result            | Result            | Result            | Result            |
| <b>EP231C: Perfluoroalkyl Sulfonamides - Continued</b>    |                    |        |       |           |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>         |                    |        |       |           |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231P: PFAS Sums</b>                                  |                    |        |       |           |                   |                   |                   |                   |                   |
| Sum of PFAS                                               | ----               | 0.0002 | mg/kg | 0.0040    | <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 | 0.0040    | <0.0002           | <0.0002           | <0.0002           | <0.0002           | <0.0002           |
| Sum of PFAS (WA DER List)                                 | ----               | 0.0002 | mg/kg | 0.0040    | <0.0002           | <0.0002           | <0.0002           | <0.0002           | <0.0002           |
| <b>EP231S: PFAS Surrogate</b>                             |                    |        |       |           |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                 | ----               | 0.0002 | %     | 85.5      | 93.5              | 78.5              | 92.5              | 94.0              |                   |
| 13C8-PFOA                                                 | ----               | 0.0002 | %     | 111       | 112               | 110               | 103               | 98.5              |                   |



## Analytical Results

Sub-Matrix: SEDIMENT  
 (Matrix: SOIL)

Sample ID

|                                                    |            |        |       | 0960_SS301_220623 | 0960_SD207_220623 | 0960_SS288_220623 | ----  | ----  |
|----------------------------------------------------|------------|--------|-------|-------------------|-------------------|-------------------|-------|-------|
| Sampling date / time                               |            |        |       | 23-Jun-2022 10:28 | 23-Jun-2022 13:18 | 23-Jun-2022 14:01 | ----  | ----  |
| Compound                                           | CAS Number | LOR    | Unit  | EP2207813-006     | EP2207813-007     | EP2207813-008     | ----- | ----- |
|                                                    |            |        |       | Result            | Result            | Result            | ----  | ----  |
| <b>EA055: Moisture Content (Dried @ 105-110°C)</b> |            |        |       |                   |                   |                   |       |       |
| Moisture Content                                   | ----       | 0.1    | %     | 29.0              | 24.5              | 28.7              | ----  | ----  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>       |            |        |       |                   |                   |                   |       |       |
| 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           | 0.0014            | ----  | ----  |
| Perfluorodecane sulfonic acid (PFDS)               | 335-77-3   | 0.0002 | mg/kg | <0.0002           | <0.0002           | 0.0002            | ----  | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>     |            |        |       |                   |                   |                   |       |       |
| 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           | ----  | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>         |            |        |       |                   |                   |                   |       |       |
| 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

|                                                           |                    |        |       | 0960_SS301_220623 | 0960_SD207_220623 | 0960_SS288_220623 | ----  | ----  |
|-----------------------------------------------------------|--------------------|--------|-------|-------------------|-------------------|-------------------|-------|-------|
| Sampling date / time                                      |                    |        |       | 23-Jun-2022 10:28 | 23-Jun-2022 13:18 | 23-Jun-2022 14:01 | ----  | ----  |
| Compound                                                  | CAS Number         | LOR    | Unit  | EP2207813-006     | EP2207813-007     | EP2207813-008     | ----- | ----- |
|                                                           |                    |        |       | Result            | Result            | Result            | ----  | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides - Continued</b>    |                    |        |       |                   |                   |                   |       |       |
| 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           | ----  | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>         |                    |        |       |                   |                   |                   |       |       |
| 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           | ----  | ----  |
| <b>EP231P: PFAS Sums</b>                                  |                    |        |       |                   |                   |                   |       |       |
| Sum of PFAS                                               | ----               | 0.0002 | mg/kg | <0.0002           | <0.0002           | <b>0.0016</b>     | ----  | ----  |
| Sum of PFHxS and PFOS                                     | 355-46-4/1763-23-1 | 0.0002 | mg/kg | <0.0002           | <0.0002           | <b>0.0014</b>     | ----  | ----  |
| Sum of PFAS (WA DER List)                                 | ----               | 0.0002 | mg/kg | <0.0002           | <0.0002           | <b>0.0014</b>     | ----  | ----  |
| <b>EP231S: PFAS Surrogate</b>                             |                    |        |       |                   |                   |                   |       |       |
| 13C4-PFOS                                                 | ----               | 0.0002 | %     | <b>88.5</b>       | <b>95.5</b>       | <b>89.5</b>       | ----  | ----  |
| 13C8-PFOA                                                 | ----               | 0.0002 | %     | <b>94.5</b>       | <b>99.5</b>       | <b>91.5</b>       | ----  | ----  |



### Surrogate Control Limits

| Sub-Matrix: <b>SEDIMENT</b>   |            | Recovery Limits (%) |      |
|-------------------------------|------------|---------------------|------|
| Compound                      | CAS Number | Low                 | High |
| <b>EP231S: PFAS Surrogate</b> |            |                     |      |
| <b>13C4-PFOS</b>              | ----       | 60                  | 120  |
| <b>13C8-PFOA</b>              | ----       | 60                  | 120  |

### Inter-Laboratory Testing

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

## QUALITY CONTROL REPORT

|                                |                                                           |                                |                                                                 |
|--------------------------------|-----------------------------------------------------------|--------------------------------|-----------------------------------------------------------------|
| <b>Work Order</b>              | <b>: EP2207813</b>                                        | <b>Page</b>                    | <b>: 1 of 7</b>                                                 |
| <b>Client</b>                  | <b>: STANTEC AUSTRALIA PTY LTD</b>                        | <b>Laboratory</b>              | <b>: Environmental Division Perth</b>                           |
| <b>Contact</b>                 | <b>: [REDACTED]</b>                                       | <b>Contact</b>                 | <b>: [REDACTED]</b>                                             |
| <b>Address</b>                 | <b>: GROUND FLOOR 226 ADELAIDE TERRACE<br/>PERTH 6000</b> | <b>Address</b>                 | <b>: 26 Rigali Way Wangara Western Australia Australia 6065</b> |
| <b>Telephone</b>               | <b>: ----</b>                                             | <b>Telephone</b>               | <b>: +6138549 9609</b>                                          |
| <b>Project</b>                 | <b>: WA_0960_PFASOMP</b>                                  | <b>Date Samples Received</b>   | <b>: 27-Jun-2022</b>                                            |
| <b>Order number</b>            | <b>: pfas-omp Learmonth</b>                               | <b>Date Analysis Commenced</b> | <b>: 04-Jul-2022</b>                                            |
| <b>C-O-C number</b>            | <b>: 39279</b>                                            | <b>Issue Date</b>              | <b>: 08-Jul-2022</b>                                            |
| <b>Sampler</b>                 | <b>: [REDACTED]</b>                                       |                                |                                                                 |
| <b>Site</b>                    | <b>: Learmonth SD - [REDACTED]</b>                        |                                |                                                                 |
| <b>Quote number</b>            | <b>: SY/139/19 B</b>                                      |                                |                                                                 |
| <b>No. of samples received</b> | <b>: 8</b>                                                |                                |                                                                 |
| <b>No. of samples analysed</b> | <b>: 8</b>                                                |                                |                                                                 |



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]  | LCMS Coordinator | Sydney Inorganics, Smithfield, NSW |
| [REDACTED]  | LCMS Coordinator | Sydney Organics, Smithfield, NSW   |





## 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: 4437285) |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2207733-002                                                 | Anonymous         | EA055: Moisture Content                        | ----       | 0.1                               | %     | 13.3            | 13.0             | 2.2     | 0% - 20%           |
| EP2207738-002                                                 | Anonymous         | EA055: Moisture Content                        | ----       | 0.1                               | %     | 29.0            | 29.5             | 1.9     | 0% - 20%           |
| EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4437286) |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2207813-006                                                 | 0960_SS301_220623 | EA055: Moisture Content                        | ----       | 0.1                               | %     | 29.0            | 32.7             | 12.0    | 0% - 20%           |
| EP2207815-009                                                 | Anonymous         | EA055: Moisture Content                        | ----       | 0.1                               | %     | 27.3            | 31.2             | 13.6    | 0% - 20%           |
| EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4443051)       |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2207738-001                                                 | Anonymous         | EP231X: Perfluorobutane sulfonic acid (PFBS)   | 375-73-5   | 0.0002                            | mg/kg | 0.0003          | 0.0003           | 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           | 0.0     | 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 | ----            | 0.0020           | 24.2    | No Limit           |
|                                                               |                   | EP231X: Perfluorodecane sulfonic acid (PFDS)   | 335-77-3   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
| EP2207813-006                                                 | 0960_SS301_220623 | 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: 4443051)     |                   |                                                |            |                                   |       |                 |                  |         |                    |
| EP2207738-001                                                 | 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 | 0.0021          | 0.0024           | 10.9    | 0% - 50%           |
|                                                               |                   | EP231X: Perfluoroheptanoic acid (PFHpA)        | 375-85-9   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                               |                   | EP231X: Perfluorooctanoic acid (PFOA)          | 335-67-1   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |



| Sub-Matrix: SOIL                                                      |                   |                                                                   |            | Laboratory Duplicate (DUP) Report |       |                 |                  |         |                    |
|-----------------------------------------------------------------------|-------------------|-------------------------------------------------------------------|------------|-----------------------------------|-------|-----------------|------------------|---------|--------------------|
| Laboratory sample ID                                                  | Sample ID         | Method: Compound                                                  | CAS Number | LOR                               | Unit  | Original Result | Duplicate Result | RPD (%) | Acceptable RPD (%) |
| EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4443051) - continued |                   |                                                                   |            |                                   |       |                 |                  |         |                    |
| EP2207738-001                                                         | Anonymous         | EP231X: Perfluorononanoic acid (PFNA)                             | 375-95-1   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                       |                   | EP231X: Perfluorodecanoic acid (PFDA)                             | 335-76-2   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                       |                   | EP231X: Perfluoroundecanoic acid (PFUnDA)                         | 2058-94-8  | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                       |                   | EP231X: Perfluorododecanoic acid (PFDoDA)                         | 307-55-1   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                       |                   | EP231X: Perfluorotridecanoic acid (PFTrDA)                        | 72629-94-8 | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                       |                   | EP231X: Perfluorotetradecanoic acid (PFTeDA)                      | 376-06-7   | 0.0005                            | mg/kg | <0.0005         | <0.0005          | 0.0     | No Limit           |
|                                                                       |                   | EP231X: Perfluorobutanoic acid (PFBA)                             | 375-22-4   | 0.001                             | mg/kg | <0.001          | <0.001           | 0.0     | No Limit           |
| EP2207813-006                                                         | 0960_SS301_220623 | 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: 4443051)             |            |                                   |       |                 |                  |         |                    |
| EP2207738-001                                                         | 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           |
| EP2207813-006                                                         | 0960_SS301_220623 | 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           |

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 Work Order : EP2207813  
 Client : STANTEC AUSTRALIA PTY LTD  
 Project : WA\_0960\_PFASOMP



| Sub-Matrix: <b>SOIL</b>                                           |                   |                                                              |             | 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: 4443051) - continued |                   |                                                              |             |                                   |       |                 |                  |         |                    |
| EP2207813-006                                                     | 0960_SS301_220623 | 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: 4443051)      |                   |                                                              |             |                                   |       |                 |                  |         |                    |
| EP2207738-001                                                     | 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           |
| EP2207813-006                                                     | 0960_SS301_220623 | 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           |



## 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**

| Sub-Matrix: SOIL                                                  |             |        |       | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |     |
|-------------------------------------------------------------------|-------------|--------|-------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|-----|
|                                                                   |             |        |       |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |     |
| Method: Compound                                                  | CAS Number  | LOR    | Unit  | Result                      |                                       |                           |                                   |     |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4443051)            |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: Perfluorobutane sulfonic acid (PFBS)                      | 375-73-5    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 96.0                      | 72.0                              | 128 |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)                    | 2706-91-4   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 105                       | 73.0                              | 123 |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)                     | 355-46-4    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 100                       | 67.0                              | 130 |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)                    | 375-92-8    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 104                       | 70.0                              | 132 |
| EP231X: Perfluorooctane sulfonic acid (PFOS)                      | 1763-23-1   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 106                       | 68.0                              | 136 |
| EP231X: Perfluorodecane sulfonic acid (PFDS)                      | 335-77-3    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 117                       | 59.0                              | 134 |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4443051)          |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: Perfluorobutanoic acid (PFBA)                             | 375-22-4    | 0.001  | mg/kg | <0.001                      | 0.00625 mg/kg                         | 90.2                      | 71.0                              | 135 |
| EP231X: Perfluoropentanoic acid (PFPeA)                           | 2706-90-3   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 104                       | 69.0                              | 132 |
| EP231X: Perfluorohexanoic acid (PFHxA)                            | 307-24-4    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 106                       | 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                         | 111                       | 69.0                              | 133 |
| EP231X: Perfluorononanoic acid (PFNA)                             | 375-95-1    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 112                       | 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                         | 104                       | 64.0                              | 136 |
| EP231X: Perfluorododecanoic acid (PFDoDA)                         | 307-55-1    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 108                       | 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                         | 97.8                      | 69.0                              | 133 |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4443051)              |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 119                       | 67.0                              | 137 |
| EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 109                       | 71.6                              | 129 |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 96.6                      | 69.8                              | 131 |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 117                       | 68.7                              | 130 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 99.4                      | 65.1                              | 134 |
| 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                         | 105                       | 61.0                              | 139 |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4443051)       |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.0005 | mg/kg | <0.0005                     | 0.00125 mg/kg                         | 104                       | 62.0                              | 145 |
| EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 27619-97-2  | 0.0005 | mg/kg | <0.0005                     | 0.00125 mg/kg                         | 108                       | 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                         | 106                       | 65.0                              | 137 |



| Sub-Matrix: SOIL                                                        |  |             |        | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |               |                        |                           |                              |
|-------------------------------------------------------------------------|--|-------------|--------|-----------------------------|---------------------------------------|---------------|------------------------|---------------------------|------------------------------|
| Method: Compound                                                        |  | CAS Number  | LOR    |                             | Unit                                  | Result        | Spike<br>Concentration | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4443051) - continued |  |             |        |                             |                                       |               |                        |                           |                              |
| EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)                     |  | 120226-60-0 | 0.0005 | mg/kg                       | <0.0005                               | 0.00125 mg/kg | 106                    | 69.2                      | 143                          |

## 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                                         |           |                                                                   |            | 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: 4443051)   |           |                                                                   |            |                          |                  |                       |      |
| EP2207738-001                                            | Anonymous | EP231X: Perfluorobutane sulfonic acid (PFBS)                      | 375-73-5   | 0.00125 mg/kg            | 103              | 72.0                  | 128  |
|                                                          |           | EP231X: Perfluoropentane sulfonic acid (PFPeS)                    | 2706-91-4  | 0.00125 mg/kg            | 104              | 73.0                  | 123  |
|                                                          |           | EP231X: Perfluorohexane sulfonic acid (PFHxS)                     | 355-46-4   | 0.00125 mg/kg            | 107              | 67.0                  | 130  |
|                                                          |           | EP231X: Perfluoroheptane sulfonic acid (PFHpS)                    | 375-92-8   | 0.00125 mg/kg            | 106              | 70.0                  | 132  |
|                                                          |           | EP231X: Perfluorooctane sulfonic acid (PFOS)                      | 1763-23-1  | 0.00125 mg/kg            | 102              | 68.0                  | 136  |
|                                                          |           | EP231X: Perfluorodecane sulfonic acid (PFDS)                      | 335-77-3   | 0.00125 mg/kg            | 97.2             | 59.0                  | 134  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4443051) |           |                                                                   |            |                          |                  |                       |      |
| EP2207738-001                                            | Anonymous | 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            | 108              | 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            | 97.2             | 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            | 116              | 72.0                  | 129  |
|                                                          |           | EP231X: Perfluorodecanoic acid (PFDA)                             | 335-76-2   | 0.00125 mg/kg            | 108              | 69.0                  | 133  |
|                                                          |           | EP231X: Perfluoroundecanoic acid (PFUnDA)                         | 2058-94-8  | 0.00125 mg/kg            | 97.2             | 64.0                  | 136  |
|                                                          |           | EP231X: Perfluorododecanoic acid (PFDoDA)                         | 307-55-1   | 0.00125 mg/kg            | 117              | 69.0                  | 135  |
|                                                          |           | EP231X: Perfluorotridecanoic acid (PFTTrDA)                       | 72629-94-8 | 0.00125 mg/kg            | 102              | 66.0                  | 139  |
|                                                          |           | EP231X: Perfluorotetradecanoic acid (PFTeDA)                      | 376-06-7   | 0.00312 mg/kg            | 95.7             | 69.0                  | 133  |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4443051)     |           |                                                                   |            |                          |                  |                       |      |
| EP2207738-001                                            | Anonymous | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6   | 0.00125 mg/kg            | 121              | 67.0                  | 137  |
|                                                          |           | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8 | 0.00312 mg/kg            | 110              | 71.6                  | 129  |
|                                                          |           | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2  | 0.00312 mg/kg            | 109              | 69.8                  | 131  |
|                                                          |           | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7 | 0.00312 mg/kg            | 120              | 68.7                  | 130  |
|                                                          |           | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2  | 0.00312 mg/kg            | 101              | 65.1                  | 134  |
|                                                          |           | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9  | 0.00125 mg/kg            | 111              | 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: 4443051) - continued |           |                                                                  |             |                          |                  |                       |      |
| EP2207738-001                                                    | Anonymous | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA) | 2991-50-6   | 0.00125 mg/kg            | 101              | 61.0                  | 139  |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4443051)      |           |                                                                  |             |                          |                  |                       |      |
| EP2207738-001                                                    | Anonymous | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                | 757124-72-4 | 0.00125 mg/kg            | 97.2             | 62.0                  | 145  |
|                                                                  |           | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                | 27619-97-2  | 0.00125 mg/kg            | 113              | 64.0                  | 140  |
|                                                                  |           | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                | 39108-34-4  | 0.00125 mg/kg            | 113              | 65.0                  | 137  |
|                                                                  |           | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)              | 120226-60-0 | 0.00125 mg/kg            | 98.4             | 69.2                  | 143  |

## QA/QC Compliance Assessment to assist with Quality Review

|              |                             |                         |                                |
|--------------|-----------------------------|-------------------------|--------------------------------|
| Work Order   | : EP2207813                 | Page                    | : 1 of 5                       |
| Client       | : STANTEC AUSTRALIA PTY LTD | Laboratory              | : Environmental Division Perth |
| Contact      | : [REDACTED]                | Telephone               | : +6138549 9609                |
| Project      | : WA_0960_PFASOMP           | Date Samples Received   | : 27-Jun-2022                  |
| Site         | : Learmonth SD - [REDACTED] | Issue Date              | : 08-Jul-2022                  |
| Sampler      | : [REDACTED]                | No. of samples received | : 8                            |
| Order number | : pfas-omp Learmonth        | No. of samples analysed | : 8                            |

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

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

### Summary of Outliers

#### Outliers : Quality Control Samples

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

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

#### Outliers : Analysis Holding Time Compliance

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

#### Outliers : Frequency of Quality Control Samples

- **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                                                                                                         | Sample Date                                                                         | Extraction / Preparation |                    |             | Analysis      |                  |             |   |
|----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------|--------------------|-------------|---------------|------------------|-------------|---|
| Container / Client Sample ID(s)                                                                                |                                                                                     | Date extracted           | Due for extraction | Evaluation  | Date analysed | Due for analysis | Evaluation  |   |
| EA055: Moisture Content (Dried @ 105-110°C)                                                                    |                                                                                     |                          |                    |             |               |                  |             |   |
| HDPE Soil Jar (EA055)<br>0960_SS189_220623,<br>0960_SD208_220623,<br>0960_SD205_220623,<br>0960_SD207_220623,  | 0960_SS298_220623,<br>0960_QC127_220623,<br>0960_SS301_220623,<br>0960_SS288_220623 | 23-Jun-2022              | ----               | ----        | ----          | 04-Jul-2022      | 07-Jul-2022 | ✓ |
| EP231A: Perfluoroalkyl Sulfonic Acids                                                                          |                                                                                     |                          |                    |             |               |                  |             |   |
| HDPE Soil Jar (EP231X)<br>0960_SS189_220623,<br>0960_SD208_220623,<br>0960_SD205_220623,<br>0960_SD207_220623, | 0960_SS298_220623,<br>0960_QC127_220623,<br>0960_SS301_220623,<br>0960_SS288_220623 | 23-Jun-2022              | 06-Jul-2022        | 20-Dec-2022 | ✓             | 07-Jul-2022      | 15-Aug-2022 | ✓ |
| EP231B: Perfluoroalkyl Carboxylic Acids                                                                        |                                                                                     |                          |                    |             |               |                  |             |   |
| HDPE Soil Jar (EP231X)<br>0960_SS189_220623,<br>0960_SD208_220623,<br>0960_SD205_220623,<br>0960_SD207_220623, | 0960_SS298_220623,<br>0960_QC127_220623,<br>0960_SS301_220623,<br>0960_SS288_220623 | 23-Jun-2022              | 06-Jul-2022        | 20-Dec-2022 | ✓             | 07-Jul-2022      | 15-Aug-2022 | ✓ |
| EP231C: Perfluoroalkyl Sulfonamides                                                                            |                                                                                     |                          |                    |             |               |                  |             |   |
| HDPE Soil Jar (EP231X)<br>0960_SS189_220623,<br>0960_SD208_220623,<br>0960_SD205_220623,<br>0960_SD207_220623, | 0960_SS298_220623,<br>0960_QC127_220623,<br>0960_SS301_220623,<br>0960_SS288_220623 | 23-Jun-2022              | 06-Jul-2022        | 20-Dec-2022 | ✓             | 07-Jul-2022      | 15-Aug-2022 | ✓ |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids                                                                     |                                                                                     |                          |                    |             |               |                  |             |   |
| HDPE Soil Jar (EP231X)<br>0960_SS189_220623,<br>0960_SD208_220623,<br>0960_SD205_220623,<br>0960_SD207_220623, | 0960_SS298_220623,<br>0960_QC127_220623,<br>0960_SS301_220623,<br>0960_SS288_220623 | 23-Jun-2022              | 06-Jul-2022        | 20-Dec-2022 | ✓             | 07-Jul-2022      | 15-Aug-2022 | ✓ |



Matrix: SOIL

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                          | Sample Date        | Extraction / Preparation |                    |             | Analysis      |                  |             |   |
|---------------------------------|--------------------|--------------------------|--------------------|-------------|---------------|------------------|-------------|---|
| Container / Client Sample ID(s) |                    | Date extracted           | Due for extraction | Evaluation  | Date analysed | Due for analysis | Evaluation  |   |
| EP231P: PFAS Sums               |                    |                          |                    |             |               |                  |             |   |
| HDPE Soil Jar (EP231X)          |                    |                          |                    |             |               |                  |             |   |
| 0960_SS189_220623,              | 0960_SS298_220623, | 23-Jun-2022              | 06-Jul-2022        | 20-Dec-2022 | ✔             | 07-Jul-2022      | 15-Aug-2022 | ✔ |
| 0960_SD208_220623,              | 0960_QC127_220623, |                          |                    |             |               |                  |             |   |
| 0960_SD205_220623,              | 0960_SS301_220623, |                          |                    |             |               |                  |             |   |
| 0960_SD207_220623,              | 0960_SS288_220623  |                          |                    |             |               |                  |             |   |



## Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

| Quality Control Sample Type                          |        | Count |         | Rate (%) |          |            | Quality Control Specification  |
|------------------------------------------------------|--------|-------|---------|----------|----------|------------|--------------------------------|
| Analytical Methods                                   | Method | QC    | Regular | Actual   | Expected | Evaluation |                                |
| Laboratory Duplicates (DUP)                          |        |       |         |          |          |            |                                |
| Moisture Content                                     | EA055  | 4     | 40      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Laboratory Control Samples (LCS)                     |        |       |         |          |          |            |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Method Blanks (MB)                                   |        |       |         |          |          |            |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Matrix Spikes (MS)                                   |        |       |         |          |          |            |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |



## Brief Method Summaries

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

| Analytical Methods                                   | Method | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------------------------------------------|--------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Moisture Content                                     | EA055  | SOIL   | In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | SOIL   | In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements. |
| Preparation Methods                                  | Method | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| QuEChERS Extraction of Solids                        | ORG71  | SOIL   | In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.                                                                                                                                                                                                                                   |



# CHAIN OF CUSTODY

COC#: 39283

ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: Learmonth GW - SC

ORDER NO: pfas-omp Learmonth

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:

## SAMPLE DETAILS

## ANALYSIS REQUIRED

| SAMPLE | NAME             | DESCRIPTION        | DATE / TIME         | MATRIX | TOTAL BOTTLES        | ON HOLD | Ground Waters WATER | ALTERNATIVE ANALYSIS | ADDITIONAL INFORMATION |
|--------|------------------|--------------------|---------------------|--------|----------------------|---------|---------------------|----------------------|------------------------|
| 001    | 0960_MW178_2-2.5 | 2 x lab qc bottles | 23/06/2022 08:27 AM | Water  | ALS: 5<br>Non ALS: 0 | No      | Partial 4/8         |                      |                        |
| 002    | 0960_MW176_1.5-2 |                    | 23/06/2022 09:21 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |                      |                        |
| 003    | 0960_MW177_1.5-2 |                    | 23/06/2022 09:37 AM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |                      |                        |
| 004    | 0960_MW175_4-4.5 |                    | 23/06/2022 12:41 PM | Water  | ALS: 3<br>Non ALS: 0 | No      | Partial 4/8         |                      |                        |

**CHAIN OF CUSTODY**

COC#: 39283

ALS Laboratory: EP Perth

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFASOMP

SITE: Learmonth GW - SC

ORDER NO: pfas-omp Learmonth

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:

| SAMPLE | SAMPLE NAME      | PARTIAL ANALYSIS GROUP NAME | MATRIX | SELECTED ANALYSIS NAME                                                                                                                                                                                      |
|--------|------------------|-----------------------------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 001    | 0960_MW178_2-2.5 | Ground Waters WATER         | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 002    | 0960_MW176_1.5-2 | Ground Waters WATER         | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 003    | 0960_MW177_1.5-2 | Ground Waters WATER         | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |
| 004    | 0960_MW175_4-4.5 | Ground Waters WATER         | Water  | - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)<br>- NT-01 Major Cations (Ca, Mg, Na, K)<br>- EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F<br>- EP231X PFAS - Full Suite (28 analytes) |



# CHAIN OF CUSTODY

COC#: 39283

ALS Laboratory: EP Perth

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

DATE TIME:

DATE TIME:

DATE TIME:

DATE TIME:

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA\_0960\_PFSOMP

SITE: Learmonth GW - SC

ORDER NO: pfas-omp Learmonth

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:

| SAMPLE | SAMPLE NAME      | BOTTLE NAME                    | VOLUME | BARCODE        | TYPE  | FILTERED | REASON |
|--------|------------------|--------------------------------|--------|----------------|-------|----------|--------|
| 001    | 0960_MW178_2-2.5 | Clear Plastic Bottle - Natural | 500 mL | 00070621089890 | Green | No       |        |
| 001    | 0960_MW178_2-2.5 | HDPE (no PTFE)                 | 20 mL  | 00350821023873 | Grey  | No       |        |
| 001    | 0960_MW178_2-2.5 | HDPE (no PTFE)                 | 20 mL  | 00350821023994 | Grey  | No       |        |
| 001    | 0960_MW178_2-2.5 | HDPE (no PTFE)                 | 20 mL  | 00352101058206 | Grey  | No       |        |
| 001    | 0960_MW178_2-2.5 | HDPE (no PTFE)                 | 20 mL  | 00350019177401 | Grey  | No       |        |
| 002    | 0960_MW176_1.5-2 | HDPE (no PTFE)                 | 20 mL  | 00350821023749 | Grey  | No       |        |
| 002    | 0960_MW176_1.5-2 | HDPE (no PTFE)                 | 20 mL  | 00350821023991 | Grey  | No       |        |
| 002    | 0960_MW176_1.5-2 | Clear Plastic Bottle - Natural | 500 mL | 00070621089722 | Green | No       |        |
| 003    | 0960_MW177_1.5-2 | Clear Plastic Bottle - Natural | 500 mL | 00070621089827 | Green | No       |        |
| 003    | 0960_MW177_1.5-2 | HDPE (no PTFE)                 | 20 mL  | 00350821023847 | Grey  | No       |        |
| 003    | 0960_MW177_1.5-2 | HDPE (no PTFE)                 | 20 mL  | 00350821023856 | Grey  | No       |        |
| 004    | 0960_MW175_4-4.5 | HDPE (no PTFE)                 | 20 mL  | 00350821043201 | Grey  | No       |        |
| 004    | 0960_MW175_4-4.5 | HDPE (no PTFE)                 | 20 mL  | 00350821023818 | Grey  | No       |        |
| 004    | 0960_MW175_4-4.5 | Clear Plastic Bottle - Natural | 500 mL | 00070621089630 | Green | No       |        |

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



**SAMPLE RECEIPT NOTIFICATION (SRN)****Work Order : EP2207814**

Client : **STANTEC AUSTRALIA PTY LTD**  
Contact : [REDACTED]  
Address : GROUND FLOOR 226 ADELAIDE  
TERRACE  
PERTH 6000

Laboratory : Environmental Division Perth  
Contact : [REDACTED]  
Address : 26 Rigali Way Wangara Western  
Australia Australia 6065

E-mail : [REDACTED]@stantec.com  
Telephone : ----  
Facsimile : ----

E-mail : [REDACTED]@alsglobal.com  
Telephone : +6138549 9609  
Facsimile : +61-8-9406 1399

Project : WA\_0960\_PFASOMP  
Order number : pfas-omp Learmonth  
C-O-C number : 39283  
Site : Learmonth GW - [REDACTED]  
Sampler : [REDACTED]

Page : 1 of 2  
Quote number : ES2022MWHAUS0002 (SY/139/19 B)  
QC Level : NEPM 2013 B3 & ALS QC Standard

**Dates**

Date Samples Received : 27-Jun-2022 11:40  
Client Requested Due : 08-Jul-2022  
Date

Issue Date : 28-Jun-2022  
Scheduled Reporting Date : **08-Jul-2022**

**Delivery Details**

Mode of Delivery : Carrier  
No. of coolers/boxes : 5  
Receipt Detail :

Security Seal : Not Available  
Temperature : 13.4 - 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
- EP231X conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepancies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

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

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

| Laboratory sample ID          | Sampling date / time | Sample ID               | WATER - Ionic Bar | WATER - PFAS - | WATER - Major C | WATER - Major A |
|-------------------------------|----------------------|-------------------------|-------------------|----------------|-----------------|-----------------|
| <a href="#">EP2207814-001</a> | 23-Jun-2022 08:27    | 0960_MW178_2-2.5_220... | ✓                 | ✓              | ✓               | ✓               |
| <a href="#">EP2207814-002</a> | 23-Jun-2022 09:21    | 0960_MW176_1.5-2_220... | ✓                 | ✓              | ✓               | ✓               |
| <a href="#">EP2207814-003</a> | 23-Jun-2022 09:37    | 0960_MW177_1.5-2_220... | ✓                 | ✓              | ✓               | ✓               |
| <a href="#">EP2207814-004</a> | 23-Jun-2022 12:41    | 0960_MW175_4-4.5_220... | ✓                 | ✓              | ✓               | ✓               |

|                                                                |       |                              |
|----------------------------------------------------------------|-------|------------------------------|
| - A4 - AU Tax Invoice (INV)                                    | Email | cardno.com.au                |
| <b>DERP LAB REPORTS</b>                                        |       |                              |
| - EDI Format - ESDAT (ESDAT)                                   | Email | derp.labreports@esdat.com.au |
| - *AU Certificate of Analysis - NATA (COA)                     | Email | stantec.com                  |
| - *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)    | Email | stantec.com                  |
| - *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)            | Email | stantec.com                  |
| - A4 - AU Sample Receipt Notification - Environmental HT (SRN) | Email | stantec.com                  |
| - Chain of Custody (CoC) (COC)                                 | Email | stantec.com                  |
| - EDI Format - ESDAT (ESDAT)                                   | Email | stantec.com                  |
| - EDI Format - XTab (XTAB)                                     | Email | stantec.com                  |

## CERTIFICATE OF ANALYSIS

**Work Order** : **EP2207814**  
**Client** : **STANTEC AUSTRALIA PTY LTD**  
**Contact** : [REDACTED]  
**Address** : GROUND FLOOR 226 ADELAIDE TERRACE  
 PERTH 6000  
**Telephone** : ----  
**Project** : WA\_0960\_PFASOMP  
**Order number** : pfas-omp Learmonth  
**C-O-C number** : 39283  
**Sampler** : [REDACTED]  
**Site** : Learmonth GW - SC  
**Quote number** : SY/139/19 B  
**No. of samples received** : 4  
**No. of samples analysed** : 4

**Page** : 1 of 6  
**Laboratory** : Environmental Division Perth  
**Contact** : [REDACTED]  
**Address** : 26 Rigali Way Wangara Western Australia Australia 6065  
**Telephone** : +6138549 9609  
**Date Samples Received** : 27-Jun-2022 11:40  
**Date Analysis Commenced** : 28-Jun-2022  
**Issue Date** : 08-Jul-2022 13:27



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                       |
|------------------------------------------------------------------------|----------------------------|----------------------------------------------|
| <span style="background-color: black; color: black;">[REDACTED]</span> | Laboratory Manager (Perth) | Perth Inorganics, Wangara, Western Australia |
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator           | Sydney Organics, Smithfield, NSW             |



## 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 conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- 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.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, 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: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                        |             |      |       | 0960_MW178_2-2.5_2<br>20623 | 0960_MW176_1.5-2_2<br>20623 | 0960_MW177_1.5-2_2<br>20623 | 0960_MW175_4-4.5_2<br>20623 | ----  |
|--------------------------------------------------------|-------------|------|-------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-------|
| Sampling date / time                                   |             |      |       | 23-Jun-2022 08:27           | 23-Jun-2022 09:21           | 23-Jun-2022 09:37           | 23-Jun-2022 12:41           | ----  |
| Compound                                               | CAS Number  | LOR  | Unit  | EP2207814-001               | EP2207814-002               | EP2207814-003               | EP2207814-004               | ----- |
|                                                        |             |      |       | Result                      | Result                      | Result                      | Result                      | ----  |
| <b>ED037P: Alkalinity by PC Titrator</b>               |             |      |       |                             |                             |                             |                             |       |
| Hydroxide Alkalinity as CaCO3                          | DMO-210-001 | 1    | mg/L  | <1                          | <1                          | <1                          | <1                          | ----  |
| Carbonate Alkalinity as CaCO3                          | 3812-32-6   | 1    | mg/L  | <1                          | <1                          | <1                          | <1                          | ----  |
| Bicarbonate Alkalinity as CaCO3                        | 71-52-3     | 1    | mg/L  | 147                         | 224                         | 162                         | 431                         | ----  |
| Total Alkalinity as CaCO3                              | ----        | 1    | mg/L  | 147                         | 224                         | 162                         | 431                         | ----  |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b> |             |      |       |                             |                             |                             |                             |       |
| Sulfate as SO4 - Turbidimetric                         | 14808-79-8  | 1    | mg/L  | 6010                        | 3120                        | 4610                        | 46                          | ----  |
| <b>ED045G: Chloride by Discrete Analyser</b>           |             |      |       |                             |                             |                             |                             |       |
| Chloride                                               | 16887-00-6  | 1    | mg/L  | 41600                       | 18400                       | 39800                       | 864                         | ----  |
| <b>ED093F: Dissolved Major Cations</b>                 |             |      |       |                             |                             |                             |                             |       |
| Calcium                                                | 7440-70-2   | 1    | mg/L  | 1240                        | 653                         | 982                         | 47                          | ----  |
| Magnesium                                              | 7439-95-4   | 1    | mg/L  | 2960                        | 1540                        | 2840                        | 151                         | ----  |
| Sodium                                                 | 7440-23-5   | 1    | mg/L  | 23200                       | 10900                       | 21500                       | 321                         | ----  |
| Potassium                                              | 7440-09-7   | 1    | mg/L  | 1100                        | 647                         | 1030                        | 39                          | ----  |
| <b>EN055: Ionic Balance</b>                            |             |      |       |                             |                             |                             |                             |       |
| ∅ Total Anions                                         | ----        | 0.01 | meq/L | 1300                        | 588                         | 1220                        | 33.9                        | ----  |
| ∅ Total Cations                                        | ----        | 0.01 | meq/L | 1340                        | 650                         | 1240                        | 29.7                        | ----  |
| ∅ Ionic Balance                                        | ----        | 0.01 | %     | 1.56                        | 4.97                        | 0.91                        | 6.61                        | ----  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>           |             |      |       |                             |                             |                             |                             |       |
| Perfluorobutane sulfonic acid (PFBS)                   | 375-73-5    | 0.02 | µg/L  | <0.02                       | <0.02                       | <0.02                       | <0.02                       | ----  |
| Perfluoropentane sulfonic acid (PFPeS)                 | 2706-91-4   | 0.02 | µg/L  | <0.02                       | <0.02                       | <0.02                       | <0.02                       | ----  |
| Perfluorohexane sulfonic acid (PFHxS)                  | 355-46-4    | 0.01 | µg/L  | <0.01                       | <0.01                       | <0.01                       | <0.01                       | ----  |
| Perfluoroheptane sulfonic acid (PFHpS)                 | 375-92-8    | 0.02 | µg/L  | <0.02                       | <0.02                       | <0.02                       | <0.02                       | ----  |
| Perfluorooctane sulfonic acid (PFOS)                   | 1763-23-1   | 0.01 | µg/L  | <0.01                       | <0.01                       | <0.01                       | <0.01                       | ----  |
| Perfluorodecane sulfonic acid (PFDS)                   | 335-77-3    | 0.02 | µg/L  | <0.02                       | <0.02                       | <0.02                       | <0.02                       | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>         |             |      |       |                             |                             |                             |                             |       |
| 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                       | ----  |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_MW178_2-2.5_2<br>20623 | 0960_MW176_1.5-2_2<br>20623 | 0960_MW177_1.5-2_2<br>20623 | 0960_MW175_4-4.5_2<br>20623 | ----  |
|------------------------------------------------------------|-------------|------|------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-------|
| Sampling date / time                                       |             |      |      | 23-Jun-2022 08:27           | 23-Jun-2022 09:21           | 23-Jun-2022 09:37           | 23-Jun-2022 12:41           | ----  |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2207814-001               | EP2207814-002               | EP2207814-003               | EP2207814-004               | ----- |
|                                                            |             |      |      | Result                      | Result                      | Result                      | Result                      | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                             |                             |                             |                             |       |
| 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 (PFTTrDA)                        | 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                       | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                             |                             |                             |                             |       |
| 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                       | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                             |                             |                             |                             |       |
| 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                       | ----  |



## Analytical Results

Sub-Matrix: GROUNDWATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_MW178_2-2.5_2<br>20623 | 0960_MW176_1.5-2_2<br>20623 | 0960_MW177_1.5-2_2<br>20623 | 0960_MW175_4-4.5_2<br>20623 | ----  |
|---------------------------------------------------------------|--------------------|------|------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-------|
| Sampling date / time                                          |                    |      |      | 23-Jun-2022 08:27           | 23-Jun-2022 09:21           | 23-Jun-2022 09:37           | 23-Jun-2022 12:41           | ----  |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2207814-001               | EP2207814-002               | EP2207814-003               | EP2207814-004               | ----- |
|                                                               |                    |      |      | Result                      | Result                      | Result                      | Result                      | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                             |                             |                             |                             |       |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05                       | <0.05                       | <0.05                       | <0.05                       | ----  |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                             |                             |                             |                             |       |
| Sum of PFAS                                                   | ----               | 0.01 | µg/L | <0.01                       | <0.01                       | <0.01                       | <0.01                       | ----  |
| Sum of PFHxS and PFOS                                         | 355-46-4/1763-23-1 | 0.01 | µg/L | <0.01                       | <0.01                       | <0.01                       | <0.01                       | ----  |
| Sum of PFAS (WA DER List)                                     | ----               | 0.01 | µg/L | <0.01                       | <0.01                       | <0.01                       | <0.01                       | ----  |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                             |                             |                             |                             |       |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 104                         | 92.8                        | 102                         | 106                         | ----  |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 104                         | 105                         | 102                         | 92.2                        | ----  |



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Work Order : EP2207814  
Client : STANTEC AUSTRALIA PTY LTD  
Project : WA\_0960\_PFASOMP



## Surrogate Control Limits

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

## Inter-Laboratory Testing

Analysis conducted by ALS Sydney, NATA accreditation no. 825, site no. 10911 (Chemistry) 14913 (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              | : EP2207814                                       | Page                    | : 1 of 8                                                 |
| Client                  | : STANTEC AUSTRALIA PTY LTD                       | Laboratory              | : Environmental Division Perth                           |
| Contact                 | : [REDACTED]                                      | Contact                 | : [REDACTED]                                             |
| Address                 | : GROUND FLOOR 226 ADELAIDE TERRACE<br>PERTH 6000 | Address                 | : 26 Rigali Way Wangara Western Australia Australia 6065 |
| Telephone               | : ----                                            | Telephone               | : +6138549 9609                                          |
| Project                 | : WA_0960_PFASOMP                                 | Date Samples Received   | : 27-Jun-2022                                            |
| Order number            | : pfas-omp Learmonth                              | Date Analysis Commenced | : 28-Jun-2022                                            |
| C-O-C number            | : 39283                                           | Issue Date              | : 08-Jul-2022                                            |
| Sampler                 | : [REDACTED]                                      |                         |                                                          |
| Site                    | : Learmonth GW - [REDACTED]                       |                         |                                                          |
| Quote number            | : SY/139/19 B                                     |                         |                                                          |
| No. of samples received | : 4                                               |                         |                                                          |
| No. of samples analysed | : 4                                               |                         |                                                          |



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

This Quality Control Report contains the following information:

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

### Signatories

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

| Signatories | Position                   | Accreditation Category                       |
|-------------|----------------------------|----------------------------------------------|
| [REDACTED]  | Laboratory Manager (Perth) | Perth Inorganics, Wangara, Western Australia |
| [REDACTED]  | LCMS Coordinator           | Sydney Organics, Smithfield, NSW             |



## 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**

| Sub-Matrix: WATER                                                 |                         |                                          |             | Laboratory Duplicate (DUP) Report |      |                 |                  |         |                    |
|-------------------------------------------------------------------|-------------------------|------------------------------------------|-------------|-----------------------------------|------|-----------------|------------------|---------|--------------------|
| Laboratory sample ID                                              | Sample ID               | Method: Compound                         | CAS Number  | LOR                               | Unit | Original Result | Duplicate Result | RPD (%) | Acceptable RPD (%) |
| ED037P: Alkalinity by PC Titrator (QC Lot: 4445365)               |                         |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207732-003                                                     | Anonymous               | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                         | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                         | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 100             | 100              | 0.0     | 0% - 20%           |
|                                                                   |                         | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 100             | 100              | 0.0     | 0% - 20%           |
| EP2207893-004                                                     | Anonymous               | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                         | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                         | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 89              | 78               | 12.2    | 0% - 20%           |
|                                                                   |                         | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 89              | 78               | 12.2    | 0% - 20%           |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4429743) |                         |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207814-001                                                     | 0960_MW178_2-2.5_220623 | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 6010            | 6040             | 0.6     | 0% - 20%           |
| EP2207891-007                                                     | Anonymous               | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 15              | 15               | 0.0     | 0% - 50%           |
| ED045G: Chloride by Discrete Analyser (QC Lot: 4429742)           |                         |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207814-001                                                     | 0960_MW178_2-2.5_220623 | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 41600           | 41500            | 0.2     | 0% - 20%           |
| EP2207891-007                                                     | Anonymous               | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 39              | 40               | 0.0     | 0% - 20%           |
| ED093F: Dissolved Major Cations (QC Lot: 4427082)                 |                         |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207562-001                                                     | Anonymous               | ED093F: Calcium                          | 7440-70-2   | 1                                 | mg/L | 8               | 8                | 0.0     | No Limit           |
|                                                                   |                         | ED093F: Magnesium                        | 7439-95-4   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                   |                         | ED093F: Sodium                           | 7440-23-5   | 1                                 | mg/L | 2               | 2                | 0.0     | No Limit           |
|                                                                   |                         | ED093F: Potassium                        | 7440-09-7   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
| EP2207563-009                                                     | Anonymous               | ED093F: Calcium                          | 7440-70-2   | 1                                 | mg/L | 566             | 546              | 3.5     | 0% - 20%           |
|                                                                   |                         | ED093F: Magnesium                        | 7439-95-4   | 1                                 | mg/L | 1010            | 973              | 4.2     | 0% - 20%           |
|                                                                   |                         | ED093F: Sodium                           | 7440-23-5   | 1                                 | mg/L | 8280            | 7940             | 4.3     | 0% - 20%           |



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 (%) |
| ED093F: Dissolved Major Cations (QC Lot: 4427082) - continued |            |                                                |            |                                       |          |                 |                  |         |                    |
| EP2207563-009                                                 | Anonymous  | ED093F: Potassium                              | 7440-09-7  | 1                                     | mg/L     | 373             | 357              | 4.5     | 0% - 20%           |
| EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4440297)       |            |                                                |            |                                       |          |                 |                  |         |                    |
| EP2207816-008                                                 | 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           |
| ES2222761-002                                                 | Anonymous  | EP231X: Perfluorohexane sulfonic acid (PFHxS)  | 355-46-4   | 0.01                                  | µg/L     | <0.01           | <0.01            | 0.0     | No Limit           |
|                                                               |            | EP231X: Perfluorooctane sulfonic acid (PFOS)   | 1763-23-1  | 0.01                                  | µg/L     | <0.01           | <0.01            | 0.0     | No Limit           |
|                                                               |            | EP231X: Perfluorobutane sulfonic acid (PFBS)   | 375-73-5   | 0.02                                  | µg/L     | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                               |            | EP231X: Perfluoropentane sulfonic acid (PFPeS) | 2706-91-4  | 0.02                                  | µg/L     | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                               |            | EP231X: Perfluoroheptane sulfonic acid (PFHpS) | 375-92-8   | 0.02                                  | µg/L     | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                               |            | EP231X: Perfluorodecane sulfonic acid (PFDS)   | 335-77-3   | 0.02                                  | µg/L     | <0.02           | <0.02            | 0.0     | No Limit           |
| EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4440297)     |            |                                                |            |                                       |          |                 |                  |         |                    |
| EP2207816-008                                                 | Anonymous  | EP231X: Perfluorooctanoic acid (PFOA)          | 335-67-1   | 0.01                                  | µg/L     | <0.01           | <0.01            | 0.0     | No Limit           |
|                                                               |            | EP231X: Perfluoropentanoic acid (PFPeA)        | 2706-90-3  | 0.02                                  | µg/L     | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                               |            | EP231X: Perfluorohexanoic acid (PFHxA)         | 307-24-4   | 0.02                                  | µg/L     | <0.02           | <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           |
|                                                               |            | ES2222761-002                                  | Anonymous  | EP231X: Perfluorooctanoic acid (PFOA) | 335-67-1 | 0.01            | µg/L             | <0.01   | <0.01              |
| 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: 4440297)         |            |                                                |            |                                       |          |                 |                  |         |                    |
| EP2207816-008                                                 | Anonymous  | EP231X: Perfluorooctane sulfonamide (FOSA)     | 754-91-6   | 0.02                                  | µg/L     | <0.02           | <0.02            | 0.0     | 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 (%) |
| EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4440297) - continued |           |                                                                   |             |                                   |      |                 |                  |         |                    |
| EP2207816-008                                                     | 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           |
| ES2222761-002                                                     | Anonymous | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                   |           | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                   |           | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                   |           | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |           | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |           | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |           | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4440297)      |           |                                                                   |             |                                   |      |                 |                  |         |                    |
| EP2207816-008                                                     | Anonymous | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |           | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 27619-97-2  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |           | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | 39108-34-4  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |           | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | 120226-60-0 | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
| ES2222761-002                                                     | Anonymous | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |           | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 27619-97-2  | 0.05                              | µg/L | 0.10            | 0.10             | 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: 4440297) - continued |           |                                                     |             |                                   |      |                 |                  |         |                    |
| ES2222761-002                                                            | Anonymous | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS) | 120226-60-0 | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
| EP231P: PFAS Sums (QC Lot: 4440297)                                      |           |                                                     |             |                                   |      |                 |                  |         |                    |
| EP2207816-008                                                            | Anonymous | EP231X: Sum of PFAS                                 | ----        | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
| ES2222761-002                                                            | Anonymous | EP231X: Sum of PFAS                                 | ----        | 0.01                              | µg/L | 0.10            | 0.10             | 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**

| Sub-Matrix: WATER                                                |             |      |      | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |      |
|------------------------------------------------------------------|-------------|------|------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|------|
|                                                                  |             |      |      |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |      |
| Method: Compound                                                 | CAS Number  | LOR  | Unit | Result                      |                                       |                           |                                   |      |
| ED037P: Alkalinity by PC Titrator (QCLot: 4445365)               |             |      |      |                             |                                       |                           |                                   |      |
| ED037-P: Hydroxide Alkalinity as CaCO3                           | DMO-210-001 | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Carbonate Alkalinity as CaCO3                           | 3812-32-6   | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Bicarbonate Alkalinity as CaCO3                         | 71-52-3     | 1    | mg/L | <1                          | ----                                  | ----                      | ----                              | ---- |
| ED037-P: Total Alkalinity as CaCO3                               | ----        | 1    | mg/L | <1                          | 20 mg/L                               | 102                       | 87.8                              | 118  |
|                                                                  |             |      |      | <1                          | 200 mg/L                              | 96.5                      | 87.8                              | 118  |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4429743) |             |      |      |                             |                                       |                           |                                   |      |
| ED041G: Sulfate as SO4 - Turbidimetric                           | 14808-79-8  | 1    | mg/L | <1                          | 25 mg/L                               | 102                       | 89.9                              | 112  |
|                                                                  |             |      |      | <1                          | 500 mg/L                              | 104                       | 89.9                              | 112  |
| ED045G: Chloride by Discrete Analyser (QCLot: 4429742)           |             |      |      |                             |                                       |                           |                                   |      |
| ED045G: Chloride                                                 | 16887-00-6  | 1    | mg/L | <1                          | 10 mg/L                               | 111                       | 88.6                              | 113  |
|                                                                  |             |      |      | <1                          | 1000 mg/L                             | 101                       | 88.6                              | 113  |
| ED093F: Dissolved Major Cations (QCLot: 4427082)                 |             |      |      |                             |                                       |                           |                                   |      |
| ED093F: Calcium                                                  | 7440-70-2   | 1    | mg/L | <1                          | 50 mg/L                               | 98.8                      | 86.5                              | 117  |
| ED093F: Magnesium                                                | 7439-95-4   | 1    | mg/L | <1                          | 50 mg/L                               | 96.7                      | 88.4                              | 110  |
| ED093F: Sodium                                                   | 7440-23-5   | 1    | mg/L | <1                          | 50 mg/L                               | 108                       | 91.4                              | 113  |
| ED093F: Potassium                                                | 7440-09-7   | 1    | mg/L | <1                          | 50 mg/L                               | 90.2                      | 84.6                              | 108  |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4440297)           |             |      |      |                             |                                       |                           |                                   |      |
| EP231X: Perfluorobutane sulfonic acid (PFBS)                     | 375-73-5    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 110                       | 72.0                              | 130  |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)                   | 2706-91-4   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 110                       | 71.0                              | 127  |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)                    | 355-46-4    | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 101                       | 68.0                              | 131  |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)                   | 375-92-8    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 109                       | 69.0                              | 134  |
| EP231X: Perfluorooctane sulfonic acid (PFOS)                     | 1763-23-1   | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 106                       | 65.0                              | 140  |
| EP231X: Perfluorodecane sulfonic acid (PFDS)                     | 335-77-3    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 103                       | 53.0                              | 142  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4440297)         |             |      |      |                             |                                       |                           |                                   |      |
| 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                             | 111                       | 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                             | 114                       | 72.0                              | 130  |
| EP231X: Perfluorooctanoic acid (PFOA)                            | 335-67-1    | 0.01 | µg/L | <0.01                       | 0.25 µg/L                             | 117                       | 71.0                              | 133  |
| EP231X: Perfluorononanoic acid (PFNA)                            | 375-95-1    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 120                       | 69.0                              | 130  |
| EP231X: Perfluorodecanoic acid (PFDA)                            | 335-76-2    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 114                       | 71.0                              | 129  |
| EP231X: Perfluoroundecanoic acid (PFUnDA)                        | 2058-94-8   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 109                       | 69.0                              | 133  |
| EP231X: Perfluorododecanoic acid (PFDoDA)                        | 307-55-1    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 114                       | 72.0                              | 134  |





Sub-Matrix: **WATER**

| Sub-Matrix: WATER                                                    |             |      |      | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |     |
|----------------------------------------------------------------------|-------------|------|------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|-----|
|                                                                      |             |      |      |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |     |
| Method: Compound                                                     | CAS Number  | LOR  | Unit | Result                      |                                       |                           |                                   |     |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4440297) - continued |             |      |      |                             |                                       |                           |                                   |     |
| 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                            | 105                       | 71.0                              | 132 |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4440297)                 |             |      |      |                             |                                       |                           |                                   |     |
| 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                            | 108                       | 68.0                              | 141 |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)                 | 4151-50-2   | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 110                       | 62.6                              | 147 |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)         | 24448-09-7  | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 103                       | 66.0                              | 145 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)          | 1691-99-2   | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 108                       | 57.6                              | 145 |
| EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)    | 2355-31-9   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 119                       | 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: 4440297)          |             |      |      |                             |                                       |                           |                                   |     |
| EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                    | 757124-72-4 | 0.05 | µg/L | <0.05                       | 0.25 µg/L                             | 114                       | 63.0                              | 143 |
| EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                    | 27619-97-2  | 0.05 | µg/L | <0.05                       | 0.25 µg/L                             | 115                       | 64.0                              | 140 |
| EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                    | 39108-34-4  | 0.05 | µg/L | <0.05                       | 0.25 µg/L                             | 117                       | 67.0                              | 138 |
| EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)                  | 120226-60-0 | 0.05 | µg/L | <0.05                       | 0.25 µg/L                             | 107                       | 71.4                              | 144 |

## Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

|                                                                         |                         |                                                |            | Matrix Spike (MS) Report |                        |                       |      |
|-------------------------------------------------------------------------|-------------------------|------------------------------------------------|------------|--------------------------|------------------------|-----------------------|------|
|                                                                         |                         |                                                |            | Spike<br>Concentration   | SpikeRecovery(%)<br>MS | Acceptable Limits (%) |      |
| Laboratory sample ID                                                    | Sample ID               | Method: Compound                               | CAS Number |                          |                        | Low                   | High |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4429743)</b> |                         |                                                |            |                          |                        |                       |      |
| EP2207814-001                                                           | 0960_MW178_2-2.5_220623 | ED041G: Sulfate as SO4 - Turbidimetric         | 14808-79-8 | 100 mg/L                 | # Not Determined       | 70.4                  | 130  |
| <b>ED045G: Chloride by Discrete Analyser (QCLot: 4429742)</b>           |                         |                                                |            |                          |                        |                       |      |
| EP2207814-001                                                           | 0960_MW178_2-2.5_220623 | ED045G: Chloride                               | 16887-00-6 | 1000 mg/L                | # Not Determined       | 70.0                  | 130  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4440297)</b>           |                         |                                                |            |                          |                        |                       |      |
| ES2222761-001                                                           | Anonymous               | EP231X: Perfluorobutane sulfonic acid (PFBS)   | 375-73-5   | 0.25 µg/L                | 113                    | 72.0                  | 130  |
|                                                                         |                         | EP231X: Perfluoropentane sulfonic acid (PFPeS) | 2706-91-4  | 0.25 µg/L                | 108                    | 71.0                  | 127  |
|                                                                         |                         | EP231X: Perfluorohexane sulfonic acid (PFHxS)  | 355-46-4   | 0.25 µg/L                | 102                    | 68.0                  | 131  |
|                                                                         |                         | EP231X: Perfluoroheptane sulfonic acid (PFHpS) | 375-92-8   | 0.25 µg/L                | 106                    | 69.0                  | 134  |



Sub-Matrix: **WATER**

| 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: 4440297) - continued |           |                                                                   |             |                          |                  |                       |      |
| ES2222761-001                                                      | Anonymous | EP231X: Perfluorooctane sulfonic acid (PFOS)                      | 1763-23-1   | 0.25 µg/L                | 104              | 65.0                  | 140  |
|                                                                    |           | EP231X: Perfluorodecane sulfonic acid (PFDS)                      | 335-77-3    | 0.25 µg/L                | 105              | 53.0                  | 142  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4440297)           |           |                                                                   |             |                          |                  |                       |      |
| ES2222761-001                                                      | Anonymous | EP231X: Perfluorobutanoic acid (PFBA)                             | 375-22-4    | 1.25 µg/L                | 97.7             | 73.0                  | 129  |
|                                                                    |           | EP231X: Perfluoropentanoic acid (PFPeA)                           | 2706-90-3   | 0.25 µg/L                | 112              | 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                | 111              | 72.0                  | 130  |
|                                                                    |           | EP231X: Perfluorooctanoic acid (PFOA)                             | 335-67-1    | 0.25 µg/L                | 111              | 71.0                  | 133  |
|                                                                    |           | EP231X: Perfluorononanoic acid (PFNA)                             | 375-95-1    | 0.25 µg/L                | 121              | 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                | 115              | 72.0                  | 134  |
|                                                                    |           | EP231X: Perfluorotridecanoic acid (PFTrDA)                        | 72629-94-8  | 0.25 µg/L                | 109              | 65.0                  | 144  |
|                                                                    |           | EP231X: Perfluorotetradecanoic acid (PFTeDA)                      | 376-06-7    | 0.625 µg/L               | 95.0             | 71.0                  | 132  |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4440297)               |           |                                                                   |             |                          |                  |                       |      |
| ES2222761-001                                                      | Anonymous | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.25 µg/L                | 109              | 67.0                  | 137  |
|                                                                    |           | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.625 µg/L               | 101              | 68.0                  | 141  |
|                                                                    |           | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.625 µg/L               | 102              | 62.6                  | 147  |
|                                                                    |           | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.625 µg/L               | 93.0             | 66.0                  | 145  |
|                                                                    |           | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.625 µg/L               | 110              | 57.6                  | 145  |
|                                                                    |           | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9   | 0.25 µg/L                | 109              | 65.0                  | 136  |
|                                                                    |           | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.25 µg/L                | 110              | 61.0                  | 135  |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4440297)        |           |                                                                   |             |                          |                  |                       |      |
| ES2222761-001                                                      | Anonymous | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.25 µg/L                | 109              | 63.0                  | 143  |
|                                                                    |           | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 27619-97-2  | 0.25 µg/L                | 118              | 64.0                  | 140  |
|                                                                    |           | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | 39108-34-4  | 0.25 µg/L                | 119              | 67.0                  | 138  |
|                                                                    |           | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | 120226-60-0 | 0.25 µg/L                | 109              | 71.4                  | 144  |

## QA/QC Compliance Assessment to assist with Quality Review

|              |                             |                         |                                |
|--------------|-----------------------------|-------------------------|--------------------------------|
| Work Order   | : EP2207814                 | Page                    | : 1 of 5                       |
| Client       | : STANTEC AUSTRALIA PTY LTD | Laboratory              | : Environmental Division Perth |
| Contact      | : [REDACTED]                | Telephone               | : +6138549 9609                |
| Project      | : WA_0960_PFASOMP           | Date Samples Received   | : 27-Jun-2022                  |
| Site         | : Learmonth GW - [REDACTED] | Issue Date              | : 08-Jul-2022                  |
| Sampler      | : [REDACTED]                | No. of samples received | : 4                            |
| Order number | : pfas-omp Learmonth        | 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                                                                               |
|-------------------------------------------------------------|----------------------|-------------------------|--------------------------------------------|------------|----------------|--------|---------------------------------------------------------------------------------------|
| <b>Matrix Spike (MS) Recoveries</b>                         |                      |                         |                                            |            |                |        |                                                                                       |
| ED041G: Sulfate (Turbidimetric) as SO <sub>4</sub> 2- by DA | EP2207814--001       | 0960_MW178_2-2.5_220623 | Sulfate as SO <sub>4</sub> - Turbidimetric | 14808-79-8 | Not Determined | ----   | MS recovery not determined, background level greater than or equal to 4x spike level. |
| ED045G: Chloride by Discrete Analyser                       | EP2207814--001       | 0960_MW178_2-2.5_220623 | Chloride                                   | 16887-00-6 | Not Determined | ----   | MS recovery not determined, background level greater than or equal to 4x spike level. |

## Analysis Holding Time Compliance

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

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

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

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

Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                                                                           | Sample Date                                         | Extraction / Preparation |                    |             | Analysis      |                  |             |   |
|--------------------------------------------------------------------------------------------------|-----------------------------------------------------|--------------------------|--------------------|-------------|---------------|------------------|-------------|---|
| Container / Client Sample ID(s)                                                                  |                                                     | Date extracted           | Due for extraction | Evaluation  | Date analysed | Due for analysis | Evaluation  |   |
| ED037P: Alkalinity by PC Titrator                                                                |                                                     |                          |                    |             |               |                  |             |   |
| Clear Plastic Bottle - Natural (ED037-P)<br>0960_MW178_2-2.5_220623,<br>0960_MW177_1.5-2_220623, | 0960_MW176_1.5-2_220623,<br>0960_MW175_4-4.5_220623 | 23-Jun-2022              | ----               | ----        | ----          | 07-Jul-2022      | 07-Jul-2022 | ✓ |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA                                                  |                                                     |                          |                    |             |               |                  |             |   |
| Clear Plastic Bottle - Natural (ED041G)<br>0960_MW178_2-2.5_220623,<br>0960_MW177_1.5-2_220623,  | 0960_MW176_1.5-2_220623,<br>0960_MW175_4-4.5_220623 | 23-Jun-2022              | ----               | ----        | ----          | 08-Jul-2022      | 21-Jul-2022 | ✓ |
| ED045G: Chloride by Discrete Analyser                                                            |                                                     |                          |                    |             |               |                  |             |   |
| Clear Plastic Bottle - Natural (ED045G)<br>0960_MW178_2-2.5_220623,<br>0960_MW177_1.5-2_220623,  | 0960_MW176_1.5-2_220623,<br>0960_MW175_4-4.5_220623 | 23-Jun-2022              | ----               | ----        | ----          | 08-Jul-2022      | 21-Jul-2022 | ✓ |
| ED093F: Dissolved Major Cations                                                                  |                                                     |                          |                    |             |               |                  |             |   |
| Clear Plastic Bottle - Natural (ED093F)<br>0960_MW178_2-2.5_220623,<br>0960_MW177_1.5-2_220623,  | 0960_MW176_1.5-2_220623,<br>0960_MW175_4-4.5_220623 | 23-Jun-2022              | ----               | ----        | ----          | 28-Jun-2022      | 30-Jun-2022 | ✓ |
| EP231A: Perfluoroalkyl Sulfonic Acids                                                            |                                                     |                          |                    |             |               |                  |             |   |
| HDPE (no PTFE) (EP231X)<br>0960_MW178_2-2.5_220623,<br>0960_MW177_1.5-2_220623,                  | 0960_MW176_1.5-2_220623,<br>0960_MW175_4-4.5_220623 | 23-Jun-2022              | 06-Jul-2022        | 20-Dec-2022 | ✓             | 07-Jul-2022      | 20-Dec-2022 | ✓ |

Page : 3 of 5  
 Work Order : EP2207814  
 Client : STANTEC AUSTRALIA PTY LTD  
 Project : WA\_0960\_PFASOMP



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                                                          | Sample Date                                         | Extraction / Preparation |                    |             | Analysis      |                  |             |   |
|---------------------------------------------------------------------------------|-----------------------------------------------------|--------------------------|--------------------|-------------|---------------|------------------|-------------|---|
| Container / Client Sample ID(s)                                                 |                                                     | Date extracted           | Due for extraction | Evaluation  | Date analysed | Due for analysis | Evaluation  |   |
| EP231B: Perfluoroalkyl Carboxylic Acids                                         |                                                     |                          |                    |             |               |                  |             |   |
| HDPE (no PTFE) (EP231X)<br>0960_MW178_2-2.5_220623,<br>0960_MW177_1.5-2_220623, | 0960_MW176_1.5-2_220623,<br>0960_MW175_4-4.5_220623 | 23-Jun-2022              | 06-Jul-2022        | 20-Dec-2022 | ✓             | 07-Jul-2022      | 20-Dec-2022 | ✓ |
| EP231C: Perfluoroalkyl Sulfonamides                                             |                                                     |                          |                    |             |               |                  |             |   |
| HDPE (no PTFE) (EP231X)<br>0960_MW178_2-2.5_220623,<br>0960_MW177_1.5-2_220623, | 0960_MW176_1.5-2_220623,<br>0960_MW175_4-4.5_220623 | 23-Jun-2022              | 06-Jul-2022        | 20-Dec-2022 | ✓             | 07-Jul-2022      | 20-Dec-2022 | ✓ |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids                                      |                                                     |                          |                    |             |               |                  |             |   |
| HDPE (no PTFE) (EP231X)<br>0960_MW178_2-2.5_220623,<br>0960_MW177_1.5-2_220623, | 0960_MW176_1.5-2_220623,<br>0960_MW175_4-4.5_220623 | 23-Jun-2022              | 06-Jul-2022        | 20-Dec-2022 | ✓             | 07-Jul-2022      | 20-Dec-2022 | ✓ |
| EP231P: PFAS Sums                                                               |                                                     |                          |                    |             |               |                  |             |   |
| HDPE (no PTFE) (EP231X)<br>0960_MW178_2-2.5_220623,<br>0960_MW177_1.5-2_220623, | 0960_MW176_1.5-2_220623,<br>0960_MW175_4-4.5_220623 | 23-Jun-2022              | 06-Jul-2022        | 20-Dec-2022 | ✓             | 07-Jul-2022      | 20-Dec-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                            |         | Count |         | Rate (%) |          |            | Quality Control Specification  |
|--------------------------------------------------------|---------|-------|---------|----------|----------|------------|--------------------------------|
| Analytical Methods                                     | Method  | QC    | Regular | Actual   | Expected | Evaluation |                                |
|                                                        |         |       |         |          |          |            |                                |
| Laboratory Duplicates (DUP)                            |         |       |         |          |          |            |                                |
| Alkalinity by Auto Titrator                            | ED037-P | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 2     | 19      | 10.53    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Laboratory Control Samples (LCS)                       |         |       |         |          |          |            |                                |
| Alkalinity by Auto Titrator                            | ED037-P | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 19      | 5.26     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Method Blanks (MB)                                     |         |       |         |          |          |            |                                |
| Alkalinity by Auto Titrator                            | ED037-P | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 19      | 5.26     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Matrix Spikes (MS)                                     |         |       |         |          |          |            |                                |
| Chloride by Discrete Analyser                          | ED045G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 1     | 19      | 5.26     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 1     | 20      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |



## Brief Method Summaries

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

| Analytical Methods                                                 | Method       | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------------------|--------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alkalinity by Auto Titrator                                        | ED037-P      | WATER  | In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                                                                                                                                                                                                                |
| Sulfate (Turbidimetric) as SO <sub>4</sub> 2- by Discrete Analyser | ED041G       | WATER  | In house: Referenced to APHA 4500-SO <sub>4</sub> . Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO <sub>4</sub> suspension is measured by a photometer and the SO <sub>4</sub> -2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                         |
| Chloride by Discrete Analyser                                      | ED045G       | WATER  | In house: Referenced to APHA 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm.                                                                                                                                                                                                                                                                                                                                                                |
| Major Cations - Dissolved                                          | ED093F       | WATER  | In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                           |
| Ionic Balance by PCT DA and Turbi SO <sub>4</sub> DA               | * EN055 - PG | WATER  | In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS               | EP231X       | WATER  | In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements. |
| Preparation Methods                                                | Method       | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Solid Phase Extraction (SPE) for PFAS in water                     | ORG72        | WATER  | In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.                                                                                                                                                                                                |



## SAMPLE RECEIPT NOTIFICATION (SRN)

**Work Order : EP2207815**

|                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Client : <b>STANTEC AUSTRALIA PTY LTD</b></p> <p>Contact : [REDACTED]</p> <p>Address : GROUND FLOOR 226 ADELAIDE TERRACE<br/>PERTH 6000</p> <p>E-mail : [REDACTED]@stantec.com</p> <p>Telephone : ----</p> <p>Facsimile : ----</p> <p>Project : WA_0960_PFASOMP</p> <p>Order number : pfas-omp Learmonth</p> <p>C-O-C number : 39284</p> <p>Site : Learmonth SD - [REDACTED]</p> <p>Sampler : [REDACTED]</p> | <p>Laboratory : Environmental Division Perth</p> <p>Contact : [REDACTED]</p> <p>Address : 26 Rigali Way Wangara Western<br/>Australia Australia 6065</p> <p>E-mail : [REDACTED]@alsglobal.com</p> <p>Telephone : +6138549 9609</p> <p>Facsimile : +61-8-9406 1399</p> <p>Page : 1 of 2</p> <p>Quote number : ES2022MWHAUS0002 (SY/139/19 B)</p> <p>QC Level : NEPM 2013 B3 &amp; ALS QC Standard</p> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Dates

|                                           |                                               |
|-------------------------------------------|-----------------------------------------------|
| Date Samples Received : 27-Jun-2022 11:40 | Issue Date : 30-Jun-2022                      |
| Client Requested Due : 08-Jul-2022        | Scheduled Reporting Date : <b>08-Jul-2022</b> |
| Date                                      |                                               |

### Delivery Details

|                            |                                            |
|----------------------------|--------------------------------------------|
| Mode of Delivery : Carrier | Security Seal : Not Available              |
| No. of coolers/boxes : 5   | Temperature : 13.4 - Ice present           |
| Receipt Detail :           | No. of samples received / analysed : 9 / 9 |

### General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- EP231X conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- Please see scanned COC for sample discrepancies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.



## Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exists.

## Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: SOIL

| Laboratory sample ID | Sampling date / time | Sample ID          | SOIL - EA055-103 Moisture Content | SOIL - EP231X (solids) PFAS - Full Suite (28 analytes) |
|----------------------|----------------------|--------------------|-----------------------------------|--------------------------------------------------------|
| EP2207815-001        | 23-Jun-2022 08:37    | 0960_SD211_220623  | ✓                                 | ✓                                                      |
| EP2207815-002        | 23-Jun-2022 08:52    | 0960_SD300_220623  | ✓                                 | ✓                                                      |
| EP2207815-003        | 23-Jun-2022 09:50    | 0960_SD301_220623  | ✓                                 | ✓                                                      |
| EP2207815-004        | 23-Jun-2022 10:06    | 0960_SD303_220623  | ✓                                 | ✓                                                      |
| EP2207815-005        | 23-Jun-2022 00:00    | 0960_SS190_220623  | ✓                                 | ✓                                                      |
| EP2207815-006        | 23-Jun-2022 00:00    | 0960_SS192_220623  | ✓                                 | ✓                                                      |
| EP2207815-007        | 23-Jun-2022 00:00    | 0960_SS193_220623  | ✓                                 | ✓                                                      |
| EP2207815-008        | 23-Jun-2022 00:00    | 0960_SD304A_220623 | ✓                                 | ✓                                                      |
| EP2207815-009        | 23-Jun-2022 00:00    | 0960_SD304B_220623 | ✓                                 | ✓                                                      |

## Proactive Holding Time Report

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

## Requested Deliverables

|                                                                                                                  |       |                              |
|------------------------------------------------------------------------------------------------------------------|-------|------------------------------|
| <ul style="list-style-type: none"> <li>- A4 - AU Tax Invoice (INV)</li> </ul>                                    | Email | cardno.com.au                |
| <b>DERP LAB REPORTS</b>                                                                                          |       |                              |
| <ul style="list-style-type: none"> <li>- EDI Format - ESDAT (ESDAT)</li> </ul>                                   | Email | derp.labreports@esdat.com.au |
| <ul style="list-style-type: none"> <li>- *AU Certificate of Analysis - NATA (COA)</li> </ul>                     | Email | stantec.com                  |
| <ul style="list-style-type: none"> <li>- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)</li> </ul>    | Email | stantec.com                  |
| <ul style="list-style-type: none"> <li>- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)</li> </ul>            | Email | stantec.com                  |
| <ul style="list-style-type: none"> <li>- A4 - AU Sample Receipt Notification - Environmental HT (SRN)</li> </ul> | Email | stantec.com                  |
| <ul style="list-style-type: none"> <li>- Chain of Custody (CoC) (COC)</li> </ul>                                 | Email | stantec.com                  |
| <ul style="list-style-type: none"> <li>- EDI Format - ESDAT (ESDAT)</li> </ul>                                   | Email | stantec.com                  |
| <ul style="list-style-type: none"> <li>- EDI Format - XTab (XTAB)</li> </ul>                                     | Email | stantec.com                  |

## CERTIFICATE OF ANALYSIS

**Work Order** : **EP2207815**  
**Client** : **STANTEC AUSTRALIA PTY LTD**  
**Contact** : [REDACTED]  
**Address** : **GROUND FLOOR 226 ADELAIDE TERRACE**  
**PERTH 6000**  
**Telephone** : **----**  
**Project** : **WA\_0960\_PFASOMP**  
**Order number** : **pfas-omp Learmonth**  
**C-O-C number** : **39284**  
**Sampler** : [REDACTED]  
**Site** : **Learmonth SD - SC**  
**Quote number** : **SY/139/19 B**  
**No. of samples received** : **9**  
**No. of samples analysed** : **9**

**Page** : 1 of 7  
**Laboratory** : Environmental Division Perth  
**Contact** : [REDACTED]  
**Address** : **26 Rigali Way Wangara Western Australia Australia 6065**  
**Telephone** : **+6138549 9609**  
**Date Samples Received** : **27-Jun-2022 11:40**  
**Date Analysis Commenced** : **04-Jul-2022**  
**Issue Date** : **08-Jul-2022 11:15**



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             |
|------------------------------------------------------------------------|------------------|------------------------------------|
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator | Sydney Inorganics, Smithfield, NSW |
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator | Sydney Organics, Smithfield, NSW   |



## 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 conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- 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

|                                                    |            |        |       | 0960_SD211_220623 | 0960_SD300_220623 | 0960_SD301_220623 | 0960_SD303_220623 | 0960_SS190_220623 |
|----------------------------------------------------|------------|--------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                               |            |        |       | 23-Jun-2022 08:37 | 23-Jun-2022 08:52 | 23-Jun-2022 09:50 | 23-Jun-2022 10:06 | 23-Jun-2022 00:00 |
| Compound                                           | CAS Number | LOR    | Unit  | EP2207815-001     | EP2207815-002     | EP2207815-003     | EP2207815-004     | EP2207815-005     |
|                                                    |            |        |       | Result            | Result            | Result            | Result            | Result            |
| <b>EA055: Moisture Content (Dried @ 105-110°C)</b> |            |        |       |                   |                   |                   |                   |                   |
| Moisture Content                                   | ----       | 0.1    | %     | 36.0              | 31.5              | 36.3              | 31.2              | 34.3              |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>       |            |        |       |                   |                   |                   |                   |                   |
| 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           | 0.0004            | <0.0002           | <0.0002           | <0.0002           |
| Perfluorohexane sulfonic acid (PFHxS)              | 355-46-4   | 0.0002 | mg/kg | <0.0002           | 0.0022            | <0.0002           | <0.0002           | <0.0002           |
| Perfluoroheptane sulfonic acid (PFHpS)             | 375-92-8   | 0.0002 | mg/kg | <0.0002           | <0.0002           | 0.0003            | <0.0002           | <0.0002           |
| Perfluorooctane sulfonic acid (PFOS)               | 1763-23-1  | 0.0002 | mg/kg | 0.0010            | 0.0012            | <0.0002           | <0.0002           | 0.0027            |
| Perfluorodecane sulfonic acid (PFDS)               | 335-77-3   | 0.0002 | mg/kg | <0.0002           | <0.0002           | <0.0002           | <0.0002           | 0.0015            |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>     |            |        |       |                   |                   |                   |                   |                   |
| 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           | 0.0008            | <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 (PFTTrDA)                | 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           |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>         |            |        |       |                   |                   |                   |                   |                   |
| 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<br>(Matrix: SOIL)                    |                    |        |       | Sample ID | 0960_SD211_220623 | 0960_SD300_220623 | 0960_SD301_220623 | 0960_SD303_220623 | 0960_SS190_220623 |
|-----------------------------------------------------------|--------------------|--------|-------|-----------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                      |                    |        |       |           | 23-Jun-2022 08:37 | 23-Jun-2022 08:52 | 23-Jun-2022 09:50 | 23-Jun-2022 10:06 | 23-Jun-2022 00:00 |
| Compound                                                  | CAS Number         | LOR    | Unit  |           | EP2207815-001     | EP2207815-002     | EP2207815-003     | EP2207815-004     | EP2207815-005     |
|                                                           |                    |        |       | Result    | Result            | Result            | Result            | Result            | Result            |
| <b>EP231C: Perfluoroalkyl Sulfonamides - Continued</b>    |                    |        |       |           |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>         |                    |        |       |           |                   |                   |                   |                   |                   |
| 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           |
| <b>EP231P: PFAS Sums</b>                                  |                    |        |       |           |                   |                   |                   |                   |                   |
| Sum of PFAS                                               | ----               | 0.0002 | mg/kg | 0.0010    | 0.0053            | 0.0003            | <0.0002           | 0.0042            |                   |
| Sum of PFHxS and PFOS                                     | 355-46-4/1763-23-1 | 0.0002 | mg/kg | 0.0010    | 0.0034            | <0.0002           | <0.0002           | 0.0027            |                   |
| Sum of PFAS (WA DER List)                                 | ----               | 0.0002 | mg/kg | 0.0010    | 0.0049            | <0.0002           | <0.0002           | 0.0027            |                   |
| <b>EP231S: PFAS Surrogate</b>                             |                    |        |       |           |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                 | ----               | 0.0002 | %     | 99.0      | 90.0              | 95.5              | 90.0              | 92.0              |                   |
| 13C8-PFOA                                                 | ----               | 0.0002 | %     | 98.5      | 95.5              | 98.0              | 90.5              | 94.5              |                   |



## Analytical Results

Sub-Matrix: SEDIMENT  
 (Matrix: SOIL)

Sample ID

|                                                    |            |        |       | 0960_SS192_220623 | 0960_SS193_220623 | 0960_SD304A_220623 | 0960_SD304B_220623 | ----  |
|----------------------------------------------------|------------|--------|-------|-------------------|-------------------|--------------------|--------------------|-------|
| Sampling date / time                               |            |        |       | 23-Jun-2022 00:00 | 23-Jun-2022 00:00 | 23-Jun-2022 00:00  | 23-Jun-2022 00:00  | ----  |
| Compound                                           | CAS Number | LOR    | Unit  | EP2207815-006     | EP2207815-007     | EP2207815-008      | EP2207815-009      | ----- |
|                                                    |            |        |       | Result            | Result            | Result             | Result             | ----  |
| <b>EA055: Moisture Content (Dried @ 105-110°C)</b> |            |        |       |                   |                   |                    |                    |       |
| Moisture Content                                   | ----       | 0.1    | %     | 28.0              | 24.0              | 25.7               | 27.3               | ----  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>       |            |        |       |                   |                   |                    |                    |       |
| Perfluorobutane sulfonic acid (PFBS)               | 375-73-5   | 0.0002 | mg/kg | <0.0002           | <0.0002           | <0.0002            | <0.0002            | ----  |
| Perfluoropentane sulfonic acid (PFPeS)             | 2706-91-4  | 0.0002 | mg/kg | <0.0002           | <0.0002           | <0.0002            | <0.0002            | ----  |
| Perfluorohexane sulfonic acid (PFHxS)              | 355-46-4   | 0.0002 | mg/kg | <0.0002           | <0.0002           | <0.0002            | <0.0002            | ----  |
| Perfluoroheptane sulfonic acid (PFHpS)             | 375-92-8   | 0.0002 | mg/kg | <0.0002           | <0.0002           | <0.0002            | <0.0002            | ----  |
| Perfluorooctane sulfonic acid (PFOS)               | 1763-23-1  | 0.0002 | mg/kg | 0.0046            | 0.0026            | <0.0002            | <0.0002            | ----  |
| Perfluorodecane sulfonic acid (PFDS)               | 335-77-3   | 0.0002 | mg/kg | <0.0002           | <0.0002           | <0.0002            | <0.0002            | ----  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>     |            |        |       |                   |                   |                    |                    |       |
| 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 (PFTTrDA)                | 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            | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>         |            |        |       |                   |                   |                    |                    |       |
| 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

|                                                           |                    |        |       | 0960_SS192_220623 | 0960_SS193_220623 | 0960_SD304A_22062<br>3 | 0960_SD304B_22062<br>3 | ----  |
|-----------------------------------------------------------|--------------------|--------|-------|-------------------|-------------------|------------------------|------------------------|-------|
| Sampling date / time                                      |                    |        |       | 23-Jun-2022 00:00 | 23-Jun-2022 00:00 | 23-Jun-2022 00:00      | 23-Jun-2022 00:00      | ----  |
| Compound                                                  | CAS Number         | LOR    | Unit  | EP2207815-006     | EP2207815-007     | EP2207815-008          | EP2207815-009          | ----- |
|                                                           |                    |        |       | Result            | Result            | Result                 | Result                 | ----  |
| <b>EP231C: Perfluoroalkyl Sulfonamides - Continued</b>    |                    |        |       |                   |                   |                        |                        |       |
| 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                | ----  |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>         |                    |        |       |                   |                   |                        |                        |       |
| 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                | ----  |
| <b>EP231P: PFAS Sums</b>                                  |                    |        |       |                   |                   |                        |                        |       |
| Sum of PFAS                                               | ----               | 0.0002 | mg/kg | <b>0.0046</b>     | <b>0.0026</b>     | <0.0002                | <0.0002                | ----  |
| Sum of PFHxS and PFOS                                     | 355-46-4/1763-23-1 | 0.0002 | mg/kg | <b>0.0046</b>     | <b>0.0026</b>     | <0.0002                | <0.0002                | ----  |
| Sum of PFAS (WA DER List)                                 | ----               | 0.0002 | mg/kg | <b>0.0046</b>     | <b>0.0026</b>     | <0.0002                | <0.0002                | ----  |
| <b>EP231S: PFAS Surrogate</b>                             |                    |        |       |                   |                   |                        |                        |       |
| 13C4-PFOS                                                 | ----               | 0.0002 | %     | <b>108</b>        | <b>95.0</b>       | <b>90.0</b>            | <b>79.5</b>            | ----  |
| 13C8-PFOA                                                 | ----               | 0.0002 | %     | <b>91.0</b>       | <b>108</b>        | <b>107</b>             | <b>108</b>             | ----  |



### Surrogate Control Limits

| Sub-Matrix: <b>SEDIMENT</b>   |            | Recovery Limits (%) |      |
|-------------------------------|------------|---------------------|------|
| Compound                      | CAS Number | Low                 | High |
| <b>EP231S: PFAS Surrogate</b> |            |                     |      |
| <b>13C4-PFOS</b>              | ----       | 60                  | 120  |
| <b>13C8-PFOA</b>              | ----       | 60                  | 120  |

### Inter-Laboratory Testing

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

## QUALITY CONTROL REPORT

|                         |                                                   |                         |                                                          |
|-------------------------|---------------------------------------------------|-------------------------|----------------------------------------------------------|
| Work Order              | : EP2207815                                       | Page                    | : 1 of 11                                                |
| Client                  | : STANTEC AUSTRALIA PTY LTD                       | Laboratory              | : Environmental Division Perth                           |
| Contact                 | : [REDACTED]                                      | Contact                 | : [REDACTED]                                             |
| Address                 | : GROUND FLOOR 226 ADELAIDE TERRACE<br>PERTH 6000 | Address                 | : 26 Rigali Way Wangara Western Australia Australia 6065 |
| Telephone               | : ----                                            | Telephone               | : +6138549 9609                                          |
| Project                 | : WA_0960_PFASOMP                                 | Date Samples Received   | : 27-Jun-2022                                            |
| Order number            | : pfas-omp Learmonth                              | Date Analysis Commenced | : 04-Jul-2022                                            |
| C-O-C number            | : 39284                                           | Issue Date              | : 08-Jul-2022                                            |
| Sampler                 | : [REDACTED]                                      |                         |                                                          |
| Site                    | : Learmonth SD - [REDACTED]                       |                         |                                                          |
| Quote number            | : SY/139/19 B                                     |                         |                                                          |
| No. of samples received | : 9                                               |                         |                                                          |
| No. of samples analysed | : 9                                               |                         |                                                          |



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]  | LCMS Coordinator | Sydney Inorganics, Smithfield, NSW |
| [REDACTED]  | LCMS Coordinator | Sydney Organics, Smithfield, NSW   |



## 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: <b>SOIL</b>                                       |                    |                                                |            | 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: 4437286) |                    |                                                |            |                                   |       |                 |                  |         |                    |
| EP2207813-006                                                 | Anonymous          | EA055: Moisture Content                        | ----       | 0.1                               | %     | 29.0            | 32.7             | 12.0    | 0% - 20%           |
| EP2207815-009                                                 | 0960_SD304B_220623 | EA055: Moisture Content                        | ----       | 0.1                               | %     | 27.3            | 31.2             | 13.6    | 0% - 20%           |
| EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4443051)       |                    |                                                |            |                                   |       |                 |                  |         |                    |
| EP2207738-001                                                 | Anonymous          | EP231X: Perfluorobutane sulfonic acid (PFBS)   | 375-73-5   | 0.0002                            | mg/kg | 0.0003          | 0.0003           | 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           | 0.0     | 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 | ----            | 0.0020           | 24.2    | No Limit           |
|                                                               |                    | EP231X: Perfluorodecane sulfonic acid (PFDS)   | 335-77-3   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
| EP2207813-006                                                 | Anonymous          | EP231X: Perfluorobutane sulfonic acid (PFBS)   | 375-73-5   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                               |                    | EP231X: Perfluoropentane sulfonic acid (PFPeS) | 2706-91-4  | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                               |                    | EP231X: Perfluorohexane sulfonic acid (PFHxS)  | 355-46-4   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                               |                    | EP231X: Perfluoroheptane sulfonic acid (PFHpS) | 375-92-8   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                               |                    | EP231X: Perfluorooctane sulfonic acid (PFOS)   | 1763-23-1  | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                               |                    | EP231X: Perfluorodecane sulfonic acid (PFDS)   | 335-77-3   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
| EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4443056)       |                    |                                                |            |                                   |       |                 |                  |         |                    |
| EP2207815-008                                                 | 0960_SD304A_220623 | 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           |
| EP2207910-009                                                 | Anonymous          | EP231X: Perfluorobutane sulfonic acid (PFBS)   | 375-73-5   | 0.0002                            | mg/kg | 0.0005          | 0.0006           | 0.0     | No Limit           |
|                                                               |                    | EP231X: Perfluoropentane sulfonic acid (PFPeS) | 2706-91-4  | 0.0002                            | mg/kg | 0.0010          | 0.0012           | 17.1    | 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: 4443056) - continued |                    |                                                |            |                                         |           |                 |                  |         |                    |
| EP2207910-009                                                       | Anonymous          | EP231X: Perfluorohexane sulfonic acid (PFHxS)  | 355-46-4   | 0.0002                                  | mg/kg     | 0.0088          | 0.0107           | 19.4    | 0% - 20%           |
|                                                                     |                    | EP231X: Perfluoroheptane sulfonic acid (PFHpS) | 375-92-8   | 0.0002                                  | mg/kg     | 0.0003          | 0.0004           | 0.0     | No Limit           |
|                                                                     |                    | EP231X: Perfluorooctane sulfonic acid (PFOS)   | 1763-23-1  | 0.0002                                  | mg/kg     | 0.0157          | 0.0177           | 11.6    | 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: 4443051)           |                    |                                                |            |                                         |           |                 |                  |         |                    |
| EP2207738-001                                                       | 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     | 0.0021          | 0.0024           | 10.9    | 0% - 50%           |
|                                                                     |                    | 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           |
| EP2207813-006                                                       | Anonymous          | EP231X: Perfluoropentanoic acid (PFPeA)        | 2706-90-3  | 0.0002                                  | mg/kg     | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                     |                    | EP231X: Perfluorohexanoic acid (PFHxA)         | 307-24-4   | 0.0002                                  | mg/kg     | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                     |                    | EP231X: Perfluoroheptanoic acid (PFHpA)        | 375-85-9   | 0.0002                                  | mg/kg     | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                     |                    | EP231X: Perfluorooctanoic acid (PFOA)          | 335-67-1   | 0.0002                                  | mg/kg     | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                     |                    | EP231X: Perfluorononanoic acid (PFNA)          | 375-95-1   | 0.0002                                  | mg/kg     | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                     |                    | EP231X: Perfluorodecanoic acid (PFDA)          | 335-76-2   | 0.0002                                  | mg/kg     | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                     |                    | EP231X: Perfluoroundecanoic acid (PFUnDA)      | 2058-94-8  | 0.0002                                  | mg/kg     | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                     |                    | EP231X: Perfluorododecanoic acid (PFDoDA)      | 307-55-1   | 0.0002                                  | mg/kg     | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                     |                    | EP231X: Perfluorotridecanoic acid (PFTrDA)     | 72629-94-8 | 0.0002                                  | mg/kg     | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                     |                    | EP231X: Perfluorotetradecanoic acid (PFTeDA)   | 376-06-7   | 0.0005                                  | mg/kg     | <0.0005         | <0.0005          | 0.0     | No Limit           |
|                                                                     |                    | EP231X: Perfluorobutanoic acid (PFBA)          | 375-22-4   | 0.001                                   | mg/kg     | <0.001          | <0.001           | 0.0     | No Limit           |
| EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4443056)           |                    |                                                |            |                                         |           |                 |                  |         |                    |
| EP2207815-008                                                       | 0960_SD304A_220623 | 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           |
|                                                                     |                    | EP2207910-009                                  | Anonymous  | EP231X: Perfluoropentanoic acid (PFPeA) | 2706-90-3 | 0.0002          | mg/kg            | 0.0008  | 0.0009             |



| 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: 4443056) - continued |                    |                                                                   |            |                                   |        |                 |                  |         |                    |
| EP2207910-009                                                         | Anonymous          | EP231X: Perfluorohexanoic acid (PFHxA)                            | 307-24-4   | 0.0002                            | mg/kg  | 0.0010          | 0.0011           | 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  | 0.0008          | 0.0009           | 12.3    | No Limit           |
|                                                                       |                    | EP231X: Perfluorononanoic acid (PFNA)                             | 375-95-1   | 0.0002                            | mg/kg  | 0.0003          | 0.0003           | 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: 4443051)                 |                    |                                                                   |            |                                   |        |                 |                  |         |                    |
| EP2207738-001                                                         | 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           |
|                                                                       |                    | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       |            |                                   |        |                 |                  |         |                    |
| EP2207813-006                                                         | 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           |
|                                                                       |                    | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       |            |                                   |        |                 |                  |         |                    |
| EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4443056)                 |                    |                                                                   |            |                                   |        |                 |                  |         |                    |
| EP2207815-008                                                         | 0960_SD304A_220623 | 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: 4443056) - continued |                    |                                                                   |             |                                   |       |                 |                  |         |                    |
| EP2207815-008                                                     | 0960_SD304A_220623 | 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           |
| EP2207910-009                                                     | Anonymous          | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                   |                    | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                   |                    | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.0002                            | mg/kg | <0.0002         | <0.0002          | 0.0     | No Limit           |
|                                                                   |                    | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.0005                            | mg/kg | <0.0005         | <0.0005          | 0.0     | No Limit           |
|                                                                   |                    | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.0005                            | mg/kg | <0.0005         | <0.0005          | 0.0     | No Limit           |
|                                                                   |                    | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.0005                            | mg/kg | <0.0005         | <0.0005          | 0.0     | No Limit           |
|                                                                   |                    | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.0005                            | mg/kg | <0.0005         | <0.0005          | 0.0     | No Limit           |
|                                                                   |                    | EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4443051)      |             |                                   |       |                 |                  |         |                    |
| EP2207738-001                                                     | 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           |
| EP2207813-006                                                     | Anonymous          | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.0005                            | mg/kg | <0.0005         | <0.0005          | 0.0     | No Limit           |
|                                                                   |                    | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 27619-97-2  | 0.0005                            | mg/kg | <0.0005         | <0.0005          | 0.0     | No Limit           |
|                                                                   |                    | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | 39108-34-4  | 0.0005                            | mg/kg | <0.0005         | <0.0005          | 0.0     | No Limit           |
|                                                                   |                    | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | 120226-60-0 | 0.0005                            | mg/kg | <0.0005         | <0.0005          | 0.0     | No Limit           |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4443056)      |                    |                                                                   |             |                                   |       |                 |                  |         |                    |



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 Work Order : EP2207815  
 Client : STANTEC AUSTRALIA PTY LTD  
 Project : WA\_0960\_PFASOMP



| Sub-Matrix: <b>SOIL</b>                                                         |                    |                                                     |             | Laboratory Duplicate (DUP) Report |       |                 |                  |         |                    |
|---------------------------------------------------------------------------------|--------------------|-----------------------------------------------------|-------------|-----------------------------------|-------|-----------------|------------------|---------|--------------------|
| Laboratory sample ID                                                            | Sample ID          | Method: Compound                                    | CAS Number  | LOR                               | Unit  | Original Result | Duplicate Result | RPD (%) | Acceptable RPD (%) |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4443056) - continued</b> |                    |                                                     |             |                                   |       |                 |                  |         |                    |
| EP2207815-008                                                                   | 0960_SD304A_220623 | 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           |
| EP2207910-009                                                                   | Anonymous          | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)   | 757124-72-4 | 0.0005                            | mg/kg | <0.0005         | <0.0005          | 0.0     | No Limit           |
|                                                                                 |                    | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)   | 27619-97-2  | 0.0005                            | mg/kg | <0.0005         | <0.0005          | 0.0     | No Limit           |
|                                                                                 |                    | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)   | 39108-34-4  | 0.0005                            | mg/kg | <0.0005         | <0.0005          | 0.0     | No Limit           |
|                                                                                 |                    | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS) | 120226-60-0 | 0.0005                            | mg/kg | <0.0005         | <0.0005          | 0.0     | No Limit           |



## 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**

| Sub-Matrix: SOIL                                         |            |        |       | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |     |
|----------------------------------------------------------|------------|--------|-------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|-----|
|                                                          |            |        |       |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |     |
| Method: Compound                                         | CAS Number | LOR    | Unit  | Result                      |                                       |                           |                                   |     |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4443051)   |            |        |       |                             |                                       |                           |                                   |     |
| EP231X: Perfluorobutane sulfonic acid (PFBS)             | 375-73-5   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 96.0                      | 72.0                              | 128 |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)           | 2706-91-4  | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 105                       | 73.0                              | 123 |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)            | 355-46-4   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 100                       | 67.0                              | 130 |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)           | 375-92-8   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 104                       | 70.0                              | 132 |
| EP231X: Perfluorooctane sulfonic acid (PFOS)             | 1763-23-1  | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 106                       | 68.0                              | 136 |
| EP231X: Perfluorodecane sulfonic acid (PFDS)             | 335-77-3   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 117                       | 59.0                              | 134 |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4443056)   |            |        |       |                             |                                       |                           |                                   |     |
| EP231X: Perfluorobutane sulfonic acid (PFBS)             | 375-73-5   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 94.4                      | 72.0                              | 128 |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)           | 2706-91-4  | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 97.6                      | 73.0                              | 123 |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)            | 355-46-4   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 97.6                      | 67.0                              | 130 |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)           | 375-92-8   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 101                       | 70.0                              | 132 |
| EP231X: Perfluorooctane sulfonic acid (PFOS)             | 1763-23-1  | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 90.0                      | 68.0                              | 136 |
| EP231X: Perfluorodecane sulfonic acid (PFDS)             | 335-77-3   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 107                       | 59.0                              | 134 |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4443051) |            |        |       |                             |                                       |                           |                                   |     |
| EP231X: Perfluorobutanoic acid (PFBA)                    | 375-22-4   | 0.001  | mg/kg | <0.001                      | 0.00625 mg/kg                         | 90.2                      | 71.0                              | 135 |
| EP231X: Perfluoropentanoic acid (PFPeA)                  | 2706-90-3  | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 104                       | 69.0                              | 132 |
| EP231X: Perfluorohexanoic acid (PFHxA)                   | 307-24-4   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 106                       | 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                         | 111                       | 69.0                              | 133 |
| EP231X: Perfluorononanoic acid (PFNA)                    | 375-95-1   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 112                       | 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                         | 104                       | 64.0                              | 136 |
| EP231X: Perfluorododecanoic acid (PFDoDA)                | 307-55-1   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 108                       | 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                         | 97.8                      | 69.0                              | 133 |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4443056) |            |        |       |                             |                                       |                           |                                   |     |
| EP231X: Perfluorobutanoic acid (PFBA)                    | 375-22-4   | 0.001  | mg/kg | <0.001                      | 0.00625 mg/kg                         | 92.2                      | 71.0                              | 135 |
| EP231X: Perfluoropentanoic acid (PFPeA)                  | 2706-90-3  | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 103                       | 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                         | 99.2                      | 71.0                              | 131 |
| EP231X: Perfluorooctanoic acid (PFOA)                    | 335-67-1   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 101                       | 69.0                              | 133 |
| EP231X: Perfluorononanoic acid (PFNA)                    | 375-95-1   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 96.8                      | 72.0                              | 129 |
| EP231X: Perfluorodecanoic acid (PFDA)                    | 335-76-2   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 100                       | 69.0                              | 133 |
| EP231X: Perfluoroundecanoic acid (PFUnDA)                | 2058-94-8  | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 102                       | 64.0                              | 136 |



Sub-Matrix: **SOIL**

| Sub-Matrix: SOIL                                                     |             |        |       | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |     |
|----------------------------------------------------------------------|-------------|--------|-------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|-----|
|                                                                      |             |        |       |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |     |
| Method: Compound                                                     | CAS Number  | LOR    | Unit  | Result                      |                                       |                           |                                   |     |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4443056) - continued |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: Perfluorododecanoic acid (PFDoDA)                            | 307-55-1    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 112                       | 69.0                              | 135 |
| EP231X: Perfluorotridecanoic acid (PFTrDA)                           | 72629-94-8  | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 102                       | 66.0                              | 139 |
| EP231X: Perfluorotetradecanoic acid (PFTeDA)                         | 376-06-7    | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 97.9                      | 69.0                              | 133 |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4443051)                 |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: Perfluorooctane sulfonamide (FOSA)                           | 754-91-6    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 119                       | 67.0                              | 137 |
| EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)                | 31506-32-8  | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 109                       | 71.6                              | 129 |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)                 | 4151-50-2   | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 96.6                      | 69.8                              | 131 |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)         | 24448-09-7  | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 117                       | 68.7                              | 130 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)          | 1691-99-2   | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 99.4                      | 65.1                              | 134 |
| 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                         | 105                       | 61.0                              | 139 |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4443056)                 |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: Perfluorooctane sulfonamide (FOSA)                           | 754-91-6    | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 120                       | 67.0                              | 137 |
| EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)                | 31506-32-8  | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 112                       | 71.6                              | 129 |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)                 | 4151-50-2   | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 108                       | 69.8                              | 131 |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)         | 24448-09-7  | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 126                       | 68.7                              | 130 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)          | 1691-99-2   | 0.0005 | mg/kg | <0.0005                     | 0.00312 mg/kg                         | 93.6                      | 65.1                              | 134 |
| EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)    | 2355-31-9   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 116                       | 63.0                              | 144 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)     | 2991-50-6   | 0.0002 | mg/kg | <0.0002                     | 0.00125 mg/kg                         | 103                       | 61.0                              | 139 |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4443051)          |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                    | 757124-72-4 | 0.0005 | mg/kg | <0.0005                     | 0.00125 mg/kg                         | 104                       | 62.0                              | 145 |
| EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                    | 27619-97-2  | 0.0005 | mg/kg | <0.0005                     | 0.00125 mg/kg                         | 108                       | 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                         | 106                       | 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                         | 106                       | 69.2                              | 143 |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4443056)          |             |        |       |                             |                                       |                           |                                   |     |
| EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                    | 757124-72-4 | 0.0005 | mg/kg | <0.0005                     | 0.00125 mg/kg                         | 101                       | 62.0                              | 145 |
| EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                    | 27619-97-2  | 0.0005 | mg/kg | <0.0005                     | 0.00125 mg/kg                         | 111                       | 64.0                              | 140 |
| EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                    | 39108-34-4  | 0.0005 | mg/kg | <0.0005                     | 0.00125 mg/kg                         | 110                       | 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                         | 106                       | 69.2                              | 143 |



## 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**

| 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: 4443051)   |                    |                                                |            |                          |                  |                       |      |
| EP2207738-001                                            | Anonymous          | EP231X: Perfluorobutane sulfonic acid (PFBS)   | 375-73-5   | 0.00125 mg/kg            | 103              | 72.0                  | 128  |
|                                                          |                    | EP231X: Perfluoropentane sulfonic acid (PFPeS) | 2706-91-4  | 0.00125 mg/kg            | 104              | 73.0                  | 123  |
|                                                          |                    | EP231X: Perfluorohexane sulfonic acid (PFHxS)  | 355-46-4   | 0.00125 mg/kg            | 107              | 67.0                  | 130  |
|                                                          |                    | EP231X: Perfluoroheptane sulfonic acid (PFHpS) | 375-92-8   | 0.00125 mg/kg            | 106              | 70.0                  | 132  |
|                                                          |                    | EP231X: Perfluorooctane sulfonic acid (PFOS)   | 1763-23-1  | 0.00125 mg/kg            | 102              | 68.0                  | 136  |
|                                                          |                    | EP231X: Perfluorodecane sulfonic acid (PFDS)   | 335-77-3   | 0.00125 mg/kg            | 97.2             | 59.0                  | 134  |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4443056)   |                    |                                                |            |                          |                  |                       |      |
| EP2207815-008                                            | 0960_SD304A_220623 | EP231X: Perfluorobutane sulfonic acid (PFBS)   | 375-73-5   | 0.00125 mg/kg            | 99.6             | 72.0                  | 128  |
|                                                          |                    | EP231X: Perfluoropentane sulfonic acid (PFPeS) | 2706-91-4  | 0.00125 mg/kg            | 98.4             | 73.0                  | 123  |
|                                                          |                    | EP231X: Perfluorohexane sulfonic acid (PFHxS)  | 355-46-4   | 0.00125 mg/kg            | 97.6             | 67.0                  | 130  |
|                                                          |                    | EP231X: Perfluoroheptane sulfonic acid (PFHpS) | 375-92-8   | 0.00125 mg/kg            | 96.4             | 70.0                  | 132  |
|                                                          |                    | EP231X: Perfluorooctane sulfonic acid (PFOS)   | 1763-23-1  | 0.00125 mg/kg            | 91.6             | 68.0                  | 136  |
|                                                          |                    | EP231X: Perfluorodecane sulfonic acid (PFDS)   | 335-77-3   | 0.00125 mg/kg            | 100              | 59.0                  | 134  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4443051) |                    |                                                |            |                          |                  |                       |      |
| EP2207738-001                                            | Anonymous          | 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            | 108              | 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            | 97.2             | 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            | 116              | 72.0                  | 129  |
|                                                          |                    | EP231X: Perfluorodecanoic acid (PFDA)          | 335-76-2   | 0.00125 mg/kg            | 108              | 69.0                  | 133  |
|                                                          |                    | EP231X: Perfluoroundecanoic acid (PFUnDA)      | 2058-94-8  | 0.00125 mg/kg            | 97.2             | 64.0                  | 136  |
|                                                          |                    | EP231X: Perfluorododecanoic acid (PFDoDA)      | 307-55-1   | 0.00125 mg/kg            | 117              | 69.0                  | 135  |
|                                                          |                    | EP231X: Perfluorotridecanoic acid (PFTTrDA)    | 72629-94-8 | 0.00125 mg/kg            | 102              | 66.0                  | 139  |
|                                                          |                    | EP231X: Perfluorotetradecanoic acid (PFTeDA)   | 376-06-7   | 0.00312 mg/kg            | 95.7             | 69.0                  | 133  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4443056) |                    |                                                |            |                          |                  |                       |      |
| EP2207815-008                                            | 0960_SD304A_220623 | EP231X: Perfluorobutanoic acid (PFBA)          | 375-22-4   | 0.00625 mg/kg            | 85.7             | 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            | 99.6             | 70.0                  | 132  |
|                                                          |                    | EP231X: Perfluoroheptanoic acid (PFHpA)        | 375-85-9   | 0.00125 mg/kg            | 99.6             | 71.0                  | 131  |
|                                                          |                    | EP231X: Perfluorooctanoic acid (PFOA)          | 335-67-1   | 0.00125 mg/kg            | 101              | 69.0                  | 133  |
|                                                          |                    | EP231X: Perfluorononanoic acid (PFNA)          | 375-95-1   | 0.00125 mg/kg            | 104              | 72.0                  | 129  |
|                                                          |                    | EP231X: Perfluorodecanoic acid (PFDA)          | 335-76-2   | 0.00125 mg/kg            | 106              | 69.0                  | 133  |
|                                                          |                    | EP231X: Perfluoroundecanoic acid (PFUnDA)      | 2058-94-8  | 0.00125 mg/kg            | 106              | 64.0                  | 136  |



Sub-Matrix: **SOIL**

| 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: 4443056) - continued |                    |                                                                   |             |                          |                  |                       |      |
| EP2207815-008                                                        | 0960_SD304A_220623 | EP231X: Perfluorododecanoic acid (PFDoDA)                         | 307-55-1    | 0.00125 mg/kg            | 120              | 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            | 102              | 69.0                  | 133  |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4443051)                 |                    |                                                                   |             |                          |                  |                       |      |
| EP2207738-001                                                        | Anonymous          | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.00125 mg/kg            | 121              | 67.0                  | 137  |
|                                                                      |                    | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.00312 mg/kg            | 110              | 71.6                  | 129  |
|                                                                      |                    | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.00312 mg/kg            | 109              | 69.8                  | 131  |
|                                                                      |                    | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.00312 mg/kg            | 120              | 68.7                  | 130  |
|                                                                      |                    | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.00312 mg/kg            | 101              | 65.1                  | 134  |
|                                                                      |                    | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9   | 0.00125 mg/kg            | 111              | 63.0                  | 144  |
|                                                                      |                    | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.00125 mg/kg            | 101              | 61.0                  | 139  |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4443056)                 |                    |                                                                   |             |                          |                  |                       |      |
| EP2207815-008                                                        | 0960_SD304A_220623 | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.00125 mg/kg            | 118              | 67.0                  | 137  |
|                                                                      |                    | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.00312 mg/kg            | 101              | 71.6                  | 129  |
|                                                                      |                    | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.00312 mg/kg            | 108              | 69.8                  | 131  |
|                                                                      |                    | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.00312 mg/kg            | 124              | 68.7                  | 130  |
|                                                                      |                    | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.00312 mg/kg            | 102              | 65.1                  | 134  |
|                                                                      |                    | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9   | 0.00125 mg/kg            | 125              | 63.0                  | 144  |
|                                                                      |                    | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.00125 mg/kg            | 108              | 61.0                  | 139  |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4443051)          |                    |                                                                   |             |                          |                  |                       |      |
| EP2207738-001                                                        | Anonymous          | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.00125 mg/kg            | 97.2             | 62.0                  | 145  |
|                                                                      |                    | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 27619-97-2  | 0.00125 mg/kg            | 113              | 64.0                  | 140  |
|                                                                      |                    | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | 39108-34-4  | 0.00125 mg/kg            | 113              | 65.0                  | 137  |
|                                                                      |                    | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | 120226-60-0 | 0.00125 mg/kg            | 98.4             | 69.2                  | 143  |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4443056)          |                    |                                                                   |             |                          |                  |                       |      |
| EP2207815-008                                                        | 0960_SD304A_220623 | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.00125 mg/kg            | 100              | 62.0                  | 145  |
|                                                                      |                    | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 27619-97-2  | 0.00125 mg/kg            | 107              | 64.0                  | 140  |
|                                                                      |                    | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | 39108-34-4  | 0.00125 mg/kg            | 103              | 65.0                  | 137  |



Sub-Matrix: **SOIL**

| Sub-Matrix: <b>SOIL</b>                                                 |                    |                                                     |             | Matrix Spike (MS) Report |                  |                       |      |
|-------------------------------------------------------------------------|--------------------|-----------------------------------------------------|-------------|--------------------------|------------------|-----------------------|------|
|                                                                         |                    |                                                     |             | Spike                    | SpikeRecovery(%) | Acceptable Limits (%) |      |
|                                                                         |                    |                                                     |             | Concentration            | MS               | Low                   | High |
| Laboratory sample ID                                                    | Sample ID          | Method: Compound                                    | CAS Number  |                          |                  |                       |      |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4443056) - continued |                    |                                                     |             |                          |                  |                       |      |
| EP2207815-008                                                           | 0960_SD304A_220623 | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS) | 120226-60-0 | 0.00125 mg/kg            | 98.4             | 69.2                  | 143  |

## QA/QC Compliance Assessment to assist with Quality Review

|              |                             |                         |                                |
|--------------|-----------------------------|-------------------------|--------------------------------|
| Work Order   | : EP2207815                 | Page                    | : 1 of 5                       |
| Client       | : STANTEC AUSTRALIA PTY LTD | Laboratory              | : Environmental Division Perth |
| Contact      | : [REDACTED]                | Telephone               | : +6138549 9609                |
| Project      | : WA_0960_PFASOMP           | Date Samples Received   | : 27-Jun-2022                  |
| Site         | : Learmonth SD - [REDACTED] | Issue Date              | : 08-Jul-2022                  |
| Sampler      | : [REDACTED]                | No. of samples received | : 9                            |
| Order number | : pfas-omp Learmonth        | No. of samples analysed | : 9                            |

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

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

### Summary of Outliers

#### Outliers : Quality Control Samples

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

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- **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                                                                                                                               | Sample Date                                                                           | Extraction / Preparation |                    |             | Analysis      |                  |             |   |
|--------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|--------------------------|--------------------|-------------|---------------|------------------|-------------|---|
| Container / Client Sample ID(s)                                                                                                      |                                                                                       | Date extracted           | Due for extraction | Evaluation  | Date analysed | Due for analysis | Evaluation  |   |
| EA055: Moisture Content (Dried @ 105-110°C)                                                                                          |                                                                                       |                          |                    |             |               |                  |             |   |
| HDPE Soil Jar (EA055)<br>0960_SD211_220623,<br>0960_SD301_220623,<br>0960_SS190_220623,<br>0960_SS193_220623,<br>0960_SD304B_220623  | 0960_SD300_220623,<br>0960_SD303_220623,<br>0960_SS192_220623,<br>0960_SD304A_220623, | 23-Jun-2022              | ----               | ----        | ----          | 04-Jul-2022      | 07-Jul-2022 | ✓ |
| EP231A: Perfluoroalkyl Sulfonic Acids                                                                                                |                                                                                       |                          |                    |             |               |                  |             |   |
| HDPE Soil Jar (EP231X)<br>0960_SD211_220623,<br>0960_SD301_220623,<br>0960_SS190_220623,<br>0960_SS193_220623,<br>0960_SD304B_220623 | 0960_SD300_220623,<br>0960_SD303_220623,<br>0960_SS192_220623,<br>0960_SD304A_220623, | 23-Jun-2022              | 06-Jul-2022        | 20-Dec-2022 | ✓             | 07-Jul-2022      | 15-Aug-2022 | ✓ |
| EP231B: Perfluoroalkyl Carboxylic Acids                                                                                              |                                                                                       |                          |                    |             |               |                  |             |   |
| HDPE Soil Jar (EP231X)<br>0960_SD211_220623,<br>0960_SD301_220623,<br>0960_SS190_220623,<br>0960_SS193_220623,<br>0960_SD304B_220623 | 0960_SD300_220623,<br>0960_SD303_220623,<br>0960_SS192_220623,<br>0960_SD304A_220623, | 23-Jun-2022              | 06-Jul-2022        | 20-Dec-2022 | ✓             | 07-Jul-2022      | 15-Aug-2022 | ✓ |
| EP231C: Perfluoroalkyl Sulfonamides                                                                                                  |                                                                                       |                          |                    |             |               |                  |             |   |
| HDPE Soil Jar (EP231X)<br>0960_SD211_220623,<br>0960_SD301_220623,<br>0960_SS190_220623,<br>0960_SS193_220623,<br>0960_SD304B_220623 | 0960_SD300_220623,<br>0960_SD303_220623,<br>0960_SS192_220623,<br>0960_SD304A_220623, | 23-Jun-2022              | 06-Jul-2022        | 20-Dec-2022 | ✓             | 07-Jul-2022      | 15-Aug-2022 | ✓ |

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                                                                                                               |  | Sample Date                                                                           | Extraction / Preparation |                    |             | Analysis      |                  |             |   |
|--------------------------------------------------------------------------------------------------------------------------------------|--|---------------------------------------------------------------------------------------|--------------------------|--------------------|-------------|---------------|------------------|-------------|---|
| Container / Client Sample ID(s)                                                                                                      |  |                                                                                       | Date extracted           | Due for extraction | Evaluation  | Date analysed | Due for analysis | Evaluation  |   |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids                                                                                           |  |                                                                                       |                          |                    |             |               |                  |             |   |
| HDPE Soil Jar (EP231X)<br>0960_SD211_220623,<br>0960_SD301_220623,<br>0960_SS190_220623,<br>0960_SS193_220623,<br>0960_SD304B_220623 |  | 0960_SD300_220623,<br>0960_SD303_220623,<br>0960_SS192_220623,<br>0960_SD304A_220623, | 23-Jun-2022              | 06-Jul-2022        | 20-Dec-2022 | ✓             | 07-Jul-2022      | 15-Aug-2022 | ✓ |
| EP231P: PFAS Sums                                                                                                                    |  |                                                                                       |                          |                    |             |               |                  |             |   |
| HDPE Soil Jar (EP231X)<br>0960_SD211_220623,<br>0960_SD301_220623,<br>0960_SS190_220623,<br>0960_SS193_220623,<br>0960_SD304B_220623 |  | 0960_SD300_220623,<br>0960_SD303_220623,<br>0960_SS192_220623,<br>0960_SD304A_220623, | 23-Jun-2022              | 06-Jul-2022        | 20-Dec-2022 | ✓             | 07-Jul-2022      | 15-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                          |        | Count |         | Rate (%) |          |            | Quality Control Specification  |
|------------------------------------------------------|--------|-------|---------|----------|----------|------------|--------------------------------|
| Analytical Methods                                   | Method | QC    | Regular | Actual   | Expected | Evaluation |                                |
| Laboratory Duplicates (DUP)                          |        |       |         |          |          |            |                                |
| Moisture Content                                     | EA055  | 2     | 20      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 4     | 40      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Laboratory Control Samples (LCS)                     |        |       |         |          |          |            |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 2     | 40      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Method Blanks (MB)                                   |        |       |         |          |          |            |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 2     | 40      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Matrix Spikes (MS)                                   |        |       |         |          |          |            |                                |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS | EP231X | 2     | 40      | 5.00     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |



## Brief Method Summaries

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

| <i>Analytical Methods</i>                            | <i>Method</i> | <i>Matrix</i> | <i>Method Descriptions</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------------------------------|---------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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. |
| <i>Preparation Methods</i>                           | <i>Method</i> | <i>Matrix</i> | <i>Method Descriptions</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| QuEChERS Extraction of Solids                        | ORG71         | SOIL          | In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.                                                                                                                                                                                                                                   |

**SAMPLE RECEIPT NOTIFICATION (SRN)****Work Order : EP2207816**

Client : **STANTEC AUSTRALIA PTY LTD**  
Contact : [REDACTED]  
Address : GROUND FLOOR 226 ADELAIDE  
TERRACE  
PERTH 6000

Laboratory : Environmental Division Perth  
Contact : [REDACTED]  
Address : 26 Rigali Way Wangara Western  
Australia Australia 6065

E-mail : [REDACTED]@stantec.com  
Telephone : ----  
Facsimile : ----

E-mail : [REDACTED]@alsglobal.com  
Telephone : +6138549 9609  
Facsimile : +61-8-9406 1399

Project : WA\_0960\_PFASOMP  
Order number : pfas-omp Learmonth  
C-O-C number : 39285  
Site : Learmonth SW/OTH - [REDACTED]  
Sampler : [REDACTED]

Page : 1 of 2  
Quote number : ES2022MWHAUS0002 (SY/139/19 B)  
QC Level : NEPM 2013 B3 & ALS QC Standard

**Dates**

Date Samples Received : 27-Jun-2022 11:40  
Client Requested Due : 08-Jul-2022  
Date

Issue Date : 30-Jun-2022  
Scheduled Reporting Date : **08-Jul-2022**

**Delivery Details**

Mode of Delivery : Carrier  
No. of coolers/boxes : 5  
Receipt Detail :

Security Seal : Not Available  
Temperature : 13.4 - Ice present  
No. of samples received / analysed : 10 / 10

**General Comments**

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

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

- ### Summary of Sample(s) and Requested Analysis

Matrix: WATER

| Laboratory sample<br>ID | Sampling date /<br>time | Sample ID          | WATER<br>Ionic Ba | WATER<br>PFAS - | Major C | WATER<br>Major A |
|-------------------------|-------------------------|--------------------|-------------------|-----------------|---------|------------------|
| EP2207816-001           | 23-Jun-2022 08:38       | 0960_SW211_220623  | ✓                 | ✓               | ✓       | ✓                |
| EP2207816-002           | 23-Jun-2022 08:51       | 0960_SW300_220623  | ✓                 | ✓               | ✓       | ✓                |
| EP2207816-003           | 23-Jun-2022 09:50       | 0960_SW001_220623  | ✓                 | ✓               | ✓       | ✓                |
| EP2207816-004           | 23-Jun-2022 10:06       | 0960_SW303_220623  | ✓                 | ✓               | ✓       | ✓                |
| EP2207816-005           | 23-Jun-2022 10:26       | 0960_SW304_220623  | ✓                 | ✓               | ✓       | ✓                |
| EP2207816-006           | 23-Jun-2022 10:27       | 0960_SW305_220623  | ✓                 | ✓               | ✓       | ✓                |
| EP2207816-007           | 23-Jun-2022 12:00       | 0960_OTH103_220623 | ✓                 | ✓               | ✓       | ✓                |
| EP2207816-008           | 23-Jun-2022 12:13       | 0960_OTH129_220623 | ✓                 | ✓               | ✓       | ✓                |
| EP2207816-009           | 23-Jun-2022 00:00       | 0960_SW192_220623  | ✓                 | ✓               | ✓       | ✓                |
| EP2207816-010           | 23-Jun-2022 00:00       | 0960_SW193_220623  | ✓                 | ✓               | ✓       | ✓                |

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

Email [REDACTED]cardno.com.au

Email [derp.labreports@esdat.com.au](mailto:derp.labreports@esdat.com.au)

- [illegible]

## CERTIFICATE OF ANALYSIS

**Work Order** : **EP2207816**  
**Client** : **STANTEC AUSTRALIA PTY LTD**  
**Contact** : [REDACTED]  
**Address** : GROUND FLOOR 226 ADELAIDE TERRACE  
 PERTH 6000  
**Telephone** : ----  
**Project** : WA\_0960\_PFASOMP  
**Order number** : pfas-omp Learmonth  
**C-O-C number** : 39285  
**Sampler** : [REDACTED]  
**Site** : Learmonth SW/OTH - SC  
**Quote number** : SY/139/19 B  
**No. of samples received** : 10  
**No. of samples analysed** : 10

**Page** : 1 of 9  
**Laboratory** : Environmental Division Perth  
**Contact** : [REDACTED]  
**Address** : 26 Rigali Way Wangara Western Australia Australia 6065  
**Telephone** : +6138549 9609  
**Date Samples Received** : 27-Jun-2022 11:40  
**Date Analysis Commenced** : 28-Jun-2022  
**Issue Date** : 08-Jul-2022 14:26



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>                |
|------------------------------------------------------------------------|----------------------------|----------------------------------------------|
| Canhuang Ke                                                            | Inorganics Supervisor      | Perth Inorganics, Wangara, Western Australia |
| <span style="background-color: black; color: black;">[REDACTED]</span> | Laboratory Manager (Perth) | Perth Inorganics, Wangara, Western Australia |
| <span style="background-color: black; color: black;">[REDACTED]</span> | LCMS Coordinator           | Sydney Organics, Smithfield, NSW             |





## 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.

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- 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.
- Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, 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: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                                   |             |      |       | 0960_SW211_220623 | 0960_SW300_220623 | 0960_SW001_220623 | 0960_SW303_220623 | 0960_SW304_220623 |
|-------------------------------------------------------------------|-------------|------|-------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                              |             |      |       | 23-Jun-2022 08:38 | 23-Jun-2022 08:51 | 23-Jun-2022 09:50 | 23-Jun-2022 10:06 | 23-Jun-2022 10:26 |
| Compound                                                          | CAS Number  | LOR  | Unit  | EP2207816-001     | EP2207816-002     | EP2207816-003     | EP2207816-004     | EP2207816-005     |
|                                                                   |             |      |       | Result            | Result            | Result            | Result            | Result            |
| <b>ED037P: Alkalinity by PC Titrator</b>                          |             |      |       |                   |                   |                   |                   |                   |
| Hydroxide Alkalinity as CaCO <sub>3</sub>                         | DMO-210-001 | 1    | mg/L  | <1                | <1                | <1                | <1                | <1                |
| Carbonate Alkalinity as CaCO <sub>3</sub>                         | 3812-32-6   | 1    | mg/L  | <1                | <1                | 24                | <1                | <1                |
| Bicarbonate Alkalinity as CaCO <sub>3</sub>                       | 71-52-3     | 1    | mg/L  | 219               | 220               | 122               | 174               | 215               |
| Total Alkalinity as CaCO <sub>3</sub>                             | ----        | 1    | mg/L  | 219               | 220               | 146               | 174               | 215               |
| <b>ED041G: Sulfate (Turbidimetric) as SO<sub>4</sub> 2- by DA</b> |             |      |       |                   |                   |                   |                   |                   |
| Sulfate as SO <sub>4</sub> - Turbidimetric                        | 14808-79-8  | 1    | mg/L  | 1740              | 1760              | 2820              | 1530              | 1650              |
| <b>ED045G: Chloride by Discrete Analyser</b>                      |             |      |       |                   |                   |                   |                   |                   |
| Chloride                                                          | 16887-00-6  | 1    | mg/L  | 10900             | 11200             | 18200             | 10500             | 11300             |
| <b>ED093F: Dissolved Major Cations</b>                            |             |      |       |                   |                   |                   |                   |                   |
| Calcium                                                           | 7440-70-2   | 1    | mg/L  | 294               | 311               | 429               | 266               | 332               |
| Magnesium                                                         | 7439-95-4   | 1    | mg/L  | 856               | 914               | 1560              | 761               | 935               |
| Sodium                                                            | 7440-23-5   | 1    | mg/L  | 6180              | 6600              | 11300             | 5380              | 6640              |
| Potassium                                                         | 7440-09-7   | 1    | mg/L  | 336               | 354               | 603               | 304               | 375               |
| <b>EN055: Ionic Balance</b>                                       |             |      |       |                   |                   |                   |                   |                   |
| ∅ Total Anions                                                    | ----        | 0.01 | meq/L | 348               | 357               | 575               | 332               | 357               |
| ∅ Total Cations                                                   | ----        | 0.01 | meq/L | 362               | 387               | 657               | 318               | 392               |
| ∅ Ionic Balance                                                   | ----        | 0.01 | %     | 2.03              | 4.02              | 6.63              | 2.13              | 4.61              |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>                      |             |      |       |                   |                   |                   |                   |                   |
| 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             | 0.02              | <0.01             | 0.02              | <0.01             |
| Perfluorodecane sulfonic acid (PFDS)                              | 335-77-3    | 0.02 | µg/L  | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>                    |             |      |       |                   |                   |                   |                   |                   |
| 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             |



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_SW211_220623 | 0960_SW300_220623 | 0960_SW001_220623 | 0960_SW303_220623 | 0960_SW304_220623 |
|------------------------------------------------------------|-------------|------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                       |             |      |      | 23-Jun-2022 08:38 | 23-Jun-2022 08:51 | 23-Jun-2022 09:50 | 23-Jun-2022 10:06 | 23-Jun-2022 10:26 |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2207816-001     | EP2207816-002     | EP2207816-003     | EP2207816-004     | EP2207816-005     |
|                                                            |             |      |      | Result            | Result            | Result            | Result            | Result            |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                   |                   |                   |                   |                   |
| 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             |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                   |                   |                   |                   |                   |
| Perfluorooctane sulfonamide (FOSA)                         | 754-91-6    | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)              | 31506-32-8  | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)               | 4151-50-2   | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)       | 24448-09-7  | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)        | 1691-99-2   | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)  | 2355-31-9   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)   | 2991-50-6   | 0.02 | µg/L | <0.02             | <0.02             | <0.02             | <0.02             | <0.02             |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                   |                   |                   |                   |                   |
| 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             |



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_SW211_220623 | 0960_SW300_220623 | 0960_SW001_220623 | 0960_SW303_220623 | 0960_SW304_220623 |
|---------------------------------------------------------------|--------------------|------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Sampling date / time                                          |                    |      |      | 23-Jun-2022 08:38 | 23-Jun-2022 08:51 | 23-Jun-2022 09:50 | 23-Jun-2022 10:06 | 23-Jun-2022 10:26 |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2207816-001     | EP2207816-002     | EP2207816-003     | EP2207816-004     | EP2207816-005     |
|                                                               |                    |      |      | Result            | Result            | Result            | Result            | Result            |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                   |                   |                   |                   |                   |
| 10:2 Fluorotelomer sulfonic acid<br>(10:2 FTS)                | 120226-60-0        | 0.05 | µg/L | <0.05             | <0.05             | <0.05             | <0.05             | <0.05             |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                   |                   |                   |                   |                   |
| Sum of PFAS                                                   | ----               | 0.01 | µg/L | <0.01             | 0.02              | <0.01             | 0.02              | <0.01             |
| Sum of PFHxS and PFOS                                         | 355-46-4/1763-23-1 | 0.01 | µg/L | <0.01             | 0.02              | <0.01             | 0.02              | <0.01             |
| Sum of PFAS (WA DER List)                                     | ----               | 0.01 | µg/L | <0.01             | 0.02              | <0.01             | 0.02              | <0.01             |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                   |                   |                   |                   |                   |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 91.1              | 87.3              | 90.9              | 96.0              | 94.0              |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 100               | 97.3              | 102               | 102               | 101               |



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                                   |             |      |       | 0960_SW305_220623 | 0960_OTH103_220623 | 0960_OTH129_220623 | 0960_SW192_220623 | 0960_SW193_220623 |
|-------------------------------------------------------------------|-------------|------|-------|-------------------|--------------------|--------------------|-------------------|-------------------|
|                                                                   |             |      |       | 3                 | 3                  |                    |                   |                   |
| Sampling date / time                                              |             |      |       | 23-Jun-2022 10:27 | 23-Jun-2022 12:00  | 23-Jun-2022 12:13  | 23-Jun-2022 00:00 | 23-Jun-2022 00:00 |
| Compound                                                          | CAS Number  | LOR  | Unit  | EP2207816-006     | EP2207816-007      | EP2207816-008      | EP2207816-009     | EP2207816-010     |
|                                                                   |             |      |       | Result            | Result             | Result             | Result            | Result            |
| <b>ED037P: Alkalinity by PC Titrator</b>                          |             |      |       |                   |                    |                    |                   |                   |
| Hydroxide Alkalinity as CaCO <sub>3</sub>                         | DMO-210-001 | 1    | mg/L  | <1                | <1                 | <1                 | <1                | <1                |
| Carbonate Alkalinity as CaCO <sub>3</sub>                         | 3812-32-6   | 1    | mg/L  | <1                | <1                 | <1                 | <1                | <1                |
| Bicarbonate Alkalinity as CaCO <sub>3</sub>                       | 71-52-3     | 1    | mg/L  | 191               | 150                | 146                | 102               | 93                |
| Total Alkalinity as CaCO <sub>3</sub>                             | ----        | 1    | mg/L  | 191               | 150                | 146                | 102               | 93                |
| <b>ED041G: Sulfate (Turbidimetric) as SO<sub>4</sub> 2- by DA</b> |             |      |       |                   |                    |                    |                   |                   |
| Sulfate as SO <sub>4</sub> - Turbidimetric                        | 14808-79-8  | 1    | mg/L  | 1710              | 2480               | 2570               | 390               | 82                |
| <b>ED045G: Chloride by Discrete Analyser</b>                      |             |      |       |                   |                    |                    |                   |                   |
| Chloride                                                          | 16887-00-6  | 1    | mg/L  | 11600             | 18300              | 19500              | 2840              | 638               |
| <b>ED093F: Dissolved Major Cations</b>                            |             |      |       |                   |                    |                    |                   |                   |
| Calcium                                                           | 7440-70-2   | 1    | mg/L  | 332               | 505                | 516                | 80                | 35                |
| Magnesium                                                         | 7439-95-4   | 1    | mg/L  | 951               | 1590               | 1590               | 201               | 38                |
| Sodium                                                            | 7440-23-5   | 1    | mg/L  | 6730              | 11700              | 11700              | 1590              | 306               |
| Potassium                                                         | 7440-09-7   | 1    | mg/L  | 379               | 661                | 652                | 99                | 26                |
| <b>EN055: Ionic Balance</b>                                       |             |      |       |                   |                    |                    |                   |                   |
| ∅ Total Anions                                                    | ----        | 0.01 | meq/L | 367               | 571                | 606                | 90.3              | 21.6              |
| ∅ Total Cations                                                   | ----        | 0.01 | meq/L | 397               | 682                | 682                | 92.2              | 18.8              |
| ∅ Ionic Balance                                                   | ----        | 0.01 | %     | 4.01              | 8.86               | 5.87               | 1.07              | 6.71              |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids</b>                      |             |      |       |                   |                    |                    |                   |                   |
| Perfluorobutane sulfonic acid (PFBS)                              | 375-73-5    | 0.02 | µg/L  | <0.02             | <0.02              | <0.02              | <0.02             | <0.02             |
| Perfluoropentane sulfonic acid (PFPeS)                            | 2706-91-4   | 0.02 | µg/L  | <0.02             | <0.02              | <0.02              | <0.02             | <0.02             |
| Perfluorohexane sulfonic acid (PFHxS)                             | 355-46-4    | 0.01 | µg/L  | <0.01             | <0.01              | <0.01              | 0.02              | 0.01              |
| Perfluoroheptane sulfonic acid (PFHpS)                            | 375-92-8    | 0.02 | µg/L  | <0.02             | <0.02              | <0.02              | <0.02             | <0.02             |
| Perfluorooctane sulfonic acid (PFOS)                              | 1763-23-1   | 0.01 | µg/L  | <0.01             | <0.01              | <0.01              | 0.16              | 0.18              |
| Perfluorodecane sulfonic acid (PFDS)                              | 335-77-3    | 0.02 | µg/L  | <0.02             | <0.02              | <0.02              | <0.02             | <0.02             |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids</b>                    |             |      |       |                   |                    |                    |                   |                   |
| 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             |



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                            |             |      |      | 0960_SW305_220623 | 0960_OTH103_220623 | 0960_OTH129_220623 | 0960_SW192_220623 | 0960_SW193_220623 |
|------------------------------------------------------------|-------------|------|------|-------------------|--------------------|--------------------|-------------------|-------------------|
|                                                            |             |      |      | 3                 | 3                  | 3                  |                   |                   |
| Sampling date / time                                       |             |      |      | 23-Jun-2022 10:27 | 23-Jun-2022 12:00  | 23-Jun-2022 12:13  | 23-Jun-2022 00:00 | 23-Jun-2022 00:00 |
| Compound                                                   | CAS Number  | LOR  | Unit | EP2207816-006     | EP2207816-007      | EP2207816-008      | EP2207816-009     | EP2207816-010     |
|                                                            |             |      |      | Result            | Result             | Result             | Result            | Result            |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids - Continued</b> |             |      |      |                   |                    |                    |                   |                   |
| 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 (PFTTrDA)                        | 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             |
| <b>EP231C: Perfluoroalkyl Sulfonamides</b>                 |             |      |      |                   |                    |                    |                   |                   |
| Perfluorooctane sulfonamide (FOSA)                         | 754-91-6    | 0.02 | µg/L | <0.02             | <0.02              | <0.02              | <0.02             | <0.02             |
| N-Methyl perfluorooctane sulfonamide (MeFOSA)              | 31506-32-8  | 0.05 | µg/L | <0.05             | <0.05              | <0.05              | <0.05             | <0.05             |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA)               | 4151-50-2   | 0.05 | µg/L | <0.05             | <0.05              | <0.05              | <0.05             | <0.05             |
| N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)       | 24448-09-7  | 0.05 | µg/L | <0.05             | <0.05              | <0.05              | <0.05             | <0.05             |
| N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)        | 1691-99-2   | 0.05 | µg/L | <0.05             | <0.05              | <0.05              | <0.05             | <0.05             |
| N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)  | 2355-31-9   | 0.02 | µg/L | <0.02             | <0.02              | <0.02              | <0.02             | <0.02             |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)   | 2991-50-6   | 0.02 | µg/L | <0.02             | <0.02              | <0.02              | <0.02             | <0.02             |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids</b>          |             |      |      |                   |                    |                    |                   |                   |
| 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             |



## Analytical Results

Sub-Matrix: SURFACE WATER  
 (Matrix: WATER)

Sample ID

|                                                               |                    |      |      | 0960_SW305_220623 | 0960_OTH103_220623 | 0960_OTH129_220623 | 0960_SW192_220623 | 0960_SW193_220623 |
|---------------------------------------------------------------|--------------------|------|------|-------------------|--------------------|--------------------|-------------------|-------------------|
|                                                               |                    |      |      |                   | 3                  | 3                  |                   |                   |
| Sampling date / time                                          |                    |      |      | 23-Jun-2022 10:27 | 23-Jun-2022 12:00  | 23-Jun-2022 12:13  | 23-Jun-2022 00:00 | 23-Jun-2022 00:00 |
| Compound                                                      | CAS Number         | LOR  | Unit | EP2207816-006     | EP2207816-007      | EP2207816-008      | EP2207816-009     | EP2207816-010     |
|                                                               |                    |      |      | Result            | Result             | Result             | Result            | Result            |
| <b>EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued</b> |                    |      |      |                   |                    |                    |                   |                   |
| 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             |
| <b>EP231P: PFAS Sums</b>                                      |                    |      |      |                   |                    |                    |                   |                   |
| Sum of PFAS                                                   | ----               | 0.01 | µg/L | <0.01             | <0.01              | <0.01              | 0.18              | 0.19              |
| Sum of PFHxS and PFOS                                         | 355-46-4/1763-23-1 | 0.01 | µg/L | <0.01             | <0.01              | <0.01              | 0.18              | 0.19              |
| Sum of PFAS (WA DER List)                                     | ----               | 0.01 | µg/L | <0.01             | <0.01              | <0.01              | 0.18              | 0.19              |
| <b>EP231S: PFAS Surrogate</b>                                 |                    |      |      |                   |                    |                    |                   |                   |
| 13C4-PFOS                                                     | ----               | 0.02 | %    | 99.6              | 100                | 108                | 103               | 91.7              |
| 13C8-PFOA                                                     | ----               | 0.02 | %    | 105               | 100                | 104                | 104               | 94.9              |



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Work Order : EP2207816  
Client : STANTEC AUSTRALIA PTY LTD  
Project : WA\_0960\_PFASOMP



## Surrogate Control Limits

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

## Inter-Laboratory Testing

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

|                                |                                                           |                                |                                                                 |
|--------------------------------|-----------------------------------------------------------|--------------------------------|-----------------------------------------------------------------|
| <b>Work Order</b>              | <b>: EP2207816</b>                                        | <b>Page</b>                    | <b>: 1 of 13</b>                                                |
| <b>Client</b>                  | <b>: STANTEC AUSTRALIA PTY LTD</b>                        | <b>Laboratory</b>              | <b>: Environmental Division Perth</b>                           |
| <b>Contact</b>                 | <b>: [REDACTED]</b>                                       | <b>Contact</b>                 | <b>: [REDACTED]</b>                                             |
| <b>Address</b>                 | <b>: GROUND FLOOR 226 ADELAIDE TERRACE<br/>PERTH 6000</b> | <b>Address</b>                 | <b>: 26 Rigali Way Wangara Western Australia Australia 6065</b> |
| <b>Telephone</b>               | <b>: ----</b>                                             | <b>Telephone</b>               | <b>: +6138549 9609</b>                                          |
| <b>Project</b>                 | <b>: WA_0960_PFASOMP</b>                                  | <b>Date Samples Received</b>   | <b>: 27-Jun-2022</b>                                            |
| <b>Order number</b>            | <b>: pfas-omp Learmonth</b>                               | <b>Date Analysis Commenced</b> | <b>: 28-Jun-2022</b>                                            |
| <b>C-O-C number</b>            | <b>: 39285</b>                                            | <b>Issue Date</b>              | <b>: 08-Jul-2022</b>                                            |
| <b>Sampler</b>                 | <b>: [REDACTED]</b>                                       |                                |                                                                 |
| <b>Site</b>                    | <b>: Learmonth SW/OTH - [REDACTED]</b>                    |                                |                                                                 |
| <b>Quote number</b>            | <b>: SY/139/19 B</b>                                      |                                |                                                                 |
| <b>No. of samples received</b> | <b>: 10</b>                                               |                                |                                                                 |
| <b>No. of samples analysed</b> | <b>: 10</b>                                               |                                |                                                                 |



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>                |
|--------------------|----------------------------|----------------------------------------------|
| Canhuang Ke        | Inorganics Supervisor      | Perth Inorganics, Wangara, Western Australia |
| [REDACTED]         | Laboratory Manager (Perth) | Perth Inorganics, Wangara, Western Australia |
| [REDACTED]         | LCMS Coordinator           | Sydney Organics, Smithfield, NSW             |

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 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.

## Laboratory Duplicate (DUP) Report

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 (%) |
| <b>ED037P: Alkalinity by PC Titrator (QC Lot: 4447443)</b>               |                    |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207816-005                                                            | 0960_SW304_220623  | ED037-P: Hydroxide Alkalinity as CaCO3   | DMO-210-001 | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                          |                    | ED037-P: Carbonate Alkalinity as CaCO3   | 3812-32-6   | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                                          |                    | ED037-P: Bicarbonate Alkalinity as CaCO3 | 71-52-3     | 1                                 | mg/L | 215             | 214              | 0.5     | 0% - 20%           |
|                                                                          |                    | ED037-P: Total Alkalinity as CaCO3       | ----        | 1                                 | mg/L | 215             | 214              | 0.5     | 0% - 20%           |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4429759)</b> |                    |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207739-003                                                            | Anonymous          | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 1800            | 1810             | 0.6     | 0% - 20%           |
| EP2207812-010                                                            | Anonymous          | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 78              | 82               | 5.5     | 0% - 20%           |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4429763)</b> |                    |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207816-007                                                            | 0960_OTH103_220623 | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 2480            | 2480             | 0.2     | 0% - 20%           |
| EP2208017-021                                                            | Anonymous          | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 36              | 36               | 0.0     | 0% - 20%           |
| <b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4432630)</b> |                    |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207816-009                                                            | 0960_SW192_220623  | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 390             | 392              | 0.5     | 0% - 20%           |
| EP2208078-001                                                            | Anonymous          | ED041G: Sulfate as SO4 - Turbidimetric   | 14808-79-8  | 1                                 | mg/L | 108             | 98               | 9.0     | 0% - 20%           |
| <b>ED045G: Chloride by Discrete Analyser (QC Lot: 4429758)</b>           |                    |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207739-003                                                            | Anonymous          | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 12800           | 11800            | 8.4     | 0% - 20%           |
| EP2207812-010                                                            | Anonymous          | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 407             | 410              | 0.8     | 0% - 20%           |
| <b>ED045G: Chloride by Discrete Analyser (QC Lot: 4429762)</b>           |                    |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207816-007                                                            | 0960_OTH103_220623 | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 18300           | 18600            | 1.6     | 0% - 20%           |
| EP2208017-021                                                            | Anonymous          | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 144             | 143              | 0.0     | 0% - 20%           |
| <b>ED045G: Chloride by Discrete Analyser (QC Lot: 4432629)</b>           |                    |                                          |             |                                   |      |                 |                  |         |                    |
| EP2207816-009                                                            | 0960_SW192_220623  | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 2840            | 2840             | 0.1     | 0% - 20%           |
| EP2208078-001                                                            | Anonymous          | ED045G: Chloride                         | 16887-00-6  | 1                                 | mg/L | 503             | 487              | 3.3     | 0% - 20%           |
| <b>ED093F: Dissolved Major Cations (QC Lot: 4427082)</b>                 |                    |                                          |             |                                   |      |                 |                  |         |                    |



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 (%) |
| ED093F: Dissolved Major Cations (QC Lot: 4427082) - continued |                   |                                                |            |                                   |      |                 |                  |         |                    |
| EP2207562-001                                                 | Anonymous         | ED093F: Calcium                                | 7440-70-2  | 1                                 | mg/L | 8               | 8                | 0.0     | No Limit           |
|                                                               |                   | ED093F: Magnesium                              | 7439-95-4  | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
|                                                               |                   | ED093F: Sodium                                 | 7440-23-5  | 1                                 | mg/L | 2               | 2                | 0.0     | No Limit           |
|                                                               |                   | ED093F: Potassium                              | 7440-09-7  | 1                                 | mg/L | <1              | <1               | 0.0     | No Limit           |
| EP2207563-009                                                 | Anonymous         | ED093F: Calcium                                | 7440-70-2  | 1                                 | mg/L | 566             | 546              | 3.5     | 0% - 20%           |
|                                                               |                   | ED093F: Magnesium                              | 7439-95-4  | 1                                 | mg/L | 1010            | 973              | 4.2     | 0% - 20%           |
|                                                               |                   | ED093F: Sodium                                 | 7440-23-5  | 1                                 | mg/L | 8280            | 7940             | 4.3     | 0% - 20%           |
|                                                               |                   | ED093F: Potassium                              | 7440-09-7  | 1                                 | mg/L | 373             | 357              | 4.5     | 0% - 20%           |
| ED093F: Dissolved Major Cations (QC Lot: 4427083)             |                   |                                                |            |                                   |      |                 |                  |         |                    |
| EP2207816-005                                                 | 0960_SW304_220623 | ED093F: Calcium                                | 7440-70-2  | 1                                 | mg/L | 332             | 326              | 1.6     | 0% - 20%           |
|                                                               |                   | ED093F: Magnesium                              | 7439-95-4  | 1                                 | mg/L | 935             | 920              | 1.6     | 0% - 20%           |
|                                                               |                   | ED093F: Sodium                                 | 7440-23-5  | 1                                 | mg/L | 6640            | 6540             | 1.5     | 0% - 20%           |
|                                                               |                   | ED093F: Potassium                              | 7440-09-7  | 1                                 | mg/L | 375             | 368              | 1.8     | 0% - 20%           |
| EP2207946-021                                                 | Anonymous         | ED093F: Calcium                                | 7440-70-2  | 1                                 | mg/L | 69              | 69               | 0.0     | 0% - 20%           |
|                                                               |                   | ED093F: Magnesium                              | 7439-95-4  | 1                                 | mg/L | 60              | 60               | 0.0     | 0% - 20%           |
|                                                               |                   | ED093F: Sodium                                 | 7440-23-5  | 1                                 | mg/L | 111             | 111              | 0.0     | 0% - 20%           |
|                                                               |                   | ED093F: Potassium                              | 7440-09-7  | 1                                 | mg/L | 17              | 16               | 0.0     | 0% - 50%           |
| ED093F: Dissolved Major Cations (QC Lot: 4432488)             |                   |                                                |            |                                   |      |                 |                  |         |                    |
| EP2207816-009                                                 | 0960_SW192_220623 | ED093F: Calcium                                | 7440-70-2  | 1                                 | mg/L | 80              | 81               | 1.4     | 0% - 20%           |
|                                                               |                   | ED093F: Magnesium                              | 7439-95-4  | 1                                 | mg/L | 201             | 202              | 0.6     | 0% - 20%           |
|                                                               |                   | ED093F: Sodium                                 | 7440-23-5  | 1                                 | mg/L | 1590            | 1610             | 1.2     | 0% - 20%           |
|                                                               |                   | ED093F: Potassium                              | 7440-09-7  | 1                                 | mg/L | 99              | 101              | 2.3     | 0% - 20%           |
| EP2208076-003                                                 | Anonymous         | ED093F: Calcium                                | 7440-70-2  | 1                                 | mg/L | 78              | 80               | 1.9     | 0% - 20%           |
|                                                               |                   | ED093F: Magnesium                              | 7439-95-4  | 1                                 | mg/L | 59              | 61               | 2.9     | 0% - 20%           |
|                                                               |                   | ED093F: Sodium                                 | 7440-23-5  | 1                                 | mg/L | 635             | 653              | 2.8     | 0% - 20%           |
|                                                               |                   | ED093F: Potassium                              | 7440-09-7  | 1                                 | mg/L | 72              | 74               | 2.1     | 0% - 20%           |
| EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4439369)       |                   |                                                |            |                                   |      |                 |                  |         |                    |
| EP2207812-001                                                 | 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 | 0.14            | 0.14             | 0.0     | 0% - 50%           |
|                                                               |                   | EP231X: Perfluorobutane sulfonic acid (PFBS)   | 375-73-5   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                               |                   | EP231X: Perfluoropentane sulfonic acid (PFPeS) | 2706-91-4  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                               |                   | EP231X: Perfluoroheptane sulfonic acid (PFHpS) | 375-92-8   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                               |                   | EP231X: Perfluorodecane sulfonic acid (PFDS)   | 335-77-3   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
| EP2207812-012                                                 | Anonymous         | EP231X: Perfluorohexane sulfonic acid (PFHxS)  | 355-46-4   | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
|                                                               |                   | EP231X: Perfluorooctane sulfonic acid (PFOS)   | 1763-23-1  | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
|                                                               |                   | EP231X: Perfluorobutane sulfonic acid (PFBS)   | 375-73-5   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                               |                   | EP231X: Perfluoropentane sulfonic acid (PFPeS) | 2706-91-4  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                               |                   | EP231X: Perfluoroheptane sulfonic acid (PFHpS) | 375-92-8   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                               |                   | EP231X: Perfluorodecane sulfonic acid (PFDS)   | 335-77-3   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |



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: 4440297)   |                    |                                                |            |                                   |      |                 |                  |         |                    |
| EP2207816-008                                             | 0960_OTH129_220623 | 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           |
| ES2222761-002                                             | Anonymous          | EP231X: Perfluorohexane sulfonic acid (PFHxS)  | 355-46-4   | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
|                                                           |                    | EP231X: Perfluorooctane sulfonic acid (PFOS)   | 1763-23-1  | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
|                                                           |                    | EP231X: Perfluorobutane sulfonic acid (PFBS)   | 375-73-5   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |                    | EP231X: Perfluoropentane sulfonic acid (PFPeS) | 2706-91-4  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |                    | EP231X: Perfluoroheptane sulfonic acid (PFHpS) | 375-92-8   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |                    | EP231X: Perfluorodecane sulfonic acid (PFDS)   | 335-77-3   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
| EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4439369) |                    |                                                |            |                                   |      |                 |                  |         |                    |
| EP2207812-001                                             | 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 (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           |
| EP2207812-012                                             | Anonymous          | EP231X: Perfluorooctanoic acid (PFOA)          | 335-67-1   | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
|                                                           |                    | EP231X: Perfluoropentanoic acid (PFPeA)        | 2706-90-3  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |                    | EP231X: Perfluorohexanoic acid (PFHxA)         | 307-24-4   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |                    | EP231X: Perfluoroheptanoic acid (PFHpA)        | 375-85-9   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |                    | EP231X: Perfluorononanoic acid (PFNA)          | 375-95-1   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |                    | EP231X: Perfluorodecanoic acid (PFDA)          | 335-76-2   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |                    | EP231X: Perfluoroundecanoic acid (PFUnDA)      | 2058-94-8  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |                    | EP231X: Perfluorododecanoic acid (PFDoDA)      | 307-55-1   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                           |                    | EP231X: Perfluorotridecanoic acid (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: 4440297) |                    |                                                |            |                                   |      |                 |                  |         |                    |
| EP2207816-008                                             | 0960_OTH129_220623 | 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**

| Sub-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: 4440297) - continued |                    |                                                                   |            |                                   |      |                 |                  |         |                    |
| EP2207816-008                                                         | 0960_OTH129_220623 | 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           |
| ES2222761-002                                                         | Anonymous          | EP231X: Perfluorooctanoic acid (PFOA)                             | 335-67-1   | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
|                                                                       |                    | EP231X: Perfluoropentanoic acid (PFPeA)                           | 2706-90-3  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |                    | EP231X: Perfluorohexanoic acid (PFHxA)                            | 307-24-4   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |                    | EP231X: Perfluoroheptanoic acid (PFHpA)                           | 375-85-9   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |                    | EP231X: Perfluorononanoic acid (PFNA)                             | 375-95-1   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |                    | EP231X: Perfluorodecanoic acid (PFDA)                             | 335-76-2   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |                    | EP231X: Perfluoroundecanoic acid (PFUnDA)                         | 2058-94-8  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |                    | EP231X: Perfluorododecanoic acid (PFDoDA)                         | 307-55-1   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |                    | EP231X: Perfluorotridecanoic acid (PFTrDA)                        | 72629-94-8 | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |                    | EP231X: Perfluorotetradecanoic acid (PFTeDA)                      | 376-06-7   | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                       |                    | EP231X: Perfluorobutanoic acid (PFBA)                             | 375-22-4   | 0.1                               | µg/L | <0.1            | <0.1             | 0.0     | No Limit           |
| EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4439369)                 |                    |                                                                   |            |                                   |      |                 |                  |         |                    |
| EP2207812-001                                                         | Anonymous          | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |                    | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |                    | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |                    | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8 | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                       |                    | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                       |                    | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7 | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                       |                    | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
| EP2207812-012                                                         | Anonymous          | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |                    | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |                    | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6  | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                       |                    | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8 | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                       |                    | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |



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 (%) |
| EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4439369) - continued |                    |                                                                   |             |                                   |      |                 |                  |         |                    |
| EP2207812-012                                                     | Anonymous          | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |                    | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
| EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4440297)             |                    |                                                                   |             |                                   |      |                 |                  |         |                    |
| EP2207816-008                                                     | 0960_OTH129_220623 | 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           |
| ES2222761-002                                                     | Anonymous          | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6    | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                   |                    | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                   |                    | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.02                              | µg/L | <0.02           | <0.02            | 0.0     | No Limit           |
|                                                                   |                    | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |                    | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2   | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |                    | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                   |                    | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4439369)      |                    |                                                                   |             |                                   |      |                 |                  |         |                    |
| EP2207812-001                                                     | 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           |





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 (%) |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4439369) - continued |                    |                                                     |             |                                   |      |                 |                  |         |                    |
| EP2207812-012                                                            | Anonymous          | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)   | 757124-72-4 | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                          |                    | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)   | 27619-97-2  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                          |                    | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)   | 39108-34-4  | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                          |                    | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS) | 120226-60-0 | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4440297)             |                    |                                                     |             |                                   |      |                 |                  |         |                    |
| EP2207816-008                                                            | 0960_OTH129_220623 | 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           |
| ES2222761-002                                                            | Anonymous          | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)   | 757124-72-4 | 0.05                              | µg/L | <0.05           | <0.05            | 0.0     | No Limit           |
|                                                                          |                    | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)   | 27619-97-2  | 0.05                              | µg/L | 0.10            | 0.10             | 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: 4439369)                                      |                    |                                                     |             |                                   |      |                 |                  |         |                    |
| EP2207812-001                                                            | Anonymous          | EP231X: Sum of PFAS                                 | ----        | 0.01                              | µg/L | 0.14            | 0.14             | 0.0     | 0% - 50%           |
| EP2207812-012                                                            | Anonymous          | EP231X: Sum of PFAS                                 | ----        | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
| EP231P: PFAS Sums (QC Lot: 4440297)                                      |                    |                                                     |             |                                   |      |                 |                  |         |                    |
| EP2207816-008                                                            | 0960_OTH129_220623 | EP231X: Sum of PFAS                                 | ----        | 0.01                              | µg/L | <0.01           | <0.01            | 0.0     | No Limit           |
| ES2222761-002                                                            | Anonymous          | EP231X: Sum of PFAS                                 | ----        | 0.01                              | µg/L | 0.10            | 0.10             | 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**

| Sub-Matrix: WATER                                                |            |     |      | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                    |                       |      |
|------------------------------------------------------------------|------------|-----|------|-----------------------------|---------------------------------------|--------------------|-----------------------|------|
|                                                                  |            |     |      |                             | Spike<br>Concentration                | Spike Recovery (%) | Acceptable Limits (%) |      |
| Method: Compound                                                 | CAS Number | LOR | Unit | Result                      |                                       | LCS                | Low                   | High |
| ED037P: Alkalinity by PC Titrator (QCLot: 4447443)               |            |     |      |                             |                                       |                    |                       |      |
| ED037-P: Hydroxide Alkalinity as CaCO3                           | DMO-210-00 | 1   | mg/L | <1                          | ----                                  | ----               | ----                  | ---- |
|                                                                  | 1          |     |      |                             |                                       |                    |                       |      |
| ED037-P: Carbonate Alkalinity as CaCO3                           | 3812-32-6  | 1   | mg/L | <1                          | ----                                  | ----               | ----                  | ---- |
| ED037-P: Bicarbonate Alkalinity as CaCO3                         | 71-52-3    | 1   | mg/L | <1                          | ----                                  | ----               | ----                  | ---- |
| ED037-P: Total Alkalinity as CaCO3                               | ----       | 1   | mg/L | <1                          | 20 mg/L                               | 109                | 87.8                  | 118  |
|                                                                  |            |     |      | <1                          | 200 mg/L                              | 97.8               | 87.8                  | 118  |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4429759) |            |     |      |                             |                                       |                    |                       |      |
| ED041G: Sulfate as SO4 - Turbidimetric                           | 14808-79-8 | 1   | mg/L | <1                          | 25 mg/L                               | 96.1               | 89.9                  | 112  |
|                                                                  |            |     |      | <1                          | 500 mg/L                              | 103                | 89.9                  | 112  |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4429763) |            |     |      |                             |                                       |                    |                       |      |
| ED041G: Sulfate as SO4 - Turbidimetric                           | 14808-79-8 | 1   | mg/L | <1                          | 25 mg/L                               | 95.6               | 89.9                  | 112  |
|                                                                  |            |     |      | <1                          | 500 mg/L                              | 95.5               | 89.9                  | 112  |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4432630) |            |     |      |                             |                                       |                    |                       |      |
| ED041G: Sulfate as SO4 - Turbidimetric                           | 14808-79-8 | 1   | mg/L | <1                          | 25 mg/L                               | 102                | 89.9                  | 112  |
|                                                                  |            |     |      | <1                          | 500 mg/L                              | 102                | 89.9                  | 112  |
| ED045G: Chloride by Discrete Analyser (QCLot: 4429758)           |            |     |      |                             |                                       |                    |                       |      |
| ED045G: Chloride                                                 | 16887-00-6 | 1   | mg/L | <1                          | 10 mg/L                               | 109                | 88.6                  | 113  |
|                                                                  |            |     |      | <1                          | 1000 mg/L                             | 102                | 88.6                  | 113  |
| ED045G: Chloride by Discrete Analyser (QCLot: 4429762)           |            |     |      |                             |                                       |                    |                       |      |
| ED045G: Chloride                                                 | 16887-00-6 | 1   | mg/L | <1                          | 10 mg/L                               | 97.1               | 88.6                  | 113  |
|                                                                  |            |     |      | <1                          | 1000 mg/L                             | 96.4               | 88.6                  | 113  |
| ED045G: Chloride by Discrete Analyser (QCLot: 4432629)           |            |     |      |                             |                                       |                    |                       |      |
| ED045G: Chloride                                                 | 16887-00-6 | 1   | mg/L | <1                          | 10 mg/L                               | 109                | 88.6                  | 113  |
|                                                                  |            |     |      | <1                          | 1000 mg/L                             | 101                | 88.6                  | 113  |
| ED093F: Dissolved Major Cations (QCLot: 4427082)                 |            |     |      |                             |                                       |                    |                       |      |
| ED093F: Calcium                                                  | 7440-70-2  | 1   | mg/L | <1                          | 50 mg/L                               | 98.8               | 86.5                  | 117  |
| ED093F: Magnesium                                                | 7439-95-4  | 1   | mg/L | <1                          | 50 mg/L                               | 96.7               | 88.4                  | 110  |
| ED093F: Sodium                                                   | 7440-23-5  | 1   | mg/L | <1                          | 50 mg/L                               | 108                | 91.4                  | 113  |
| ED093F: Potassium                                                | 7440-09-7  | 1   | mg/L | <1                          | 50 mg/L                               | 90.2               | 84.6                  | 108  |
| ED093F: Dissolved Major Cations (QCLot: 4427083)                 |            |     |      |                             |                                       |                    |                       |      |
| ED093F: Calcium                                                  | 7440-70-2  | 1   | mg/L | <1                          | 50 mg/L                               | 99.7               | 86.5                  | 117  |
| ED093F: Magnesium                                                | 7439-95-4  | 1   | mg/L | <1                          | 50 mg/L                               | 98.5               | 88.4                  | 110  |
| ED093F: Sodium                                                   | 7440-23-5  | 1   | mg/L | <1                          | 50 mg/L                               | 109                | 91.4                  | 113  |
| ED093F: Potassium                                                | 7440-09-7  | 1   | mg/L | <1                          | 50 mg/L                               | 91.2               | 84.6                  | 108  |



Sub-Matrix: **WATER**

| Method: Compound                                                |            |      |      | Method Blank (MB)<br>Report<br>Result | Laboratory Control Spike (LCS) Report |                           |                       |      |
|-----------------------------------------------------------------|------------|------|------|---------------------------------------|---------------------------------------|---------------------------|-----------------------|------|
|                                                                 |            |      |      |                                       | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%) |      |
|                                                                 |            |      |      |                                       |                                       |                           | Low                   | High |
| CAS Number                                                      | LOR        | Unit |      |                                       |                                       |                           |                       |      |
| <b>ED093F: Dissolved Major Cations (QCLot: 4432488)</b>         |            |      |      |                                       |                                       |                           |                       |      |
| ED093F: Calcium                                                 | 7440-70-2  | 1    | mg/L | <1                                    | 50 mg/L                               | 102                       | 86.5                  | 117  |
| ED093F: Magnesium                                               | 7439-95-4  | 1    | mg/L | <1                                    | 50 mg/L                               | 103                       | 88.4                  | 110  |
| ED093F: Sodium                                                  | 7440-23-5  | 1    | mg/L | <1                                    | 50 mg/L                               | 110                       | 91.4                  | 113  |
| ED093F: Potassium                                               | 7440-09-7  | 1    | mg/L | <1                                    | 50 mg/L                               | 98.5                      | 84.6                  | 108  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4439369)</b>   |            |      |      |                                       |                                       |                           |                       |      |
| EP231X: Perfluorobutane sulfonic acid (PFBS)                    | 375-73-5   | 0.02 | µg/L | <0.02                                 | 0.25 µg/L                             | 127                       | 72.0                  | 130  |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)                  | 2706-91-4  | 0.02 | µg/L | <0.02                                 | 0.25 µg/L                             | 120                       | 71.0                  | 127  |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)                   | 355-46-4   | 0.01 | µg/L | <0.01                                 | 0.25 µg/L                             | 118                       | 68.0                  | 131  |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)                  | 375-92-8   | 0.02 | µg/L | <0.02                                 | 0.25 µg/L                             | 125                       | 69.0                  | 134  |
| EP231X: Perfluorooctane sulfonic acid (PFOS)                    | 1763-23-1  | 0.01 | µg/L | <0.01                                 | 0.25 µg/L                             | 114                       | 65.0                  | 140  |
| EP231X: Perfluorodecane sulfonic acid (PFDS)                    | 335-77-3   | 0.02 | µg/L | <0.02                                 | 0.25 µg/L                             | 127                       | 53.0                  | 142  |
| <b>EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4440297)</b>   |            |      |      |                                       |                                       |                           |                       |      |
| EP231X: Perfluorobutane sulfonic acid (PFBS)                    | 375-73-5   | 0.02 | µg/L | <0.02                                 | 0.25 µg/L                             | 110                       | 72.0                  | 130  |
| EP231X: Perfluoropentane sulfonic acid (PFPeS)                  | 2706-91-4  | 0.02 | µg/L | <0.02                                 | 0.25 µg/L                             | 110                       | 71.0                  | 127  |
| EP231X: Perfluorohexane sulfonic acid (PFHxS)                   | 355-46-4   | 0.01 | µg/L | <0.01                                 | 0.25 µg/L                             | 101                       | 68.0                  | 131  |
| EP231X: Perfluoroheptane sulfonic acid (PFHpS)                  | 375-92-8   | 0.02 | µg/L | <0.02                                 | 0.25 µg/L                             | 109                       | 69.0                  | 134  |
| EP231X: Perfluorooctane sulfonic acid (PFOS)                    | 1763-23-1  | 0.01 | µg/L | <0.01                                 | 0.25 µg/L                             | 106                       | 65.0                  | 140  |
| EP231X: Perfluorodecane sulfonic acid (PFDS)                    | 335-77-3   | 0.02 | µg/L | <0.02                                 | 0.25 µg/L                             | 103                       | 53.0                  | 142  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4439369)</b> |            |      |      |                                       |                                       |                           |                       |      |
| 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                             | 126                       | 72.0                  | 129  |
| EP231X: Perfluorohexanoic acid (PFHxA)                          | 307-24-4   | 0.02 | µg/L | <0.02                                 | 0.25 µg/L                             | 125                       | 72.0                  | 129  |
| EP231X: Perfluoroheptanoic acid (PFHpA)                         | 375-85-9   | 0.02 | µg/L | <0.02                                 | 0.25 µg/L                             | 117                       | 72.0                  | 130  |
| EP231X: Perfluorooctanoic acid (PFOA)                           | 335-67-1   | 0.01 | µg/L | <0.01                                 | 0.25 µg/L                             | 132                       | 71.0                  | 133  |
| EP231X: Perfluorononanoic acid (PFNA)                           | 375-95-1   | 0.02 | µg/L | <0.02                                 | 0.25 µg/L                             | 129                       | 69.0                  | 130  |
| EP231X: Perfluorodecanoic acid (PFDA)                           | 335-76-2   | 0.02 | µg/L | <0.02                                 | 0.25 µg/L                             | 116                       | 71.0                  | 129  |
| EP231X: Perfluoroundecanoic acid (PFUnDA)                       | 2058-94-8  | 0.02 | µg/L | <0.02                                 | 0.25 µg/L                             | 127                       | 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 (PFTriDA)                     | 72629-94-8 | 0.02 | µg/L | <0.02                                 | 0.25 µg/L                             | 126                       | 65.0                  | 144  |
| EP231X: Perfluorotetradecanoic acid (PFTeDA)                    | 376-06-7   | 0.05 | µg/L | <0.05                                 | 0.625 µg/L                            | 122                       | 71.0                  | 132  |
| <b>EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4440297)</b> |            |      |      |                                       |                                       |                           |                       |      |
| 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                             | 111                       | 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                             | 114                       | 72.0                  | 130  |
| EP231X: Perfluorooctanoic acid (PFOA)                           | 335-67-1   | 0.01 | µg/L | <0.01                                 | 0.25 µg/L                             | 117                       | 71.0                  | 133  |
| EP231X: Perfluorononanoic acid (PFNA)                           | 375-95-1   | 0.02 | µg/L | <0.02                                 | 0.25 µg/L                             | 120                       | 69.0                  | 130  |
| EP231X: Perfluorodecanoic acid (PFDA)                           | 335-76-2   | 0.02 | µg/L | <0.02                                 | 0.25 µg/L                             | 114                       | 71.0                  | 129  |



Sub-Matrix: **WATER**

| Sub-Matrix: WATER                                                    |             |      |      | Method Blank (MB)<br>Report | Laboratory Control Spike (LCS) Report |                           |                                   |     |
|----------------------------------------------------------------------|-------------|------|------|-----------------------------|---------------------------------------|---------------------------|-----------------------------------|-----|
|                                                                      |             |      |      |                             | Spike<br>Concentration                | Spike Recovery (%)<br>LCS | Acceptable Limits (%)<br>Low High |     |
| Method: Compound                                                     | CAS Number  | LOR  | Unit | Result                      |                                       |                           |                                   |     |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4440297) - continued |             |      |      |                             |                                       |                           |                                   |     |
| EP231X: Perfluoroundecanoic acid (PFUnDA)                            | 2058-94-8   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 109                       | 69.0                              | 133 |
| EP231X: Perfluorododecanoic acid (PFDoDA)                            | 307-55-1    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 114                       | 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                            | 105                       | 71.0                              | 132 |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4439369)                 |             |      |      |                             |                                       |                           |                                   |     |
| EP231X: Perfluorooctane sulfonamide (FOSA)                           | 754-91-6    | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 134                       | 67.0                              | 137 |
| EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)                | 31506-32-8  | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 126                       | 68.0                              | 141 |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)                 | 4151-50-2   | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 116                       | 62.6                              | 147 |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)         | 24448-09-7  | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 116                       | 66.0                              | 145 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)          | 1691-99-2   | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 114                       | 57.6                              | 145 |
| 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                             | 122                       | 61.0                              | 135 |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4440297)                 |             |      |      |                             |                                       |                           |                                   |     |
| 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                            | 108                       | 68.0                              | 141 |
| EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)                 | 4151-50-2   | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 110                       | 62.6                              | 147 |
| EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)         | 24448-09-7  | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 103                       | 66.0                              | 145 |
| EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)          | 1691-99-2   | 0.05 | µg/L | <0.05                       | 0.625 µg/L                            | 108                       | 57.6                              | 145 |
| EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)    | 2355-31-9   | 0.02 | µg/L | <0.02                       | 0.25 µg/L                             | 119                       | 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: 4439369)          |             |      |      |                             |                                       |                           |                                   |     |
| EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                    | 757124-72-4 | 0.05 | µg/L | <0.05                       | 0.25 µg/L                             | 129                       | 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                             | 120                       | 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                             | 135                       | 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                             | 136                       | 71.4                              | 144 |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4440297)          |             |      |      |                             |                                       |                           |                                   |     |
| EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                    | 757124-72-4 | 0.05 | µg/L | <0.05                       | 0.25 µg/L                             | 114                       | 63.0                              | 143 |
| EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                    | 27619-97-2  | 0.05 | µg/L | <0.05                       | 0.25 µg/L                             | 115                       | 64.0                              | 140 |
| EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                    | 39108-34-4  | 0.05 | µg/L | <0.05                       | 0.25 µg/L                             | 117                       | 67.0                              | 138 |
| EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)                  | 120226-60-0 | 0.05 | µg/L | <0.05                       | 0.25 µg/L                             | 107                       | 71.4                              | 144 |



## Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

| Sub-Matrix: WATER                                                |                    |                                                |            | Matrix Spike (MS) Report |                  |                       |      |
|------------------------------------------------------------------|--------------------|------------------------------------------------|------------|--------------------------|------------------|-----------------------|------|
|                                                                  |                    |                                                |            | Spike                    | SpikeRecovery(%) | Acceptable Limits (%) |      |
| Laboratory sample ID                                             | Sample ID          | Method: Compound                               | CAS Number | Concentration            | MS               | Low                   | High |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4429759) |                    |                                                |            |                          |                  |                       |      |
| EP2207739-003                                                    | Anonymous          | ED041G: Sulfate as SO4 - Turbidimetric         | 14808-79-8 | 100 mg/L                 | # Not Determined | 70.4                  | 130  |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4429763) |                    |                                                |            |                          |                  |                       |      |
| EP2207816-007                                                    | 0960_OTH103_220623 | ED041G: Sulfate as SO4 - Turbidimetric         | 14808-79-8 | 100 mg/L                 | # Not Determined | 70.4                  | 130  |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4432630) |                    |                                                |            |                          |                  |                       |      |
| EP2207816-009                                                    | 0960_SW192_220623  | ED041G: Sulfate as SO4 - Turbidimetric         | 14808-79-8 | 100 mg/L                 | 91.2             | 70.4                  | 130  |
| ED045G: Chloride by Discrete Analyser (QCLot: 4429758)           |                    |                                                |            |                          |                  |                       |      |
| EP2207739-003                                                    | Anonymous          | ED045G: Chloride                               | 16887-00-6 | 1000 mg/L                | # Not Determined | 70.0                  | 130  |
| ED045G: Chloride by Discrete Analyser (QCLot: 4429762)           |                    |                                                |            |                          |                  |                       |      |
| EP2207816-007                                                    | 0960_OTH103_220623 | ED045G: Chloride                               | 16887-00-6 | 1000 mg/L                | # Not Determined | 70.0                  | 130  |
| ED045G: Chloride by Discrete Analyser (QCLot: 4432629)           |                    |                                                |            |                          |                  |                       |      |
| EP2207816-009                                                    | 0960_SW192_220623  | ED045G: Chloride                               | 16887-00-6 | 1000 mg/L                | 108              | 70.0                  | 130  |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4439369)           |                    |                                                |            |                          |                  |                       |      |
| EP2207812-003                                                    | Anonymous          | EP231X: Perfluorobutane sulfonic acid (PFBS)   | 375-73-5   | 0.25 µg/L                | 114              | 72.0                  | 130  |
|                                                                  |                    | EP231X: Perfluoropentane sulfonic acid (PFPeS) | 2706-91-4  | 0.25 µg/L                | 127              | 71.0                  | 127  |
|                                                                  |                    | EP231X: Perfluorohexane sulfonic acid (PFHxS)  | 355-46-4   | 0.25 µg/L                | 126              | 68.0                  | 131  |
|                                                                  |                    | EP231X: Perfluoroheptane sulfonic acid (PFHpS) | 375-92-8   | 0.25 µg/L                | 134              | 69.0                  | 134  |
|                                                                  |                    | EP231X: Perfluorooctane sulfonic acid (PFOS)   | 1763-23-1  | 0.25 µg/L                | 130              | 65.0                  | 140  |
|                                                                  |                    | EP231X: Perfluorodecane sulfonic acid (PFDS)   | 335-77-3   | 0.25 µg/L                | 131              | 53.0                  | 142  |
| EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4440297)           |                    |                                                |            |                          |                  |                       |      |
| ES2222761-001                                                    | Anonymous          | EP231X: Perfluorobutane sulfonic acid (PFBS)   | 375-73-5   | 0.25 µg/L                | 113              | 72.0                  | 130  |
|                                                                  |                    | EP231X: Perfluoropentane sulfonic acid (PFPeS) | 2706-91-4  | 0.25 µg/L                | 108              | 71.0                  | 127  |
|                                                                  |                    | EP231X: Perfluorohexane sulfonic acid (PFHxS)  | 355-46-4   | 0.25 µg/L                | 102              | 68.0                  | 131  |
|                                                                  |                    | EP231X: Perfluoroheptane sulfonic acid (PFHpS) | 375-92-8   | 0.25 µg/L                | 106              | 69.0                  | 134  |
|                                                                  |                    | EP231X: Perfluorooctane sulfonic acid (PFOS)   | 1763-23-1  | 0.25 µg/L                | 104              | 65.0                  | 140  |
|                                                                  |                    | EP231X: Perfluorodecane sulfonic acid (PFDS)   | 335-77-3   | 0.25 µg/L                | 105              | 53.0                  | 142  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4439369)         |                    |                                                |            |                          |                  |                       |      |
| EP2207812-003                                                    | Anonymous          | EP231X: Perfluorobutanoic acid (PFBA)          | 375-22-4   | 1.25 µg/L                | 118              | 73.0                  | 129  |
|                                                                  |                    | EP231X: Perfluoropentanoic acid (PFPeA)        | 2706-90-3  | 0.25 µg/L                | 122              | 72.0                  | 129  |



Sub-Matrix: **WATER**

| 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: 4439369) - continued |           |                                                                   |            |                          |                  |                       |      |
| EP2207812-003                                                        | Anonymous | EP231X: Perfluorohexanoic acid (PFHxA)                            | 307-24-4   | 0.25 µg/L                | 119              | 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                | 122              | 71.0                  | 133  |
|                                                                      |           | EP231X: Perfluorononanoic acid (PFNA)                             | 375-95-1   | 0.25 µg/L                | 120              | 69.0                  | 130  |
|                                                                      |           | EP231X: Perfluorodecanoic acid (PFDA)                             | 335-76-2   | 0.25 µg/L                | 123              | 71.0                  | 129  |
|                                                                      |           | EP231X: Perfluoroundecanoic acid (PFUnDA)                         | 2058-94-8  | 0.25 µg/L                | 131              | 69.0                  | 133  |
|                                                                      |           | EP231X: Perfluorododecanoic acid (PFDoDA)                         | 307-55-1   | 0.25 µg/L                | 116              | 72.0                  | 134  |
|                                                                      |           | EP231X: Perfluorotridecanoic acid (PFTrDA)                        | 72629-94-8 | 0.25 µg/L                | 129              | 65.0                  | 144  |
|                                                                      |           | EP231X: Perfluorotetradecanoic acid (PFTeDA)                      | 376-06-7   | 0.625 µg/L               | 127              | 71.0                  | 132  |
| EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4440297)             |           |                                                                   |            |                          |                  |                       |      |
| ES2222761-001                                                        | Anonymous | EP231X: Perfluorobutanoic acid (PFBA)                             | 375-22-4   | 1.25 µg/L                | 97.7             | 73.0                  | 129  |
|                                                                      |           | EP231X: Perfluoropentanoic acid (PFPeA)                           | 2706-90-3  | 0.25 µg/L                | 112              | 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                | 111              | 72.0                  | 130  |
|                                                                      |           | EP231X: Perfluorooctanoic acid (PFOA)                             | 335-67-1   | 0.25 µg/L                | 111              | 71.0                  | 133  |
|                                                                      |           | EP231X: Perfluorononanoic acid (PFNA)                             | 375-95-1   | 0.25 µg/L                | 121              | 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                | 115              | 72.0                  | 134  |
|                                                                      |           | EP231X: Perfluorotridecanoic acid (PFTrDA)                        | 72629-94-8 | 0.25 µg/L                | 109              | 65.0                  | 144  |
|                                                                      |           | EP231X: Perfluorotetradecanoic acid (PFTeDA)                      | 376-06-7   | 0.625 µg/L               | 95.0             | 71.0                  | 132  |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4439369)                 |           |                                                                   |            |                          |                  |                       |      |
| EP2207812-003                                                        | Anonymous | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6   | 0.25 µg/L                | 128              | 67.0                  | 137  |
|                                                                      |           | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8 | 0.625 µg/L               | 124              | 68.0                  | 141  |
|                                                                      |           | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2  | 0.625 µg/L               | 112              | 62.6                  | 147  |
|                                                                      |           | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7 | 0.625 µg/L               | 133              | 66.0                  | 145  |
|                                                                      |           | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2  | 0.625 µg/L               | 124              | 57.6                  | 145  |
|                                                                      |           | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9  | 0.25 µg/L                | 129              | 65.0                  | 136  |
|                                                                      |           | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6  | 0.25 µg/L                | 114              | 61.0                  | 135  |
| EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4440297)                 |           |                                                                   |            |                          |                  |                       |      |
| ES2222761-001                                                        | Anonymous | EP231X: Perfluorooctane sulfonamide (FOSA)                        | 754-91-6   | 0.25 µg/L                | 109              | 67.0                  | 137  |
|                                                                      |           | EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)             | 31506-32-8 | 0.625 µg/L               | 101              | 68.0                  | 141  |
|                                                                      |           | EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)              | 4151-50-2  | 0.625 µg/L               | 102              | 62.6                  | 147  |



Sub-Matrix: **WATER**

| 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: 4440297) - continued |           |                                                                   |             |                          |                  |                       |      |
| ES2222761-001                                                    | Anonymous | EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)      | 24448-09-7  | 0.625 µg/L               | 93.0             | 66.0                  | 145  |
|                                                                  |           | EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)       | 1691-99-2   | 0.625 µg/L               | 110              | 57.6                  | 145  |
|                                                                  |           | EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | 2355-31-9   | 0.25 µg/L                | 109              | 65.0                  | 136  |
|                                                                  |           | EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)  | 2991-50-6   | 0.25 µg/L                | 110              | 61.0                  | 135  |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4439369)      |           |                                                                   |             |                          |                  |                       |      |
| EP2207812-003                                                    | Anonymous | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.25 µg/L                | 129              | 63.0                  | 143  |
|                                                                  |           | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 27619-97-2  | 0.25 µg/L                | 129              | 64.0                  | 140  |
|                                                                  |           | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | 39108-34-4  | 0.25 µg/L                | 122              | 67.0                  | 138  |
|                                                                  |           | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | 120226-60-0 | 0.25 µg/L                | 111              | 71.4                  | 144  |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4440297)      |           |                                                                   |             |                          |                  |                       |      |
| ES2222761-001                                                    | Anonymous | EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 757124-72-4 | 0.25 µg/L                | 109              | 63.0                  | 143  |
|                                                                  |           | EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 27619-97-2  | 0.25 µg/L                | 118              | 64.0                  | 140  |
|                                                                  |           | EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | 39108-34-4  | 0.25 µg/L                | 119              | 67.0                  | 138  |
|                                                                  |           | EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | 120226-60-0 | 0.25 µg/L                | 109              | 71.4                  | 144  |



## QA/QC Compliance Assessment to assist with Quality Review

Work Order : EP2207816

Page : 1 of 6

Client : STANTEC AUSTRALIA PTY LTD  
Contact :   
Project : WA\_0960\_PFASOMP  
Site : Learmonth SW/OTH -   
Sampler :   
Order number : pfas-omp Learmonth

Laboratory : Environmental Division Perth  
Telephone : +6138549 9609  
Date Samples Received : 27-Jun-2022  
Issue Date : 08-Jul-2022  
No. of samples received : 10  
No. of samples analysed : 10

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

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

### Summary of Outliers

#### Outliers : Quality Control Samples

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

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

#### Outliers : Analysis Holding Time Compliance

- Analysis Holding Time Outliers exist - please see following pages for full details.

#### Outliers : Frequency of Quality Control Samples

- **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                                                                               |
|-------------------------------------------------|----------------------|--------------------|--------------------------------|------------|----------------|--------|---------------------------------------------------------------------------------------|
| <b>Matrix Spike (MS) Recoveries</b>             |                      |                    |                                |            |                |        |                                                                                       |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA | EP2207739--003       | Anonymous          | Sulfate as SO4 - Turbidimetric | 14808-79-8 | Not Determined | ----   | MS recovery not determined, background level greater than or equal to 4x spike level. |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA | EP2207816--007       | 0960_OTH103_220623 | Sulfate as SO4 - Turbidimetric | 14808-79-8 | Not Determined | ----   | MS recovery not determined, background level greater than or equal to 4x spike level. |
| ED045G: Chloride by Discrete Analyser           | EP2207739--003       | Anonymous          | Chloride                       | 16887-00-6 | Not Determined | ----   | MS recovery not determined, background level greater than or equal to 4x spike level. |
| ED045G: Chloride by Discrete Analyser           | EP2207816--007       | 0960_OTH103_220623 | Chloride                       | 16887-00-6 | Not Determined | ----   | MS recovery not determined, background level greater than or equal to 4x spike level. |

### Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

| Method                                   |                     | Extraction / Preparation |                    |              | Analysis      |                  |              |
|------------------------------------------|---------------------|--------------------------|--------------------|--------------|---------------|------------------|--------------|
| Container / Client Sample ID(s)          |                     | Date extracted           | Due for extraction | Days overdue | Date analysed | Due for analysis | Days overdue |
| <b>ED037P: Alkalinity by PC Titrator</b> |                     |                          |                    |              |               |                  |              |
| <b>Clear Plastic Bottle - Natural</b>    |                     |                          |                    |              |               |                  |              |
| 0960_SW211_220623,                       | 0960_SW300_220623,  | ----                     | ----               | ----         | 08-Jul-2022   | 07-Jul-2022      | 1            |
| 0960_SW001_220623,                       | 0960_SW303_220623,  |                          |                    |              |               |                  |              |
| 0960_SW304_220623,                       | 0960_SW305_220623,  |                          |                    |              |               |                  |              |
| 0960_OTH103_220623,                      | 0960_OTH129_220623, |                          |                    |              |               |                  |              |
| 0960_SW192_220623,                       | 0960_SW193_220623   |                          |                    |              |               |                  |              |
| <b>ED093F: Dissolved Major Cations</b>   |                     |                          |                    |              |               |                  |              |
| <b>Clear Plastic Bottle - Natural</b>    |                     |                          |                    |              |               |                  |              |
| 0960_SW192_220623,                       | 0960_SW193_220623   | ----                     | ----               | ----         | 01-Jul-2022   | 30-Jun-2022      | 1            |

### 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.



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                                                                                      |                                                                                                            | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |
|-------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|
| Container / Client Sample ID(s)                                                                             |                                                                                                            |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| ED037P: Alkalinity by PC Titrator                                                                           |                                                                                                            |             |                          |                    |            |               |                  |            |
| Clear Plastic Bottle - Natural (ED037-P)                                                                    |                                                                                                            |             |                          |                    |            |               |                  |            |
| 0960_SW211_220623,<br>0960_SW001_220623,<br>0960_SW304_220623,<br>0960_OTH103_220623,<br>0960_SW192_220623, | 0960_SW300_220623,<br>0960_SW303_220623,<br>0960_SW305_220623,<br>0960_OTH129_220623,<br>0960_SW193_220623 | 23-Jun-2022 | ----                     | ----               | ----       | 08-Jul-2022   | 07-Jul-2022      | ✖          |
| ED041G: Sulfate (Turbidimetric) as SO4 2- by DA                                                             |                                                                                                            |             |                          |                    |            |               |                  |            |
| Clear Plastic Bottle - Natural (ED041G)                                                                     |                                                                                                            |             |                          |                    |            |               |                  |            |
| 0960_OTH103_220623,                                                                                         | 0960_OTH129_220623                                                                                         | 23-Jun-2022 | ----                     | ----               | ----       | 04-Jul-2022   | 21-Jul-2022      | ✔          |
| Clear Plastic Bottle - Natural (ED041G)                                                                     |                                                                                                            |             |                          |                    |            |               |                  |            |
| 0960_SW211_220623,<br>0960_SW001_220623,<br>0960_SW304_220623,<br>0960_SW192_220623,                        | 0960_SW300_220623,<br>0960_SW303_220623,<br>0960_SW305_220623,<br>0960_SW193_220623                        | 23-Jun-2022 | ----                     | ----               | ----       | 06-Jul-2022   | 21-Jul-2022      | ✔          |
| ED045G: Chloride by Discrete Analyser                                                                       |                                                                                                            |             |                          |                    |            |               |                  |            |
| Clear Plastic Bottle - Natural (ED045G)                                                                     |                                                                                                            |             |                          |                    |            |               |                  |            |
| 0960_OTH103_220623,                                                                                         | 0960_OTH129_220623                                                                                         | 23-Jun-2022 | ----                     | ----               | ----       | 04-Jul-2022   | 21-Jul-2022      | ✔          |
| Clear Plastic Bottle - Natural (ED045G)                                                                     |                                                                                                            |             |                          |                    |            |               |                  |            |
| 0960_SW211_220623,<br>0960_SW001_220623,<br>0960_SW304_220623,<br>0960_SW192_220623,                        | 0960_SW300_220623,<br>0960_SW303_220623,<br>0960_SW305_220623,<br>0960_SW193_220623                        | 23-Jun-2022 | ----                     | ----               | ----       | 06-Jul-2022   | 21-Jul-2022      | ✔          |
| ED093F: Dissolved Major Cations                                                                             |                                                                                                            |             |                          |                    |            |               |                  |            |
| Clear Plastic Bottle - Natural (ED093F)                                                                     |                                                                                                            |             |                          |                    |            |               |                  |            |
| 0960_SW211_220623,<br>0960_SW001_220623,<br>0960_SW304_220623,<br>0960_OTH103_220623,                       | 0960_SW300_220623,<br>0960_SW303_220623,<br>0960_SW305_220623,<br>0960_OTH129_220623                       | 23-Jun-2022 | ----                     | ----               | ----       | 28-Jun-2022   | 30-Jun-2022      | ✔          |
| Clear Plastic Bottle - Natural (ED093F)                                                                     |                                                                                                            |             |                          |                    |            |               |                  |            |
| 0960_SW192_220623,                                                                                          | 0960_SW193_220623                                                                                          | 23-Jun-2022 | ----                     | ----               | ----       | 01-Jul-2022   | 30-Jun-2022      | ✖          |
| EP231A: Perfluoroalkyl Sulfonic Acids                                                                       |                                                                                                            |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)                                                                                     |                                                                                                            |             |                          |                    |            |               |                  |            |
| 0960_SW211_220623,<br>0960_SW001_220623,<br>0960_SW304_220623,                                              | 0960_SW300_220623,<br>0960_SW303_220623,<br>0960_SW305_220623                                              | 23-Jun-2022 | 05-Jul-2022              | 20-Dec-2022        | ✔          | 06-Jul-2022   | 20-Dec-2022      | ✔          |
| HDPE (no PTFE) (EP231X)                                                                                     |                                                                                                            |             |                          |                    |            |               |                  |            |
| 0960_OTH103_220623,<br>0960_SW192_220623,                                                                   | 0960_OTH129_220623,<br>0960_SW193_220623                                                                   | 23-Jun-2022 | 06-Jul-2022              | 20-Dec-2022        | ✔          | 07-Jul-2022   | 20-Dec-2022      | ✔          |



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

| Method                                                                                    |                                                               | Sample Date | Extraction / Preparation |                    |            | Analysis      |                  |            |
|-------------------------------------------------------------------------------------------|---------------------------------------------------------------|-------------|--------------------------|--------------------|------------|---------------|------------------|------------|
| Container / Client Sample ID(s)                                                           |                                                               |             | Date extracted           | Due for extraction | Evaluation | Date analysed | Due for analysis | Evaluation |
| EP231B: Perfluoroalkyl Carboxylic Acids                                                   |                                                               |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)<br>0960_SW211_220623,<br>0960_SW001_220623,<br>0960_SW304_220623, | 0960_SW300_220623,<br>0960_SW303_220623,<br>0960_SW305_220623 | 23-Jun-2022 | 05-Jul-2022              | 20-Dec-2022        | ✔          | 06-Jul-2022   | 20-Dec-2022      | ✔          |
| HDPE (no PTFE) (EP231X)<br>0960_OTH103_220623,<br>0960_SW192_220623,                      | 0960_OTH129_220623,<br>0960_SW193_220623                      | 23-Jun-2022 | 06-Jul-2022              | 20-Dec-2022        | ✔          | 07-Jul-2022   | 20-Dec-2022      | ✔          |
| EP231C: Perfluoroalkyl Sulfonamides                                                       |                                                               |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)<br>0960_SW211_220623,<br>0960_SW001_220623,<br>0960_SW304_220623, | 0960_SW300_220623,<br>0960_SW303_220623,<br>0960_SW305_220623 | 23-Jun-2022 | 05-Jul-2022              | 20-Dec-2022        | ✔          | 06-Jul-2022   | 20-Dec-2022      | ✔          |
| HDPE (no PTFE) (EP231X)<br>0960_OTH103_220623,<br>0960_SW192_220623,                      | 0960_OTH129_220623,<br>0960_SW193_220623                      | 23-Jun-2022 | 06-Jul-2022              | 20-Dec-2022        | ✔          | 07-Jul-2022   | 20-Dec-2022      | ✔          |
| EP231D: (n:2) Fluorotelomer Sulfonic Acids                                                |                                                               |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)<br>0960_SW211_220623,<br>0960_SW001_220623,<br>0960_SW304_220623, | 0960_SW300_220623,<br>0960_SW303_220623,<br>0960_SW305_220623 | 23-Jun-2022 | 05-Jul-2022              | 20-Dec-2022        | ✔          | 06-Jul-2022   | 20-Dec-2022      | ✔          |
| HDPE (no PTFE) (EP231X)<br>0960_OTH103_220623,<br>0960_SW192_220623,                      | 0960_OTH129_220623,<br>0960_SW193_220623                      | 23-Jun-2022 | 06-Jul-2022              | 20-Dec-2022        | ✔          | 07-Jul-2022   | 20-Dec-2022      | ✔          |
| EP231P: PFAS Sums                                                                         |                                                               |             |                          |                    |            |               |                  |            |
| HDPE (no PTFE) (EP231X)<br>0960_SW211_220623,<br>0960_SW001_220623,<br>0960_SW304_220623, | 0960_SW300_220623,<br>0960_SW303_220623,<br>0960_SW305_220623 | 23-Jun-2022 | 05-Jul-2022              | 20-Dec-2022        | ✔          | 06-Jul-2022   | 20-Dec-2022      | ✔          |
| HDPE (no PTFE) (EP231X)<br>0960_OTH103_220623,<br>0960_SW192_220623,                      | 0960_OTH129_220623,<br>0960_SW193_220623                      | 23-Jun-2022 | 06-Jul-2022              | 20-Dec-2022        | ✔          | 07-Jul-2022   | 20-Dec-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                            |         | Count |         | Rate (%) |          |            | Quality Control Specification  |
|--------------------------------------------------------|---------|-------|---------|----------|----------|------------|--------------------------------|
| Analytical Methods                                     | Method  | QC    | Regular | Actual   | Expected | Evaluation |                                |
|                                                        |         |       |         |          |          |            |                                |
| Laboratory Duplicates (DUP)                            |         |       |         |          |          |            |                                |
| Alkalinity by Auto Titrator                            | ED037-P | 1     | 10      | 10.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 6     | 57      | 10.53    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 6     | 52      | 11.54    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 4     | 38      | 10.53    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 6     | 51      | 11.76    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Laboratory Control Samples (LCS)                       |         |       |         |          |          |            |                                |
| Alkalinity by Auto Titrator                            | ED037-P | 2     | 10      | 20.00    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 6     | 57      | 10.53    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 3     | 52      | 5.77     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 2     | 38      | 5.26     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 6     | 51      | 11.76    | 10.00    | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Method Blanks (MB)                                     |         |       |         |          |          |            |                                |
| Alkalinity by Auto Titrator                            | ED037-P | 1     | 10      | 10.00    | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Chloride by Discrete Analyser                          | ED045G  | 3     | 57      | 5.26     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Major Cations - Dissolved                              | ED093F  | 3     | 52      | 5.77     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 2     | 38      | 5.26     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 3     | 51      | 5.88     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Matrix Spikes (MS)                                     |         |       |         |          |          |            |                                |
| Chloride by Discrete Analyser                          | ED045G  | 3     | 57      | 5.26     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS   | EP231X  | 2     | 38      | 5.26     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |
| Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser | ED041G  | 3     | 51      | 5.88     | 5.00     | ✓          | NEPM 2013 B3 & ALS QC Standard |



## Brief Method Summaries

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

| Analytical Methods                                                 | Method       | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------------------|--------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alkalinity by Auto Titrator                                        | ED037-P      | WATER  | In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                                                                                                                                                                                                                |
| Sulfate (Turbidimetric) as SO <sub>4</sub> 2- by Discrete Analyser | ED041G       | WATER  | In house: Referenced to APHA 4500-SO <sub>4</sub> . Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO <sub>4</sub> suspension is measured by a photometer and the SO <sub>4</sub> -2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                         |
| Chloride by Discrete Analyser                                      | ED045G       | WATER  | In house: Referenced to APHA 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm.                                                                                                                                                                                                                                                                                                                                                                |
| Major Cations - Dissolved                                          | ED093F       | WATER  | In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                           |
| Ionic Balance by PCT DA and Turbi SO <sub>4</sub> DA               | * EN055 - PG | WATER  | In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS               | EP231X       | WATER  | In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements. |
| Preparation Methods                                                | Method       | Matrix | Method Descriptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Solid Phase Extraction (SPE) for PFAS in water                     | ORG72        | WATER  | In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.                                                                                                                                                                                                |







**Eurofins ARL Pty Ltd**

ABN: 91 05 0159 898

Perth  
46-48 Banksia Road  
Welshpool WA 6106  
Phone : +61 8 6253 4444  
NATA # 2377 Site # 2370

**Eurofins Environment Testing Australia Pty Ltd**

ABN: 50 005 085 521

Melbourne  
6 Monterey Road  
Dandenong South VIC 3175  
Phone : +61 3 8564 5000  
NATA # 1261 Site # 1254

Sydney  
179 Magowar Road  
Girraween NSW 2145  
Phone : +61 2 9900 8400  
NATA # 1261 Site # 18217

Brisbane  
1/21 Smallwood Place  
Murarrie QLD 4172  
Phone : +61 7 3902 4600  
NATA # 1261 Site # 20794

Newcastle  
4/52 Industrial Drive  
Mayfield East NSW 2304  
PO Box 60 Wickham 2293  
Phone : +61 2 4968 8448  
NATA # 1261 Site # 25079

**Eurofins Environment Testing NZ Limited**

NZBN: 9429046024954

Auckland  
35 O'Rorke Road  
Penrose, Auckland 1061  
Phone : +64 9 526 45 51  
IANZ # 1327

Christchurch  
43 Detroit Drive  
Rolleston, Christchurch 7675  
Phone : 0800 856 450  
IANZ # 1290

## Sample Receipt Advice

**Company name:** Stantec Australia Pty Ltd (WA)  
**Contact name:** [REDACTED]  
**Project name:** Not provided  
**Project ID:** Not provided  
**Turnaround time:** 7 Day  
**Date/Time received:** Jun 28, 2022 11:38 AM  
**Eurofins reference:** 901145

## 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

Missing sample 0960\_QC228\_220623 and sample 096\_QC227\_220623 is a soil and not water. Please advise.

## Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

[REDACTED] on phone : or by email: [REDACTED]

Results will be delivered electronically via email to [REDACTED] - [REDACTED]@stantec.com.

Note: A copy of these results will also be delivered to the general Stantec Australia Pty Ltd (WA) email address.



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IANZ # 1290

web: www.eurofins.com.au

email: EnviroSales@eurofins.com

**Company Name:** Stantec Australia Pty Ltd (WA)  
**Address:** 6F 226, Adelaide Terrace  
Perth  
WA 6000

**Order No.:** PFAS-OMP 304700525  
**Report #:** 901145  
**Phone:** 0458 839 200  
**Fax:**

**Received:** Jun 28, 2022 11:38 AM  
**Due:** Jul 7, 2022  
**Priority:** 7 Day  
**Contact Name:** [REDACTED]

**Project Name:****Eurofins Analytical Services Manager :** [REDACTED]

| Sample Detail                                  |                   |              |               |            |               | Moisture Set | PFAS (Full Suite) Water Low | PFAS (Full Suite) Soil |
|------------------------------------------------|-------------------|--------------|---------------|------------|---------------|--------------|-----------------------------|------------------------|
| Perth Laboratory - NATA # 2377 Site # 2370     |                   |              |               |            |               | X            | X                           | X                      |
| Melbourne Laboratory - NATA # 1261 Site # 1254 |                   |              |               |            |               |              |                             |                        |
| Sydney Laboratory - NATA # 1261 Site # 18217   |                   |              |               |            |               |              |                             |                        |
| Brisbane Laboratory - NATA # 1261 Site # 20794 |                   |              |               |            |               |              |                             |                        |
| Mayfield Laboratory - NATA # 1261 Site # 25079 |                   |              |               |            |               |              |                             |                        |
| External Laboratory                            |                   |              |               |            |               |              |                             |                        |
| No                                             | Sample ID         | Sample Date  | Sampling Time | Matrix     | LAB ID        |              |                             |                        |
| 1                                              | 0960_QC215_220622 | Jun 22, 2022 |               | TOP - Soil | L22-Jn0061603 | X            |                             | X                      |
| 2                                              | 0960_QC216_220622 | Jun 22, 2022 |               | Water      | L22-Jn0061604 |              | X                           |                        |
| 3                                              | 0960_QC217_220622 | Jun 22, 2022 |               | Water      | L22-Jn0061605 |              | X                           |                        |
| 4                                              | 0960_QC218_220622 | Jun 22, 2022 |               | Soil       | L22-Jn0061606 | X            |                             | X                      |
| 5                                              | 0960_QC219_220622 | Jun 22, 2022 |               | Water      | L22-Jn0061607 |              | X                           |                        |
| 6                                              | 0960_QC220_220622 | Jun 22, 2022 |               | Water      | L22-Jn0061608 |              | X                           |                        |



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**Company Name:** Stantec Australia Pty Ltd (WA)  
**Address:** 6F 226, Adelaide Terrace  
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**Order No.:** PFAS-OMP 304700525  
**Report #:** 901145  
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**Received:** Jun 28, 2022 11:38 AM  
**Due:** Jul 7, 2022  
**Priority:** 7 Day  
**Contact Name:** [REDACTED]

**Project Name:****Eurofins Analytical Services Manager :** [REDACTED]

| Sample Detail                                  |                   |              |  |       |               | Moisture Set | PFAS (Full Suite) Water Low | PFAS (Full Suite) Soil |
|------------------------------------------------|-------------------|--------------|--|-------|---------------|--------------|-----------------------------|------------------------|
| Perth Laboratory - NATA # 2377 Site # 2370     |                   |              |  |       |               | X            | X                           | X                      |
| Melbourne Laboratory - NATA # 1261 Site # 1254 |                   |              |  |       |               |              |                             |                        |
| Sydney Laboratory - NATA # 1261 Site # 18217   |                   |              |  |       |               |              |                             |                        |
| Brisbane Laboratory - NATA # 1261 Site # 20794 |                   |              |  |       |               |              |                             |                        |
| Mayfield Laboratory - NATA # 1261 Site # 25079 |                   |              |  |       |               |              |                             |                        |
| External Laboratory                            |                   |              |  |       |               |              |                             |                        |
| 7                                              | 0960_QC221_220622 | Jun 22, 2022 |  | Water | L22-Jn0061609 |              | X                           |                        |
| 8                                              | 0960_QC222_220622 | Jun 22, 2022 |  | Soil  | L22-Jn0061610 | X            |                             | X                      |
| 9                                              | 0960_QC223_220622 | Jun 22, 2022 |  | Soil  | L22-Jn0061611 | X            |                             | X                      |
| 10                                             | 0960_QC224_220622 | Jun 22, 2022 |  | Water | L22-Jn0061612 |              | X                           |                        |
| 11                                             | 0960_QC225_220622 | Jun 22, 2022 |  | Soil  | L22-Jn0061613 | X            |                             | X                      |
| 12                                             | 0960_QC226_220623 | Jun 23, 2022 |  | Water | L22-Jn0061614 |              | X                           |                        |
| 13                                             | 0960_QC227_220623 | Jun 23, 2022 |  | Water | L22-Jn0061615 |              | X                           |                        |



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**Company Name:** Stantec Australia Pty Ltd (WA)  
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**Order No.:** PFAS-OMP 304700525  
**Report #:** 901145  
**Phone:** 0458 839 200  
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**Received:** Jun 28, 2022 11:38 AM  
**Due:** Jul 7, 2022  
**Priority:** 7 Day  
**Contact Name:** [REDACTED]

**Project Name:****Eurofins Analytical Services Manager :** [REDACTED]

Sample Detail

| Moisture Set | PFAS (Full Suite) Water Low | PFAS (Full Suite) Soil |
|--------------|-----------------------------|------------------------|
| X            | X                           | X                      |
|              |                             |                        |
|              |                             |                        |
|              |                             |                        |
|              |                             |                        |
|              |                             |                        |
| 5            | 8                           | 5                      |

Perth Laboratory - NATA # 2377 Site # 2370

Melbourne Laboratory - NATA # 1261 Site # 1254

Sydney Laboratory - NATA # 1261 Site # 18217

Brisbane Laboratory - NATA # 1261 Site # 20794

Mayfield Laboratory - NATA # 1261 Site # 25079

External Laboratory

Test Counts

Stantec Australia Pty Limited  
6F 226, Adelaide Terrace  
Perth  
WA 6000



NATA Accredited  
Accreditation Number 2377  
Site Number 2370

Accredited for compliance with ISO/IEC 17025 – Testing  
NATA is a signatory to the ILAC Mutual Recognition  
Arrangement for the mutual recognition of the  
equivalence of testing, medical testing, calibration,  
inspection, proficiency testing scheme providers and  
reference materials producers reports and certificates.

Attention:



**Report** 901145-S  
Project name WA\_0960\_PFASOMP  
Project ID WA\_0960\_PFASOMP  
Received Date Jun 28, 2022

| Client Sample ID                                           |        |       | 0960_QC218_2<br>20622 | 0960_QC222_2<br>20622 | 0960_QC223_2<br>20622 | 0960_QC225_2<br>20622 |
|------------------------------------------------------------|--------|-------|-----------------------|-----------------------|-----------------------|-----------------------|
| Sample Matrix                                              |        |       | Soil                  | Soil                  | Soil                  | Soil                  |
| Eurofins Sample No.                                        |        |       | L22-Jn0061606         | L22-Jn0061610         | L22-Jn0061611         | L22-Jn0061613         |
| Date Sampled                                               |        |       | Jun 22, 2022          | Jun 22, 2022          | Jun 22, 2022          | Jun 22, 2022          |
| Test/Reference                                             | LOR    | Unit  |                       |                       |                       |                       |
| % Moisture                                                 | 1      | %     | 13                    | 15                    | 20                    | 23                    |
| <b>PFAS (Full Suite) Soil</b>                              |        |       |                       |                       |                       |                       |
| Perfluorobutanoic acid (PFBA)                              | 0.0008 | mg/kg | < 0.0008              | < 0.0008              | < 0.0008              | < 0.0008              |
| Perfluoropentanoic acid (PFPeA)                            | 0.0002 | mg/kg | < 0.0002              | < 0.0002              | < 0.0002              | < 0.0002              |
| Perfluorohexanoic acid (PFHxA)                             | 0.0004 | mg/kg | < 0.0004              | < 0.0004              | < 0.0004              | < 0.0004              |
| Perfluoroheptanoic acid (PFHpA)                            | 0.0008 | mg/kg | < 0.0008              | < 0.0008              | < 0.0008              | < 0.0008              |
| Perfluorooctanoic acid (PFOA)                              | 0.0002 | mg/kg | < 0.0002              | < 0.0002              | < 0.0002              | < 0.0002              |
| Perfluorononanoic acid (PFNA)                              | 0.0002 | mg/kg | < 0.0002              | < 0.0002              | < 0.0002              | < 0.0002              |
| Perfluorodecanoic acid (PFDA)                              | 0.0002 | mg/kg | < 0.0002              | < 0.0002              | < 0.0002              | < 0.0002              |
| Perfluoroundecanoic acid (PFUnDA)                          | 0.0002 | mg/kg | < 0.0002              | < 0.0002              | < 0.0002              | < 0.0002              |
| Perfluorododecanoic acid (PFDoDA)                          | 0.0002 | mg/kg | < 0.0002              | < 0.0002              | < 0.0002              | < 0.0002              |
| Perfluorotridecanoic acid (PFTTrDA)                        | 0.0002 | mg/kg | < 0.0002              | < 0.0002              | < 0.0002              | < 0.0002              |
| Perfluorotetradecanoic acid (PFTeDA)                       | 0.0002 | mg/kg | < 0.0002              | < 0.0002              | < 0.0002              | < 0.0002              |
| Perfluorobutane sulfonic acid (PFBS)                       | 0.0004 | mg/kg | < 0.0004              | < 0.0004              | < 0.0004              | < 0.0004              |
| Perfluoropentane sulfonic acid (PFPeS)                     | 0.0004 | mg/kg | < 0.0004              | < 0.0004              | < 0.0004              | < 0.0004              |
| Perfluorohexane sulfonic acid (PFHxS)                      | 0.0004 | mg/kg | < 0.0004              | < 0.0004              | 0.0013                | < 0.0004              |
| Perfluoroheptane sulfonic acid (PFHpS)                     | 0.0004 | mg/kg | < 0.0004              | < 0.0004              | < 0.0004              | < 0.0004              |
| Perfluorooctane sulfonic acid (PFOS)                       | 0.0004 | mg/kg | 0.029                 | 0.0027                | 0.0099                | < 0.0004              |
| Perfluorodecane sulfonic acid (PFDS)                       | 0.0004 | mg/kg | < 0.0004              | < 0.0004              | < 0.0004              | < 0.0004              |
| 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                  | 0.0005 | mg/kg | < 0.0005              | < 0.0005              | < 0.0005              | < 0.0005              |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                  | 0.0005 | mg/kg | < 0.0005              | < 0.0005              | < 0.0005              | < 0.0005              |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                  | 0.0005 | mg/kg | < 0.0005              | < 0.0005              | < 0.0005              | < 0.0005              |
| 10:2 Fluorotelomer sulfonic acid (10:2 FTS)                | 0.0005 | mg/kg | < 0.0005              | < 0.0005              | < 0.0005              | < 0.0005              |
| Perfluorooctane sulfonamide (FOSA)                         | 0.0004 | mg/kg | < 0.0004              | < 0.0004              | < 0.0004              | < 0.0004              |
| N-Methyl perfluorooctane sulfonamide (Me-FOSA)             | 0.0004 | mg/kg | < 0.0004              | < 0.0004              | < 0.0004              | < 0.0004              |
| N-Ethyl perfluorooctane sulfonamide (Et-FOSA)              | 0.0004 | mg/kg | < 0.0004              | < 0.0004              | < 0.0004              | < 0.0004              |
| Perfluorooctane sulfonamidoacetic acid (FOSAA)             | 0.0004 | mg/kg | < 0.0004              | < 0.0004              | < 0.0004              | < 0.0004              |
| N-Methyl perfluorooctane sulfonamidoacetic acid (Me-FOSAA) | 0.0004 | mg/kg | < 0.0004              | < 0.0004              | < 0.0004              | < 0.0004              |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (Et-FOSAA)  | 0.0004 | mg/kg | < 0.0004              | < 0.0004              | < 0.0004              | < 0.0004              |
| N-Methyl perfluorooctane sulfonamidoethanol (N-Me-FOSE)    | 0.0008 | mg/kg | < 0.0008              | < 0.0008              | < 0.0008              | < 0.0008              |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-Et-FOSE)     | 0.0008 | mg/kg | < 0.0008              | < 0.0008              | < 0.0008              | < 0.0008              |
| Sum of PFAS                                                | 0.0002 | mg/kg | 0.029                 | 0.0027                | 0.011                 | < 0.0002              |

|                               |        |       |                               |                               |                               |                               |
|-------------------------------|--------|-------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| <b>Client Sample ID</b>       |        |       | <b>0960_QC218_2<br/>20622</b> | <b>0960_QC222_2<br/>20622</b> | <b>0960_QC223_2<br/>20622</b> | <b>0960_QC225_2<br/>20622</b> |
| <b>Sample Matrix</b>          |        |       | <b>Soil</b>                   | <b>Soil</b>                   | <b>Soil</b>                   | <b>Soil</b>                   |
| <b>Eurofins Sample No.</b>    |        |       | <b>L22-Jn0061606</b>          | <b>L22-Jn0061610</b>          | <b>L22-Jn0061611</b>          | <b>L22-Jn0061613</b>          |
| <b>Date Sampled</b>           |        |       | <b>Jun 22, 2022</b>           | <b>Jun 22, 2022</b>           | <b>Jun 22, 2022</b>           | <b>Jun 22, 2022</b>           |
| Test/Reference                | LOR    | Unit  |                               |                               |                               |                               |
| <b>PFAS (Full Suite) Soil</b> |        |       |                               |                               |                               |                               |
| Sum of PFHxS and PFOS         | 0.0004 | mg/kg | 0.029                         | 0.0027                        | 0.011                         | < 0.0004                      |
| Sum of PFAS (WA DER List)     | 0.0002 | mg/kg | 0.029                         | 0.0027                        | 0.011                         | < 0.0002                      |

|                                                            |        |       |                               |
|------------------------------------------------------------|--------|-------|-------------------------------|
| <b>Client Sample ID</b>                                    |        |       | <b>0960_QC227_2<br/>20623</b> |
| <b>Sample Matrix</b>                                       |        |       | <b>Soil</b>                   |
| <b>Eurofins Sample No.</b>                                 |        |       | <b>L22-Jn0061615</b>          |
| <b>Date Sampled</b>                                        |        |       | <b>Jun 23, 2022</b>           |
| Test/Reference                                             | LOR    | Unit  |                               |
|                                                            |        |       |                               |
| % Moisture                                                 | 1      | %     | 28                            |
| <b>PFAS (Full Suite) Soil</b>                              |        |       |                               |
| Perfluorobutanoic acid (PFBA)                              | 0.0008 | mg/kg | < 0.0008                      |
| Perfluoropentanoic acid (PFPeA)                            | 0.0002 | mg/kg | < 0.0002                      |
| Perfluorohexanoic acid (PFHxA)                             | 0.0004 | mg/kg | < 0.0004                      |
| Perfluoroheptanoic acid (PFHpA)                            | 0.0008 | mg/kg | < 0.0008                      |
| Perfluorooctanoic acid (PFOA)                              | 0.0002 | mg/kg | < 0.0002                      |
| Perfluorononanoic acid (PFNA)                              | 0.0002 | mg/kg | < 0.0002                      |
| Perfluorodecanoic acid (PFDA)                              | 0.0002 | mg/kg | < 0.0002                      |
| Perfluoroundecanoic acid (PFUnDA)                          | 0.0002 | mg/kg | < 0.0002                      |
| Perfluorododecanoic acid (PFDoDA)                          | 0.0002 | mg/kg | < 0.0002                      |
| Perfluorotridecanoic acid (PFTTrDA)                        | 0.0002 | mg/kg | < 0.0002                      |
| Perfluorotetradecanoic acid (PFTeDA)                       | 0.0002 | mg/kg | < 0.0002                      |
| Perfluorobutane sulfonic acid (PFBS)                       | 0.0004 | mg/kg | < 0.0004                      |
| Perfluoropentane sulfonic acid (PFPeS)                     | 0.0004 | mg/kg | < 0.0004                      |
| Perfluorohexane sulfonic acid (PFHxS)                      | 0.0004 | mg/kg | < 0.0004                      |
| Perfluoroheptane sulfonic acid (PFHpS)                     | 0.0004 | mg/kg | < 0.0004                      |
| Perfluorooctane sulfonic acid (PFOS)                       | 0.0004 | mg/kg | < 0.0004                      |
| Perfluorodecane sulfonic acid (PFDS)                       | 0.0004 | mg/kg | < 0.0004                      |
| 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                  | 0.0005 | mg/kg | < 0.0005                      |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                  | 0.0005 | mg/kg | < 0.0005                      |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                  | 0.0005 | mg/kg | < 0.0005                      |
| 10:2 Fluorotelomer sulfonic acid (10:2 FTS)                | 0.0005 | mg/kg | < 0.0005                      |
| Perfluorooctane sulfonamide (FOSA)                         | 0.0004 | mg/kg | < 0.0004                      |
| N-Methyl perfluorooctane sulfonamide (Me-FOSA)             | 0.0004 | mg/kg | < 0.0004                      |
| N-Ethyl perfluorooctane sulfonamide (Et-FOSA)              | 0.0004 | mg/kg | < 0.0004                      |
| Perfluorooctane sulfonamidoacetic acid (FOSAA)             | 0.0004 | mg/kg | < 0.0004                      |
| N-Methyl perfluorooctane sulfonamidoacetic acid (Me-FOSAA) | 0.0004 | mg/kg | < 0.0004                      |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (Et-FOSAA)  | 0.0004 | mg/kg | < 0.0004                      |
| N-Methyl perfluorooctane sulfonamidoethanol (N-Me-FOSE)    | 0.0008 | mg/kg | < 0.0008                      |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-Et-FOSE)     | 0.0008 | mg/kg | < 0.0008                      |
| Sum of PFAS                                                | 0.0002 | mg/kg | < 0.0002                      |
| Sum of PFHxS and PFOS                                      | 0.0004 | mg/kg | < 0.0004                      |
| Sum of PFAS (WA DER List)                                  | 0.0002 | mg/kg | < 0.0002                      |

### 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<br>- Method: ARL135 Moisture in Solids                                                        | Welshpool    | Jun 28, 2022 | 14 Days      |
| PFAS (Full Suite) Soil<br>- Method: ARL511 - Per and Polyfluoroalkyl Substances in Soil/Sediment by LCMS | Welshpool    | Jun 28, 2022 | 28 Days      |



**Company Name:** Stantec Australia Pty Ltd (WA)  
**Address:** 6F 226,Adelaide Terrace  
Perth  
WA 6000

**Project Name:** WA\_0960\_PFASOMP  
**Project ID:** WA\_0960\_PFASOMP

**Order No.:** PFAS-OMP 304700525  
**Report #:** 901145  
**Phone:** 0458 839 200  
**Fax:**

**Received:** Jun 28, 2022 11:38 AM  
**Due:** Jul 7, 2022  
**Priority:** 7 Day  
**Contact Name:** [REDACTED]

**Eurofins Analytical Services Manager :** [REDACTED]

| Sample Detail                              |                   |              |               |        |               | Moisture Set | PFAS (Full Suite) Water Low | PFAS (Full Suite) Soil |
|--------------------------------------------|-------------------|--------------|---------------|--------|---------------|--------------|-----------------------------|------------------------|
| Perth Laboratory - NATA # 2377 Site # 2370 |                   |              |               |        |               | X            | X                           | X                      |
| External Laboratory                        |                   |              |               |        |               |              |                             |                        |
| No                                         | Sample ID         | Sample Date  | Sampling Time | Matrix | LAB ID        |              |                             |                        |
| 1                                          | 0960_QC215_220622 | Jun 22, 2022 |               | Water  | L22-Jn0061603 |              | X                           |                        |
| 2                                          | 0960_QC216_220622 | Jun 22, 2022 |               | Water  | L22-Jn0061604 |              | X                           |                        |
| 3                                          | 0960_QC217_220622 | Jun 22, 2022 |               | Water  | L22-Jn0061605 |              | X                           |                        |
| 4                                          | 0960_QC218_220622 | Jun 22, 2022 |               | Soil   | L22-Jn0061606 | X            |                             | X                      |
| 5                                          | 0960_QC219_220622 | Jun 22, 2022 |               | Water  | L22-Jn0061607 |              | X                           |                        |
| 6                                          | 0960_QC220_220622 | Jun 22, 2022 |               | Water  | L22-Jn0061608 |              | X                           |                        |
| 7                                          | 0960_QC221_220622 | Jun 22, 2022 |               | Water  | L22-Jn0061609 |              | X                           |                        |
| 8                                          | 0960_QC222_220622 | Jun 22, 2022 |               | Soil   | L22-Jn0061610 | X            |                             | X                      |



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**Address:** 6F 226, Adelaide Terrace  
Perth  
WA 6000

**Project Name:** WA\_0960\_PFASOMP  
**Project ID:** WA\_0960\_PFASOMP

**Order No.:** PFAS-OMP 304700525  
**Report #:** 901145  
**Phone:** 0458 839 200  
**Fax:**

**Received:** Jun 28, 2022 11:38 AM  
**Due:** Jul 7, 2022  
**Priority:** 7 Day  
**Contact Name:** [REDACTED]

**Eurofins Analytical Services Manager :** [REDACTED]

#### Sample Detail

Moisture Set

PFAS (Full Suite) Water Low

PFAS (Full Suite) Soil

#### Perth Laboratory - NATA # 2377 Site # 2370

|                    |                   |              |  |       |               | X | X | X |
|--------------------|-------------------|--------------|--|-------|---------------|---|---|---|
| 9                  | 0960_QC223_220622 | Jun 22, 2022 |  | Soil  | L22-Jn0061611 | X |   | X |
| 10                 | 0960_QC224_220622 | Jun 22, 2022 |  | Water | L22-Jn0061612 |   | X |   |
| 11                 | 0960_QC225_220622 | Jun 22, 2022 |  | Soil  | L22-Jn0061613 | X |   | X |
| 12                 | 0960_QC226_220623 | Jun 23, 2022 |  | Water | L22-Jn0061614 |   | X |   |
| 13                 | 0960_QC227_220623 | Jun 23, 2022 |  | Soil  | L22-Jn0061615 | X |   | X |
| <b>Test Counts</b> |                   |              |  |       |               | 5 | 8 | 5 |

## Internal Quality Control Review and Glossary

### General

1. 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.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. 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

|                                                  |                                           |                                                                          |
|--------------------------------------------------|-------------------------------------------|--------------------------------------------------------------------------|
| <b>mg/kg:</b> milligrams per kilogram            | <b>mg/L:</b> milligrams per litre         | <b>µg/L:</b> micrograms per litre                                        |
| <b>ppm:</b> parts per million                    | <b>ppb:</b> parts per billion             | <b>%:</b> Percentage                                                     |
| <b>org/100 mL:</b> Organisms per 100 millilitres | <b>NTU:</b> Nephelometric Turbidity Units | <b>MPN/100 mL:</b> Most Probable Number of organisms per 100 millilitres |

### Terms

|                         |                                                                                                                                                                                                                                                                                               |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>APHA</b>             | American Public Health Association                                                                                                                                                                                                                                                            |
| <b>COC</b>              | Chain of Custody                                                                                                                                                                                                                                                                              |
| <b>CP</b>               | Client Parent - QC was performed on samples pertaining to this report                                                                                                                                                                                                                         |
| <b>CRM</b>              | Certified Reference Material (ISO17034) - reported as percent recovery.                                                                                                                                                                                                                       |
| <b>Dry</b>              | Where a moisture has been determined on a solid sample the result is expressed on a dry basis.                                                                                                                                                                                                |
| <b>Duplicate</b>        | A second piece of analysis from the same sample and reported in the same units as the result to show comparison.                                                                                                                                                                              |
| <b>LOR</b>              | Limit of Reporting.                                                                                                                                                                                                                                                                           |
| <b>LCS</b>              | Laboratory Control Sample - reported as percent recovery.                                                                                                                                                                                                                                     |
| <b>Method Blank</b>     | 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.                                                                                                                                |
| <b>NCP</b>              | 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.                                                                                                                            |
| <b>RPD</b>              | Relative Percent Difference between two Duplicate pieces of analysis.                                                                                                                                                                                                                         |
| <b>SPIKE</b>            | Addition of the analyte to the sample and reported as percentage recovery.                                                                                                                                                                                                                    |
| <b>SRA</b>              | Sample Receipt Advice                                                                                                                                                                                                                                                                         |
| <b>Surr - Surrogate</b> | The addition of a like compound to the analyte target and reported as percentage recovery.                                                                                                                                                                                                    |
| <b>TBTO</b>             | 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. |
| <b>TCLP</b>             | Toxicity Characteristic Leaching Procedure                                                                                                                                                                                                                                                    |
| <b>TEQ</b>              | Toxic Equivalency Quotient or Total Equivalence                                                                                                                                                                                                                                               |
| <b>QSM</b>              | US Department of Defense Quality Systems Manual Version 5.4                                                                                                                                                                                                                                   |
| <b>US EPA</b>           | United States Environmental Protection Agency                                                                                                                                                                                                                                                 |
| <b>WA DWER</b>          | 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

1. 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.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

## Quality Control Results

| Test                                                       | Units | Result 1 |  |  | Acceptance Limits | Pass Limits | Qualifying Code |
|------------------------------------------------------------|-------|----------|--|--|-------------------|-------------|-----------------|
| <b>Method Blank</b>                                        |       |          |  |  |                   |             |                 |
| <b>PFAS (Full Suite) Soil</b>                              |       |          |  |  |                   |             |                 |
| Perfluorobutanoic acid (PFBA)                              | mg/kg | < 0.0008 |  |  | 0.0008            | Pass        |                 |
| Perfluoropentanoic acid (PFPeA)                            | mg/kg | < 0.0002 |  |  | 0.0002            | Pass        |                 |
| Perfluorohexanoic acid (PFHxA)                             | mg/kg | < 0.0004 |  |  | 0.0004            | Pass        |                 |
| Perfluoroheptanoic acid (PFHpA)                            | mg/kg | < 0.0008 |  |  | 0.0008            | Pass        |                 |
| Perfluorooctanoic acid (PFOA)                              | mg/kg | < 0.0002 |  |  | 0.0002            | Pass        |                 |
| Perfluorononanoic acid (PFNA)                              | mg/kg | < 0.0002 |  |  | 0.0002            | Pass        |                 |
| Perfluorodecanoic acid (PFDA)                              | mg/kg | < 0.0002 |  |  | 0.0002            | Pass        |                 |
| Perfluoroundecanoic acid (PFUnDA)                          | mg/kg | < 0.0002 |  |  | 0.0002            | Pass        |                 |
| Perfluorododecanoic acid (PFDoDA)                          | mg/kg | < 0.0002 |  |  | 0.0002            | Pass        |                 |
| Perfluorotridecanoic acid (PFTTrDA)                        | mg/kg | < 0.0002 |  |  | 0.0002            | Pass        |                 |
| Perfluorotetradecanoic acid (PFTeDA)                       | mg/kg | < 0.0002 |  |  | 0.0002            | Pass        |                 |
| Perfluorobutane sulfonic acid (PFBS)                       | mg/kg | < 0.0004 |  |  | 0.0004            | Pass        |                 |
| Perfluoropentane sulfonic acid (PFPeS)                     | mg/kg | < 0.0004 |  |  | 0.0004            | Pass        |                 |
| Perfluorohexane sulfonic acid (PFHxS)                      | mg/kg | < 0.0004 |  |  | 0.0004            | Pass        |                 |
| Perfluoroheptane sulfonic acid (PFHpS)                     | mg/kg | < 0.0004 |  |  | 0.0004            | Pass        |                 |
| Perfluorooctane sulfonic acid (PFOS)                       | mg/kg | < 0.0004 |  |  | 0.0004            | Pass        |                 |
| Perfluorodecane sulfonic acid (PFDS)                       | mg/kg | < 0.0004 |  |  | 0.0004            | Pass        |                 |
| 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                  | mg/kg | < 0.0005 |  |  | 0.0005            | Pass        |                 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                  | mg/kg | < 0.0005 |  |  | 0.0005            | Pass        |                 |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                  | mg/kg | < 0.0005 |  |  | 0.0005            | Pass        |                 |
| 10:2 Fluorotelomer sulfonic acid (10:2 FTS)                | mg/kg | < 0.0005 |  |  | 0.0005            | Pass        |                 |
| Perfluorooctane sulfonamide (FOSA)                         | mg/kg | < 0.0004 |  |  | 0.0004            | Pass        |                 |
| N-Methyl perfluorooctane sulfonamide (Me-FOSA)             | mg/kg | < 0.0004 |  |  | 0.0004            | Pass        |                 |
| N-Ethyl perfluorooctane sulfonamide (Et-FOSA)              | mg/kg | < 0.0004 |  |  | 0.0004            | Pass        |                 |
| Perfluorooctane sulfonamidoacetic acid (FOSAA)             | mg/kg | < 0.0004 |  |  | 0.0004            | Pass        |                 |
| N-Methyl perfluorooctane sulfonamidoacetic acid (Me-FOSAA) | mg/kg | < 0.0004 |  |  | 0.0004            | Pass        |                 |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (Et-FOSAA)  | mg/kg | < 0.0004 |  |  | 0.0004            | Pass        |                 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-Me-FOSE)    | mg/kg | < 0.0008 |  |  | 0.0008            | Pass        |                 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-Et-FOSE)     | mg/kg | < 0.0008 |  |  | 0.0008            | Pass        |                 |
| Sum of PFAS                                                | mg/kg | < 0.0002 |  |  | 0.0002            | Pass        |                 |
| Sum of PFHxS and PFOS                                      | mg/kg | < 0.0004 |  |  | 0.0004            | Pass        |                 |
| Sum of PFAS (WA DER List)                                  | mg/kg | < 0.0002 |  |  | 0.0002            | Pass        |                 |
| <b>LCS - % Recovery</b>                                    |       |          |  |  |                   |             |                 |
| <b>PFAS (Full Suite) Soil</b>                              |       |          |  |  |                   |             |                 |
| Perfluorobutanoic acid (PFBA)                              | %     | 113      |  |  | 50-130            | Pass        |                 |
| Perfluoropentanoic acid (PFPeA)                            | %     | 98       |  |  | 50-130            | Pass        |                 |
| Perfluorohexanoic acid (PFHxA)                             | %     | 101      |  |  | 50-130            | Pass        |                 |
| Perfluorooctanoic acid (PFOA)                              | %     | 110      |  |  | 50-130            | Pass        |                 |
| Perfluorononanoic acid (PFNA)                              | %     | 109      |  |  | 50-130            | Pass        |                 |
| Perfluorodecanoic acid (PFDA)                              | %     | 110      |  |  | 50-130            | Pass        |                 |
| Perfluoroundecanoic acid (PFUnDA)                          | %     | 107      |  |  | 50-130            | Pass        |                 |
| Perfluorododecanoic acid (PFDoDA)                          | %     | 98       |  |  | 50-130            | Pass        |                 |
| Perfluorotridecanoic acid (PFTTrDA)                        | %     | 80       |  |  | 50-130            | Pass        |                 |
| Perfluorotetradecanoic acid (PFTeDA)                       | %     | 106      |  |  | 50-130            | Pass        |                 |
| Perfluorobutane sulfonic acid (PFBS)                       | %     | 96       |  |  | 50-130            | Pass        |                 |
| Perfluoropentane sulfonic acid (PFPeS)                     | %     | 100      |  |  | 50-130            | Pass        |                 |
| Perfluorohexane sulfonic acid (PFHxS)                      | %     | 87       |  |  | 50-130            | Pass        |                 |
| Perfluoroheptane sulfonic acid (PFHpS)                     | %     | 112      |  |  | 50-130            | Pass        |                 |
| Perfluorooctane sulfonic acid (PFOS)                       | %     | 111      |  |  | 50-130            | Pass        |                 |
| Perfluorodecane sulfonic acid (PFDS)                       | %     | 99       |  |  | 50-130            | Pass        |                 |

| Test                                                       |               |           | Units | Result 1 |          |     | Acceptance Limits | Pass Limits | Qualifying Code |
|------------------------------------------------------------|---------------|-----------|-------|----------|----------|-----|-------------------|-------------|-----------------|
| 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                  |               |           | %     | 102      |          |     | 50-130            | Pass        |                 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                  |               |           | %     | 111      |          |     | 50-130            | Pass        |                 |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                  |               |           | %     | 105      |          |     | 50-130            | Pass        |                 |
| Perfluorooctane sulfonamide (FOSA)                         |               |           | %     | 108      |          |     | 50-130            | Pass        |                 |
| N-Methyl perfluorooctane sulfonamidoacetic acid (Me-FOSAA) |               |           | %     | 108      |          |     | 50-130            | Pass        |                 |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (Et-FOSAA)  |               |           | %     | 109      |          |     | 50-130            | Pass        |                 |
| Test                                                       | Lab Sample ID | QA Source | Units | Result 1 |          |     | Acceptance Limits | Pass Limits | Qualifying Code |
| <b>Duplicate</b>                                           |               |           |       |          |          |     |                   |             |                 |
|                                                            |               |           |       | Result 1 | Result 2 | RPD |                   |             |                 |
| % Moisture                                                 | L22-Jn0017290 | NCP       | %     | < 1      | < 1      | <1  | 30%               | Pass        |                 |
| <b>Duplicate</b>                                           |               |           |       |          |          |     |                   |             |                 |
| <b>PFAS (Full Suite) Soil</b>                              |               |           |       | Result 1 | Result 2 | RPD |                   |             |                 |
| Perfluorobutanoic acid (PFBA)                              | L22-Jn0065117 | NCP       | mg/kg | < 0.0008 | < 0.0008 | <1  | 30%               | Pass        |                 |
| Perfluoropentanoic acid (PFPeA)                            | L22-Jn0065117 | NCP       | mg/kg | < 0.0002 | < 0.0002 | <1  | 30%               | Pass        |                 |
| Perfluorohexanoic acid (PFHxA)                             | L22-Jn0065117 | NCP       | mg/kg | 0.0007   | 0.0007   | <1  | 30%               | Pass        |                 |
| Perfluoroheptanoic acid (PFHpA)                            | L22-Jn0065117 | NCP       | mg/kg | < 0.0008 | < 0.0008 | <1  | 30%               | Pass        |                 |
| Perfluorooctanoic acid (PFOA)                              | L22-Jn0065117 | NCP       | mg/kg | 0.0005   | 0.0005   | <1  | 30%               | Pass        |                 |
| Perfluorononanoic acid (PFNA)                              | L22-Jn0065117 | NCP       | mg/kg | < 0.0002 | < 0.0002 | <1  | 30%               | Pass        |                 |
| Perfluorodecanoic acid (PFDA)                              | L22-Jn0065117 | NCP       | mg/kg | < 0.0002 | < 0.0002 | <1  | 30%               | Pass        |                 |
| Perfluoroundecanoic acid (PFUnDA)                          | L22-Jn0065117 | NCP       | mg/kg | < 0.0002 | < 0.0002 | <1  | 30%               | Pass        |                 |
| Perfluorododecanoic acid (PFDoDA)                          | L22-Jn0065117 | NCP       | mg/kg | < 0.0002 | < 0.0002 | <1  | 30%               | Pass        |                 |
| Perfluorotridecanoic acid (PFTriDA)                        | L22-Jn0065117 | NCP       | mg/kg | < 0.0002 | < 0.0002 | <1  | 30%               | Pass        |                 |
| Perfluorotetradecanoic acid (PFTeDA)                       | L22-Jn0065117 | NCP       | mg/kg | < 0.0002 | < 0.0002 | <1  | 30%               | Pass        |                 |
| Perfluorobutane sulfonic acid (PFBS)                       | L22-Jn0065117 | NCP       | mg/kg | < 0.0004 | < 0.0004 | <1  | 30%               | Pass        |                 |
| Perfluoropentane sulfonic acid (PFPeS)                     | L22-Jn0065117 | NCP       | mg/kg | < 0.0004 | < 0.0004 | <1  | 30%               | Pass        |                 |
| Perfluorohexane sulfonic acid (PFHxS)                      | L22-Jn0065117 | NCP       | mg/kg | 0.0053   | 0.0058   | 9.5 | 30%               | Pass        |                 |
| Perfluoroheptane sulfonic acid (PFHpS)                     | L22-Jn0065117 | NCP       | mg/kg | < 0.0004 | < 0.0004 | <1  | 30%               | Pass        |                 |
| Perfluorooctane sulfonic acid (PFOS)                       | L22-Jn0065117 | NCP       | mg/kg | 0.066    | 0.064    | 3.0 | 30%               | Pass        |                 |
| Perfluorodecane sulfonic acid (PFDS)                       | L22-Jn0065117 | NCP       | mg/kg | < 0.0004 | < 0.0004 | <1  | 30%               | Pass        |                 |
| 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                  | L22-Jn0065117 | NCP       | mg/kg | < 0.0005 | < 0.0005 | <1  | 30%               | Pass        |                 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                  | L22-Jn0065117 | NCP       | mg/kg | < 0.0005 | < 0.0005 | <1  | 30%               | Pass        |                 |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                  | L22-Jn0065117 | NCP       | mg/kg | < 0.0005 | < 0.0005 | <1  | 30%               | Pass        |                 |
| 10:2 Fluorotelomer sulfonic acid (10:2 FTS)                | L22-Jn0065117 | NCP       | mg/kg | < 0.0005 | < 0.0005 | <1  | 30%               | Pass        |                 |
| Perfluorooctane sulfonamide (FOSA)                         | L22-Jn0065117 | NCP       | mg/kg | < 0.0004 | < 0.0004 | <1  | 30%               | Pass        |                 |
| N-Methyl perfluorooctane sulfonamide (Me-FOSA)             | L22-Jn0065117 | NCP       | mg/kg | < 0.0004 | < 0.0004 | <1  | 30%               | Pass        |                 |
| N-Ethyl perfluorooctane sulfonamide (Et-FOSA)              | L22-Jn0065117 | NCP       | mg/kg | < 0.0004 | < 0.0004 | <1  | 30%               | Pass        |                 |
| Perfluorooctane sulfonamidoacetic acid (FOSAA)             | L22-Jn0065117 | NCP       | mg/kg | < 0.0004 | < 0.0004 | <1  | 30%               | Pass        |                 |
| N-Methyl perfluorooctane sulfonamidoacetic acid (Me-FOSAA) | L22-Jn0065117 | NCP       | mg/kg | < 0.0004 | < 0.0004 | <1  | 30%               | Pass        |                 |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (Et-FOSAA)  | L22-Jn0065117 | NCP       | mg/kg | < 0.0004 | < 0.0004 | <1  | 30%               | Pass        |                 |

| Duplicate                                               |               |     |       |          |          |     |     |      |
|---------------------------------------------------------|---------------|-----|-------|----------|----------|-----|-----|------|
| PFAS (Full Suite) Soil                                  |               |     |       | Result 1 | Result 2 | RPD |     |      |
| N-Methyl perfluorooctane sulfonamidoethanol (N-Me-FOSE) | L22-Jn0065117 | NCP | mg/kg | < 0.0008 | < 0.0008 | <1  | 30% | Pass |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-Et-FOSE)  | L22-Jn0065117 | NCP | mg/kg | < 0.0008 | < 0.0008 | <1  | 30% | Pass |
| Sum of PFAS                                             | L22-Jn0065117 | NCP | mg/kg | 0.073    | 0.071    | 1.9 | 30% | Pass |
| Sum of PFHxS and PFOS                                   | L22-Jn0065117 | NCP | mg/kg | 0.072    | 0.070    | 2.0 | 30% | Pass |
| Sum of PFAS (WA DER List)                               | L22-Jn0065117 | NCP | mg/kg | 0.073    | 0.071    | 1.9 | 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  |

### Authorised by:

██████████  
██████████

Analytical Services Manager  
Senior Analyst-PFAS



██████████

### Business Unit 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

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.



Stantec Australia Pty Limited  
6F 226, Adelaide Terrace  
Perth  
WA 6000



NATA Accredited  
Accreditation Number 2377  
Site Number 2370

Accredited for compliance with ISO/IEC 17025 – Testing  
NATA is a signatory to the ILAC Mutual Recognition  
Arrangement for the mutual recognition of the  
equivalence of testing, medical testing, calibration,  
inspection, proficiency testing scheme providers and  
reference materials producers reports and certificates.

Attention:

Report **901145-W**  
Project name **WA\_0960\_PFASOMP**  
Project ID **WA\_0960\_PFASOMP**  
Received Date **Jun 28, 2022**

| Client Sample ID                                          |       |      | 0960_QC215_2<br>20622 | 0960_QC216_2<br>20622 | 0960_QC217_2<br>20622 | 0960_QC219_2<br>20622 |
|-----------------------------------------------------------|-------|------|-----------------------|-----------------------|-----------------------|-----------------------|
| Sample Matrix                                             |       |      | Water                 | Water                 | Water                 | Water                 |
| Eurofins Sample No.                                       |       |      | L22-Jn0061603         | L22-Jn0061604         | L22-Jn0061605         | L22-Jn0061607         |
| Date Sampled                                              |       |      | Jun 22, 2022          | Jun 22, 2022          | Jun 22, 2022          | Jun 22, 2022          |
| Test/Reference                                            | LOR   | Unit |                       |                       |                       |                       |
| <b>PFAS (Full Suite) Water Low</b>                        |       |      |                       |                       |                       |                       |
| Perfluorobutanoic acid (PFBA)                             | 0.008 | ug/L | 0.089                 | < 0.008               | 0.64                  | 0.044                 |
| Perfluoropentanoic acid (PFPeA)                           | 0.002 | ug/L | 0.042                 | 0.20                  | 1.0                   | 0.025                 |
| Perfluorohexanoic acid (PFHxA)                            | 0.001 | ug/L | 0.037                 | 0.97                  | 0.82                  | 0.017                 |
| Perfluoroheptanoic acid (PFHpA)                           | 0.004 | ug/L | 0.10                  | 0.10                  | 0.29                  | < 0.004               |
| Perfluorooctanoic acid (PFOA)                             | 0.001 | ug/L | 0.085                 | 0.25                  | 0.072                 | 0.014                 |
| Perfluorononanoic acid (PFNA)                             | 0.002 | ug/L | 0.014                 | 0.007                 | < 0.002               | < 0.002               |
| Perfluorodecanoic acid (PFDA)                             | 0.001 | ug/L | 0.004                 | 0.001                 | < 0.001               | < 0.001               |
| Perfluoroundecanoic acid (PFUnDA)                         | 0.001 | ug/L | < 0.001               | < 0.001               | < 0.001               | < 0.001               |
| Perfluorododecanoic acid (PFDoDA)                         | 0.001 | ug/L | < 0.001               | < 0.001               | < 0.001               | < 0.001               |
| Perfluorotridecanoic acid (PFTrDA)                        | 0.001 | ug/L | < 0.001               | < 0.001               | < 0.001               | < 0.001               |
| Perfluorotetradecanoic acid (PFTeDA)                      | 0.001 | ug/L | < 0.001               | < 0.001               | < 0.001               | < 0.001               |
| Perfluorobutane sulfonic acid (PFBS)                      | 0.002 | ug/L | 0.048                 | 0.95                  | 0.056                 | 0.15                  |
| Perfluoropentane sulfonic acid (PFPeS)                    | 0.002 | ug/L | 0.045                 | 0.67                  | 0.077                 | 0.20                  |
| Perfluorohexane sulfonic acid (PFHxS)                     | 0.002 | ug/L | 0.071                 | 2.7                   | 0.46                  | 0.11                  |
| Perfluoroheptane sulfonic acid (PFHpS)                    | 0.002 | ug/L | 0.010                 | 0.13                  | 0.030                 | 0.006                 |
| Perfluorooctane sulfonic acid (PFOS)                      | 0.004 | ug/L | 0.082                 | 0.99                  | 0.16                  | 0.034                 |
| Perfluorodecane sulfonic acid (PFDS)                      | 0.004 | ug/L | < 0.004               | < 0.004               | < 0.004               | < 0.004               |
| 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 0.008 | ug/L | < 0.008               | < 0.008               | < 0.008               | < 0.008               |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 0.008 | ug/L | < 0.008               | < 0.008               | < 0.008               | < 0.008               |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | 0.002 | ug/L | < 0.002               | < 0.002               | < 0.002               | < 0.002               |
| 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | 0.004 | ug/L | < 0.004               | < 0.004               | < 0.004               | < 0.004               |
| Perfluorooctane sulfonamide (FOSA)                        | 0.004 | ug/L | < 0.004               | < 0.004               | < 0.004               | < 0.004               |
| N-Methyl perfluorooctane sulfonamide (Me-FOSA)            | 0.004 | ug/L | < 0.004               | < 0.004               | < 0.004               | < 0.004               |
| N-Ethyl perfluorooctane sulfonamide (Et-FOSA)             | 0.004 | ug/L | < 0.004               | < 0.004               | < 0.004               | < 0.004               |
| Perfluorooctane sulfonamidoacetic acid (FOSAA)            | 0.002 | ug/L | < 0.002               | < 0.002               | < 0.002               | < 0.002               |
| N-Methylperfluorooctanesulfonamidoacetic acid (Me-FOSAA)  | 0.004 | ug/L | < 0.004               | < 0.004               | < 0.004               | < 0.004               |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (Et-FOSAA) | 0.004 | ug/L | < 0.004               | < 0.004               | < 0.004               | < 0.004               |
| N-Methyl perfluorooctane sulfonamidoethanol (N-Me-FOSE)   | 0.008 | ug/L | < 0.008               | < 0.008               | < 0.008               | < 0.008               |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-Et-FOSE)    | 0.008 | ug/L | < 0.008               | < 0.008               | < 0.008               | < 0.008               |
| Sum of PFAS                                               | 0.001 | ug/L | 0.63                  | 6.9                   | 3.7                   | 0.60                  |
| Sum of PFHxS and PFOS                                     | 0.002 | ug/L | 0.15                  | 3.7                   | 0.62                  | 0.14                  |
| Sum of PFAS (WA DER List)                                 | 0.001 | ug/L | 0.56                  | 6.1                   | 3.6                   | 0.39                  |

| Client Sample ID                                          |       |      | 0960_QC220_2<br>20622 | 0960_QC221_2<br>20622 | 0960_QC224_2<br>20622 | 0960_QC226_2<br>20623 |
|-----------------------------------------------------------|-------|------|-----------------------|-----------------------|-----------------------|-----------------------|
| Sample Matrix                                             |       |      | Water                 | Water                 | Water                 | Water                 |
| Eurofins Sample No.                                       |       |      | L22-Jn0061608         | L22-Jn0061609         | L22-Jn0061612         | L22-Jn0061614         |
| Date Sampled                                              |       |      | Jun 22, 2022          | Jun 22, 2022          | Jun 22, 2022          | Jun 23, 2022          |
| Test/Reference                                            | LOR   | Unit |                       |                       |                       |                       |
| <b>PFAS (Full Suite) Water Low</b>                        |       |      |                       |                       |                       |                       |
| Perfluorobutanoic acid (PFBA)                             | 0.008 | ug/L | 0.11                  | < 0.008               | < 0.008               | < 0.008               |
| Perfluoropentanoic acid (PFPeA)                           | 0.002 | ug/L | 0.041                 | < 0.002               | < 0.002               | < 0.002               |
| Perfluorohexanoic acid (PFHxA)                            | 0.001 | ug/L | 0.14                  | 0.003                 | < 0.001               | 0.003                 |
| Perfluoroheptanoic acid (PFHpA)                           | 0.004 | ug/L | 0.064                 | 0.013                 | < 0.004               | < 0.004               |
| Perfluorooctanoic acid (PFOA)                             | 0.001 | ug/L | 0.093                 | 0.001                 | < 0.001               | 0.002                 |
| Perfluorononanoic acid (PFNA)                             | 0.002 | ug/L | < 0.002               | < 0.002               | < 0.002               | < 0.002               |
| Perfluorodecanoic acid (PFDA)                             | 0.001 | ug/L | < 0.001               | < 0.001               | < 0.001               | < 0.001               |
| Perfluoroundecanoic acid (PFUnDA)                         | 0.001 | ug/L | < 0.001               | < 0.001               | < 0.001               | < 0.001               |
| Perfluorododecanoic acid (PFDoDA)                         | 0.001 | ug/L | < 0.001               | < 0.001               | < 0.001               | < 0.001               |
| Perfluorotridecanoic acid (PFTrDA)                        | 0.001 | ug/L | < 0.001               | < 0.001               | < 0.001               | < 0.001               |
| Perfluorotetradecanoic acid (PFTeDA)                      | 0.001 | ug/L | < 0.001               | < 0.001               | < 0.001               | < 0.001               |
| Perfluorobutane sulfonic acid (PFBS)                      | 0.002 | ug/L | 0.054                 | 0.002                 | < 0.002               | < 0.002               |
| Perfluoropentane sulfonic acid (PFPeS)                    | 0.002 | ug/L | 0.048                 | < 0.002               | < 0.002               | < 0.002               |
| Perfluorohexane sulfonic acid (PFHxS)                     | 0.002 | ug/L | 0.29                  | 0.008                 | < 0.002               | 0.007                 |
| Perfluoroheptane sulfonic acid (PFHpS)                    | 0.002 | ug/L | 0.071                 | < 0.002               | < 0.002               | < 0.002               |
| Perfluorooctane sulfonic acid (PFOS)                      | 0.004 | ug/L | 0.061                 | 0.044                 | < 0.004               | 0.059                 |
| Perfluorodecane sulfonic acid (PFDS)                      | 0.004 | ug/L | < 0.004               | < 0.004               | < 0.004               | < 0.004               |
| 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | 0.008 | ug/L | < 0.008               | < 0.008               | < 0.008               | < 0.008               |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | 0.008 | ug/L | 0.025                 | < 0.008               | < 0.008               | < 0.008               |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | 0.002 | ug/L | < 0.002               | < 0.002               | < 0.002               | < 0.002               |
| 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | 0.004 | ug/L | < 0.004               | < 0.004               | < 0.004               | < 0.004               |
| Perfluorooctane sulfonamide (FOSA)                        | 0.004 | ug/L | < 0.004               | < 0.004               | < 0.004               | < 0.004               |
| N-Methyl perfluorooctane sulfonamide (Me-FOSA)            | 0.004 | ug/L | < 0.004               | < 0.004               | < 0.004               | < 0.004               |
| N-Ethyl perfluorooctane sulfonamide (Et-FOSA)             | 0.004 | ug/L | < 0.004               | < 0.004               | < 0.004               | < 0.004               |
| Perfluorooctane sulfonamidoacetic acid (FOSAA)            | 0.002 | ug/L | < 0.002               | < 0.002               | < 0.002               | < 0.002               |
| N-Methylperfluorooctanesulfonamidoacetic acid (Me-FOSAA)  | 0.004 | ug/L | < 0.004               | < 0.004               | < 0.004               | < 0.004               |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (Et-FOSAA) | 0.004 | ug/L | < 0.004               | < 0.004               | < 0.004               | < 0.004               |
| N-Methyl perfluorooctane sulfonamidoethanol (N-Me-FOSE)   | 0.008 | ug/L | < 0.008               | < 0.008               | < 0.008               | < 0.008               |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-Et-FOSE)    | 0.008 | ug/L | < 0.008               | < 0.008               | < 0.008               | < 0.008               |
| Sum of PFAS                                               | 0.001 | ug/L | 0.99                  | 0.072                 | < 0.001               | 0.071                 |
| Sum of PFHxS and PFOS                                     | 0.002 | ug/L | 0.35                  | 0.053                 | < 0.002               | 0.066                 |
| Sum of PFAS (WA DER List)                                 | 0.001 | ug/L | 0.87                  | 0.072                 | < 0.001               | 0.071                 |

**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**

PFAS (Full Suite) Water Low

**Testing Site**

Welshpool

**Extracted**

Jul 05, 2022

**Holding Time**

28 Days

- Method: ARL510 - Per and Polyfluoroalkyl Substances in Water by LCMS



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**Company Name:** Stantec Australia Pty Ltd (WA)  
**Address:** 6F 226, Adelaide Terrace  
Perth  
WA 6000

**Project Name:** WA\_0960\_PFASOMP  
**Project ID:** WA\_0960\_PFASOMP

**Order No.:** PFAS-OMP 304700525  
**Report #:** 901145  
**Phone:** 0458 839 200  
**Fax:**

**Received:** Jun 28, 2022 11:38 AM  
**Due:** Jul 7, 2022  
**Priority:** 7 Day  
**Contact Name:** [REDACTED]

**Eurofins Analytical Services Manager :** [REDACTED]

### Sample Detail

Moisture Set

PFAS (Full Suite) Water Low

PFAS (Full Suite) Soil

#### Perth Laboratory - NATA # 2377 Site # 2370

#### External Laboratory

| No | Sample ID         | Sample Date  | Sampling Time | Matrix | LAB ID        |   |   |   |
|----|-------------------|--------------|---------------|--------|---------------|---|---|---|
| 1  | 0960_QC215_220622 | Jun 22, 2022 |               | Water  | L22-Jn0061603 |   | X |   |
| 2  | 0960_QC216_220622 | Jun 22, 2022 |               | Water  | L22-Jn0061604 |   | X |   |
| 3  | 0960_QC217_220622 | Jun 22, 2022 |               | Water  | L22-Jn0061605 |   | X |   |
| 4  | 0960_QC218_220622 | Jun 22, 2022 |               | Soil   | L22-Jn0061606 | X |   | X |
| 5  | 0960_QC219_220622 | Jun 22, 2022 |               | Water  | L22-Jn0061607 |   | X |   |
| 6  | 0960_QC220_220622 | Jun 22, 2022 |               | Water  | L22-Jn0061608 |   | X |   |
| 7  | 0960_QC221_220622 | Jun 22, 2022 |               | Water  | L22-Jn0061609 |   | X |   |
| 8  | 0960_QC222_220622 | Jun 22, 2022 |               | Soil   | L22-Jn0061610 | X |   | X |



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**Company Name:** Stantec Australia Pty Ltd (WA)  
**Address:** 6F 226, Adelaide Terrace  
Perth  
WA 6000

**Project Name:** WA\_0960\_PFASOMP  
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**Order No.:** PFAS-OMP 304700525  
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**Received:** Jun 28, 2022 11:38 AM  
**Due:** Jul 7, 2022  
**Priority:** 7 Day  
**Contact Name:** [REDACTED]

**Eurofins Analytical Services Manager :** [REDACTED]

#### Sample Detail

Moisture Set

PFAS (Full Suite) Water Low

PFAS (Full Suite) Soil

#### Perth Laboratory - NATA # 2377 Site # 2370

|                    |                   |              |  |       |               | X | X | X |
|--------------------|-------------------|--------------|--|-------|---------------|---|---|---|
| 9                  | 0960_QC223_220622 | Jun 22, 2022 |  | Soil  | L22-Jn0061611 | X |   | X |
| 10                 | 0960_QC224_220622 | Jun 22, 2022 |  | Water | L22-Jn0061612 |   | X |   |
| 11                 | 0960_QC225_220622 | Jun 22, 2022 |  | Soil  | L22-Jn0061613 | X |   | X |
| 12                 | 0960_QC226_220623 | Jun 23, 2022 |  | Water | L22-Jn0061614 |   | X |   |
| 13                 | 0960_QC227_220623 | Jun 23, 2022 |  | Soil  | L22-Jn0061615 | X |   | X |
| <b>Test Counts</b> |                   |              |  |       |               | 5 | 8 | 5 |

## Internal Quality Control Review and Glossary

### General

1. 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.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. 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

|                                                  |                                           |                                                                          |
|--------------------------------------------------|-------------------------------------------|--------------------------------------------------------------------------|
| <b>mg/kg:</b> milligrams per kilogram            | <b>mg/L:</b> milligrams per litre         | <b>µg/L:</b> micrograms per litre                                        |
| <b>ppm:</b> parts per million                    | <b>ppb:</b> parts per billion             | <b>%:</b> Percentage                                                     |
| <b>org/100 mL:</b> Organisms per 100 millilitres | <b>NTU:</b> Nephelometric Turbidity Units | <b>MPN/100 mL:</b> Most Probable Number of organisms per 100 millilitres |

### Terms

|                         |                                                                                                                                                                                                                                                                                               |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>APHA</b>             | American Public Health Association                                                                                                                                                                                                                                                            |
| <b>COC</b>              | Chain of Custody                                                                                                                                                                                                                                                                              |
| <b>CP</b>               | Client Parent - QC was performed on samples pertaining to this report                                                                                                                                                                                                                         |
| <b>CRM</b>              | Certified Reference Material (ISO17034) - reported as percent recovery.                                                                                                                                                                                                                       |
| <b>Dry</b>              | Where a moisture has been determined on a solid sample the result is expressed on a dry basis.                                                                                                                                                                                                |
| <b>Duplicate</b>        | A second piece of analysis from the same sample and reported in the same units as the result to show comparison.                                                                                                                                                                              |
| <b>LOR</b>              | Limit of Reporting.                                                                                                                                                                                                                                                                           |
| <b>LCS</b>              | Laboratory Control Sample - reported as percent recovery.                                                                                                                                                                                                                                     |
| <b>Method Blank</b>     | 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.                                                                                                                                |
| <b>NCP</b>              | 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.                                                                                                                            |
| <b>RPD</b>              | Relative Percent Difference between two Duplicate pieces of analysis.                                                                                                                                                                                                                         |
| <b>SPIKE</b>            | Addition of the analyte to the sample and reported as percentage recovery.                                                                                                                                                                                                                    |
| <b>SRA</b>              | Sample Receipt Advice                                                                                                                                                                                                                                                                         |
| <b>Surr - Surrogate</b> | The addition of a like compound to the analyte target and reported as percentage recovery.                                                                                                                                                                                                    |
| <b>TBTO</b>             | 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. |
| <b>TCLP</b>             | Toxicity Characteristic Leaching Procedure                                                                                                                                                                                                                                                    |
| <b>TEQ</b>              | Toxic Equivalency Quotient or Total Equivalence                                                                                                                                                                                                                                               |
| <b>QSM</b>              | US Department of Defense Quality Systems Manual Version 5.4                                                                                                                                                                                                                                   |
| <b>US EPA</b>           | United States Environmental Protection Agency                                                                                                                                                                                                                                                 |
| <b>WA DWER</b>          | 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

1. 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.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

## Quality Control Results

| Test                                                      | Units | Result 1 |  |  | Acceptance Limits | Pass Limits | Qualifying Code |
|-----------------------------------------------------------|-------|----------|--|--|-------------------|-------------|-----------------|
| <b>Method Blank</b>                                       |       |          |  |  |                   |             |                 |
| <b>PFAS (Full Suite) Water Low</b>                        |       |          |  |  |                   |             |                 |
| Perfluorobutanoic acid (PFBA)                             | ug/L  | < 0.008  |  |  | 0.008             | Pass        |                 |
| Perfluoropentanoic acid (PFPeA)                           | ug/L  | < 0.002  |  |  | 0.002             | Pass        |                 |
| Perfluorohexanoic acid (PFHxA)                            | ug/L  | < 0.001  |  |  | 0.001             | Pass        |                 |
| Perfluoroheptanoic acid (PFHpA)                           | ug/L  | < 0.004  |  |  | 0.004             | Pass        |                 |
| Perfluorooctanoic acid (PFOA)                             | ug/L  | < 0.001  |  |  | 0.001             | Pass        |                 |
| Perfluorononanoic acid (PFNA)                             | ug/L  | < 0.002  |  |  | 0.002             | Pass        |                 |
| Perfluorodecanoic acid (PFDA)                             | ug/L  | < 0.001  |  |  | 0.001             | Pass        |                 |
| Perfluoroundecanoic acid (PFUnDA)                         | ug/L  | < 0.001  |  |  | 0.001             | Pass        |                 |
| Perfluorododecanoic acid (PFDoDA)                         | ug/L  | < 0.001  |  |  | 0.001             | Pass        |                 |
| Perfluorotridecanoic acid (PFTTrDA)                       | ug/L  | < 0.001  |  |  | 0.001             | Pass        |                 |
| Perfluorotetradecanoic acid (PFTeDA)                      | ug/L  | < 0.001  |  |  | 0.001             | Pass        |                 |
| Perfluorobutane sulfonic acid (PFBS)                      | ug/L  | < 0.002  |  |  | 0.002             | Pass        |                 |
| Perfluoropentane sulfonic acid (PFPeS)                    | ug/L  | < 0.002  |  |  | 0.002             | Pass        |                 |
| Perfluorohexane sulfonic acid (PFHxS)                     | ug/L  | < 0.002  |  |  | 0.002             | Pass        |                 |
| Perfluoroheptane sulfonic acid (PFHpS)                    | ug/L  | < 0.002  |  |  | 0.002             | Pass        |                 |
| Perfluorooctane sulfonic acid (PFOS)                      | ug/L  | < 0.004  |  |  | 0.004             | Pass        |                 |
| Perfluorodecane sulfonic acid (PFDS)                      | ug/L  | < 0.004  |  |  | 0.004             | Pass        |                 |
| 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | ug/L  | < 0.008  |  |  | 0.008             | Pass        |                 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | ug/L  | < 0.008  |  |  | 0.008             | Pass        |                 |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | ug/L  | < 0.002  |  |  | 0.002             | Pass        |                 |
| 10:2 Fluorotelomer sulfonic acid (10:2 FTS)               | ug/L  | < 0.004  |  |  | 0.004             | Pass        |                 |
| Perfluorooctane sulfonamide (FOSA)                        | ug/L  | < 0.004  |  |  | 0.004             | Pass        |                 |
| N-Methyl perfluorooctane sulfonamide (Me-FOSA)            | ug/L  | < 0.004  |  |  | 0.004             | Pass        |                 |
| N-Ethyl perfluorooctane sulfonamide (Et-FOSA)             | ug/L  | < 0.004  |  |  | 0.004             | Pass        |                 |
| Perfluorooctane sulfonamidoacetic acid (FOSAA)            | ug/L  | < 0.002  |  |  | 0.002             | Pass        |                 |
| N-Methylperfluorooctanesulfonamidoacetic acid (Me-FOSAA)  | ug/L  | < 0.004  |  |  | 0.004             | Pass        |                 |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (Et-FOSAA) | ug/L  | < 0.004  |  |  | 0.004             | Pass        |                 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-Me-FOSE)   | ug/L  | < 0.008  |  |  | 0.008             | Pass        |                 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-Et-FOSE)    | ug/L  | < 0.008  |  |  | 0.008             | Pass        |                 |
| Sum of PFAS                                               | ug/L  | < 0.001  |  |  | 0.001             | Pass        |                 |
| Sum of PFHxS and PFOS                                     | ug/L  | < 0.002  |  |  | 0.002             | Pass        |                 |
| Sum of PFAS (WA DER List)                                 | ug/L  | < 0.001  |  |  | 0.001             | Pass        |                 |
| <b>LCS - % Recovery</b>                                   |       |          |  |  |                   |             |                 |
| <b>PFAS (Full Suite) Water Low</b>                        |       |          |  |  |                   |             |                 |
| Perfluorobutanoic acid (PFBA)                             | %     | 100      |  |  | 50-130            | Pass        |                 |
| Perfluoropentanoic acid (PFPeA)                           | %     | 94       |  |  | 50-130            | Pass        |                 |
| Perfluorohexanoic acid (PFHxA)                            | %     | 99       |  |  | 50-130            | Pass        |                 |
| Perfluoroheptanoic acid (PFHpA)                           | %     | 110      |  |  | 50-130            | Pass        |                 |
| Perfluorooctanoic acid (PFOA)                             | %     | 100      |  |  | 50-130            | Pass        |                 |
| Perfluorononanoic acid (PFNA)                             | %     | 99       |  |  | 50-130            | Pass        |                 |
| Perfluorodecanoic acid (PFDA)                             | %     | 105      |  |  | 50-130            | Pass        |                 |
| Perfluoroundecanoic acid (PFUnDA)                         | %     | 89       |  |  | 50-130            | Pass        |                 |
| Perfluorododecanoic acid (PFDoDA)                         | %     | 98       |  |  | 50-130            | Pass        |                 |
| Perfluorotridecanoic acid (PFTTrDA)                       | %     | 81       |  |  | 50-130            | Pass        |                 |
| Perfluorotetradecanoic acid (PFTeDA)                      | %     | 103      |  |  | 50-130            | Pass        |                 |
| Perfluorobutane sulfonic acid (PFBS)                      | %     | 109      |  |  | 50-130            | Pass        |                 |
| Perfluoropentane sulfonic acid (PFPeS)                    | %     | 109      |  |  | 50-130            | Pass        |                 |
| Perfluorohexane sulfonic acid (PFHxS)                     | %     | 99       |  |  | 50-130            | Pass        |                 |
| Perfluoroheptane sulfonic acid (PFHpS)                    | %     | 106      |  |  | 50-130            | Pass        |                 |
| Perfluorooctane sulfonic acid (PFOS)                      | %     | 94       |  |  | 50-130            | Pass        |                 |



| Test                                                      | Units | Result 1 |  |  | Acceptance Limits | Pass Limits | Qualifying Code |
|-----------------------------------------------------------|-------|----------|--|--|-------------------|-------------|-----------------|
| Perfluorodecane sulfonic acid (PFDS)                      | %     | 73       |  |  | 50-130            | Pass        |                 |
| 4:2 Fluorotelomer sulfonic acid (4:2 FTS)                 | %     | 104      |  |  | 50-130            | Pass        |                 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS)                 | %     | 113      |  |  | 50-130            | Pass        |                 |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS)                 | %     | 107      |  |  | 50-130            | Pass        |                 |
| Perfluorooctane sulfonamide (FOSA)                        | %     | 106      |  |  | 50-130            | Pass        |                 |
| N-Methylperfluorooctanesulfonamidoacetic acid (Me-FOSAA)  | %     | 106      |  |  | 50-130            | Pass        |                 |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (Et-FOSAA) | %     | 106      |  |  | 50-130            | 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  |

### Authorised by:

██████████  
██████████

Analytical Services Manager  
Senior Analyst-PFAS



██████████

### Business Unit Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

\* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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# APPENDIX

# D

FIELD RECORDS & CALIBRATION CERTIFICATES



now



| Monitoring Date | Monitoring Location | Sample_ID                 | Screen Interval (m) | Well type    | TOC (mAHD) | Well Depth (m) | SWL (mbTOC) | RWL (mAHD) | Observations                     | Sampling Method    | Temp (°C) | DO (mg/L) | EC (us/Cm) | TDS (mg/L) | pH   | Eh (mV) | QC Sample #  | Odour Comments | Colour             |
|-----------------|---------------------|---------------------------|---------------------|--------------|------------|----------------|-------------|------------|----------------------------------|--------------------|-----------|-----------|------------|------------|------|---------|--------------|----------------|--------------------|
| 22/06/2022      | MW016               |                           |                     | Single Level |            |                |             |            | Not found. MW238 sampled instead |                    |           |           |            |            |      |         |              |                |                    |
| 22/06/2022      | MW018               | 0960_MW018_220622         | 5.5-8.5_            | Single Level | 6.403      | 8.5            | 4.97        | 1.433      | Ants. QC117, QC217               | Hydrasleeve        | 29.8      | 3.06      | 2889       | 1878.5     | 7.93 | 28.9    | QC117, QC217 |                | Cloudy,Brown       |
| 22/06/2022      | MW021               | 0960_MW021_220622         | 5.6-8.6_            | Single Level | 6.745      | 8.6            | 5.35        | 1.395      |                                  | Hydrasleeve        | 27.9      | 2.48      | 4173       | 2717       | 7.92 | 25.6    |              |                | Clear              |
| 22/06/2022      | MW102               | 0960_MW102_220622         | 2.5-8.5_            | Single Level | 4.6266     | 8.5            | 3.795       | 0.832      |                                  | Hydrasleeve        | 27.9      | 0.98      | 88214      | 57265      | 7.06 | 56.2    |              |                | Cloudy             |
| 22/06/2022      | MW103               |                           | 1-5.8_              | Single Level | 2.2785     | 8.0            |             |            | No access due to flooding        |                    |           |           |            |            |      |         |              |                |                    |
| 22/06/2022      | MW104               | 0960_MW104_220622         | 1-6.5_              | Single Level | 2.7256     | 6.5            | 1.425       | 1.301      |                                  | Hydrasleeve        | 27.7      | 0.89      | 80922      | 52715      | 7.12 | 37      |              |                | Clear              |
| 22/06/2022      | MW105               | 0960_MW105_220622         | 2-8_                | Single Level | 3.7272     | 8              | 2.71        | 1.017      |                                  | Hydrasleeve        | 27.5      | 0.8       | 46173      | 30030      | 6.85 | 33      | QC119/219    |                | Clear              |
| 22/06/2022      | MW112               | 0960_MW112_220622         | 3-8_                | Single Level | 5.1191     | 8              | 3.88        | 1.239      |                                  | Hydrasleeve        | 27.7      | 0.88      | 12559      | 8164       | 7.17 | -183.2  |              |                | Clear              |
| 22/06/2022      | MW113               | 0960_MW113_220622         | 4-10_               | Single Level | 7.3165     | 10             | 5.915       | 1.401      |                                  | Hydrasleeve        | 28.8      | 2.54      | 10518      | 68383      | 7.12 | 42.1    |              |                | Cloudy,Brown       |
| 22/06/2022      | MW114               | 0960_MW114_220622         | 4-10_               | Single Level | 7.7467     | 10             | 6.32        | 1.427      |                                  | Hydrasleeve        | 28.7      | 1.4       | 8931       | 5804.5     | 7.14 | 34.7    |              |                | Cloudy,Brown       |
| 22/06/2022      | MW115               | 0960_MW115_220622         | 3-8_                | Single Level | 4.9133     | 8              | 3.82        | 1.093      |                                  | Hydrasleeve        | 28.6      | 0.7       | 33667      | 21886      | 6.89 | -208.8  |              |                | Clear              |
| 22/06/2022      | MW122               | 0960_MW122_220622         | 1.7-7.7_            | Single Level | 3.9702     | 7.7            | 3.05        | 0.92       | QC124, QC224                     | Hydrasleeve        | 28.4      | 1.11      | 33250      | 21612.5    | 7.56 | 41.3    | QC124, QC224 |                | Cloudy,Brown       |
| 22/06/2022      | MW124               | 0960_MW124_220622         | 1-6_                | Single Level | 2.9183     | 6              | 1.998       | 0.92       |                                  | Hydrasleeve        | 26.6      | 2.47      | 83833      | 54535      | 7.33 | 43.4    |              |                | Brown              |
| 22/06/2022      | MW126               | 0960_MW126_220622         | 2-8_                | Single Level | 4.5088     | 8              | 3.64        | 0.869      |                                  | Hydrasleeve        | 26.4      | 0.46      | 70710      | 45955      | 6.91 | 56.3    |              |                | Clear              |
| 22/06/2022      | MW127               | 0960_MW127_220622         | 2.5-8.5_            | Single Level | 5.6238     | 8.5            | 4.75        | 0.874      |                                  | Hydrasleeve        | 25.5      | 1.42      | 68237      | 44330      | 6.98 | 81.4    |              |                | Cloudy,Brown       |
| 23/06/2022      | MW134               | 0960_MW134_220623         | 1-5.7_              | Single Level | 2.5155     | 5.7            | 1.33        | 1.185      |                                  | Hydrasleeve        | 24.8      | 1.01      | 60852      | 39585      | 7.02 | 54.5    |              |                | Cloudy             |
| 23/06/2022      | MW135               | 0960_MW135_2.5-3_220623   | 2.5-3_              | Multi level  | 2.7781     | 3              | 1.61        | 1.168      |                                  | Peristaltic Pump   | 26.5      | 3.28      | 35374      | 22971      | 7.81 | 44.2    |              |                | Cloudy             |
| 22/06/2022      | MW137               | 0960_MW137_0.8-1.3_220622 | 0.8-1.3_            | Multi level  | 2.1687     | 1.3            | 0.94        | 1.229      |                                  | Peristaltic Pump   | 25.9      | 1.21      | 82874      | 53864      | 7.36 | -186.1  |              |                | Brown,Cloudy       |
| 22/06/2022      | MW138               | 0960_MW138_3-3.5_220622   | 3-3.5_              | Multi level  | 3.3074     | 3.5            | 2.145       | 1.162      |                                  | Peristaltic Pump   | 27.9      | 2.77      | 44998      | 29243.5    | 7.39 | 71      |              |                | Cloudy,Brown       |
| 22/06/2022      | MW139               | 0960_MW139_220622         | 2-7_                | Single Level | 4.1386     | 7              |             | 3          | 1.139                            | Hydrasleeve        | 29.9      | 0.4       | 67196      | 43745      | 6.95 | 38.3    |              |                | Clear              |
| 23/06/2022      | MW140               | 0960_MW140_1.5-2_220623   | 1.5-2_              | Multi level  | 2.4916     | 2              | 1.355       | 1.137      |                                  | Peristaltic Pump   | 24.4      | 3.04      | 53588      | 34840      | 7.71 | 47.4    |              |                | Yellow,Clear       |
| 23/06/2022      | MW141               | 0960_MW141_1.5-2_220623   | 1.5-2_              | Multi level  | 2.7999     | 2              | 1.745       | 1.055      |                                  | Peristaltic Pump   | 24.6      | 2.85      | 40799      | 26520      | 7.66 | 51.4    |              |                | Cloudy             |
| 22/06/2022      | MW143               | 0960_MW143_3-3.5_220622   | 3-3.5_              | Multi level  | 2.8174     | 3.5            | 1.975       | 0.842      |                                  | Peristaltic Pump   | 27.7      | 3.77      | 87832      | 57070      | 7.56 | 38.2    |              |                | Cloudy,Brown       |
| 22/06/2022      | MW144               | 0960_MW144_3-3.5_220622   | 3-3.5_              | Multi level  | 3.0481     | 3.5            | 1.97        | 1.078      |                                  | Peristaltic Pump   | 27.2      | 3.77      | 37044      | 24082.5    | 7.8  | 30.8    |              |                | Cloudy,Brown       |
| 22/06/2022      | MW145               | 0960_MW145_3-3.5_220622   | 3-3.5_              | Multi level  | 3.1416     | 3.5            | 2.045       | 1.097      |                                  | Peristaltic Pump   | 28.3      | 3.16      | 94315      | 61295      | 7.18 | 75.8    |              |                | Cloudy,Brown       |
| 22/06/2022      | MW146               | 0960_MW146_3-3.5_220622   | 3-3.5_              | Multi level  | 2.7937     | 3.5            | 1.77        | 1.024      |                                  | Peristaltic Pump   | 27.5      | 2.53      | 47830      | 31070      | 7.57 | 29.5    |              |                | Cloudy,Brown       |
| 23/06/2022      | MW147               | 0960_MW147_3-3.5_220623   | 3-3.5_              | Multi level  | 2.9123     | 3.5            | 1.89        | 1.022      |                                  | Peristaltic Pump   | 26.4      | 1.98      | 101321     | 65909      | 7.45 | 40.5    |              |                | Clear              |
| 22/06/2022      | MW148D              | 0960_MW148D_220622        | 14-20_              | Single Level | 3.5778     | 20             | 2.695       | 0.883      |                                  | Hydrasleeve        | 27.3      | 1.17      | 79860      | 52000      | 7.05 | 24      |              |                | Clear              |
| 22/06/2022      | MW148S              | 0960_MW148S_220622        | 2-8_                | Single Level | 3.6851     | 8              | 2.595       | 1.09       | QC116/216                        | Hydrasleeve        | 26.2      | 3.35      | 34512      | 22470      | 7.29 | 22.2    | QC116/216    |                | Cloudy,Brown       |
| 22/06/2022      | MW151               | 0960_MW151_220622         | 2-8_                | Single Level | 4.0631     | 8              | 3.02        | 1.043      |                                  | Hydrasleeve        | 26.1      | 1.69      | 14797      | 9633       | 6.97 | 51.3    |              |                | Cloudy,Brown       |
| 22/06/2022      | MW159               | 0960_MW159_220622         | 3-9_                | Single Level | 4.1895     | 9              | 3.1         | 1.089      |                                  | Hydrasleeve        | 28        | 0.87      | 21763      | 14027      | 6.79 | 35.6    |              |                | Clear              |
| 22/06/2022      | MW162               | 0960_MW162_220622         | 17-20_              | Single Level | 6.856      | 20             | 5.45        | 1.406      |                                  | Hydrasleeve        | 28.9      | 0.75      | 12776      | 8307       | 7.18 | 20.7    |              |                | Clear              |
| 22/06/2022      | MW163               | 0960_MW163_220622         | 17-20_              | Single Level | 6.7808     | 20             | 5.36        | 1.421      |                                  | Hydrasleeve        | 28.8      | 2.06      | 14218      | 9238       | 7.36 | -57.2   |              |                | Clear              |
| 22/06/2022      | MW164               | 0960_MW164_220622         | 17-20_              | Single Level | 6.7893     | 20             | 5.35        | 1.439      |                                  | Hydrasleeve        | 29.7      | 2.5       | 7102       | 4614       | 7.69 | -103.4  | QC120/220    |                | Clear              |
| 22/06/2022      | MW165               | 0960_MW165_220622         | 3-9_                | Single Level | 6.1043     | 9              | 4.63        | 1.474      |                                  | Hydrasleeve        | 26.8      | 1.99      | 3665       | 2382       | 8.06 | -162.2  |              |                | Clear              |
| 22/06/2022      | MW166               | 0960_MW166_220622         | 2.5-8.5_            | Single Level | 5.7441     | 8.5            | 4.3         | 1.444      |                                  | Hydrasleeve        | 26.5      | 2.29      | 2883       | 1874       | 7.86 | -144.8  | QC115/215    |                | Clear              |
| 22/06/2022      | MW167               | 0960_MW167_220622         | 2.5-8.5_            | Single Level | 6.2094     | 8.5            | 4.86        | 1.349      |                                  | Hydrasleeve        | 27.8      | 2.52      | 5297       | 3443       | 7.54 | -161.1  |              |                | Clear              |
| 22/06/2022      | MW168               | 0960_MW168_220622         | 2.5-8.5_            | Single Level | 6.1713     | 8.5            | 4.89        | 1.281      |                                  | Hydrasleeve        | 26.6      | 1.26      | 12256      | 7965       | 7    | -165.5  |              |                | Brown,Cloudy       |
| 22/06/2022      | MW170               | 0960_MW170_220622         | 2.5-8.5_            | Single Level | 5.639      | 8.5            | 4.56        | 1.079      |                                  | Hydrasleeve        | 28.1      | 2.8       | 41372      | 26890.5    | 7.14 | 38      |              |                | Clear              |
| 22/06/2022      | MW172               | 0960_MW172_220622         | 2.5-8.5_            | Single Level | 5.6193     | 8.5            | 4.533       | 1.086      |                                  | Hydrasleeve        | 29.3      | 2.17      | 33497      | 21775      | 7.04 | 47.9    |              |                | Clear              |
| 23/06/2022      | MW175               | 0960_MW175_4-4.5_220623   | 4-4.5_              | Multi level  | 4.7916     | 4.5            | 3.84        | 0.952      |                                  | Peristaltic Pump   | 27.6      | 1.35      | 3485       | 2262       | 7.82 | -108.5  |              | Stagnant smell | Cloudy,Brown,Black |
| 23/06/2022      | MW176               | 0960_MW176_1.5-2_220623   | 1.5-2_              | Multi level  | 2.1274     | 2              | 1.315       | 0.812      |                                  | Peristaltic Pump   | 24        | 2.55      | 53753      | 34905      | 7.47 | 89.7    |              |                | Cloudy,Brown       |
| 23/06/2022      | MW177               | 0960_MW177_1.5-2_220623   | 1.5-2_              | Multi level  | 2.2299     | 2              | 1.205       | 1.025      |                                  | Peristaltic Pump   | 24.6      | 1.49      | 91072      | 59150      | 7.2  | 69      |              |                | Cloudy,Brown       |
| 23/06/2022      | MW178               | 0960_MW178_2-2.5_220623   | 2-2.5_              | Multi level  | 2.1612     | 2.5            | 1.35        | 0.811      |                                  | Peristaltic Pump   | 22.6      | 3.9       | 63338      | 39065      | 6.95 | 109.7   |              |                | Cloudy,Brown       |
| 22/06/2022      | MW179               | 0960_MW179_1-1.5_220622   | 1-1.5_              | Multi level  | 2.222      | 1.5            | 0.9         | 1.322      |                                  | Peristaltic Pump   | 26.1      | 2.46      | 81954      | 53288      | 7.48 | -107.9  |              |                | Brown,Cloudy       |
| 23/06/2022      | MW180               | 0960_MW180_1-1.5_220623   | 1-1.5_              | Multi level  | 1.9179     | 1.5            | 0.85        | 1.068      |                                  | Peristaltic Pump   | 25.1      | 2.56      | 91570      | 59540      | 7.47 | 36.4    |              |                | Clear              |
| 23/06/2022      | MW181               | 0960_MW181_3.5-4_220623   | 3.5-4_              | Multi level  | 2.2773     | 4              | 1.3         | 0.977      |                                  | Peristaltic Pump   | 25.9      | 1.78      | 101760     | 66170      | 7.42 | 38      |              |                | Clear              |
| 22/06/2022      | MW211               | 0960_MW211_220622         | NA*                 | Single Level | 6.3409     | NA*            | 4.87        | 1.471      |                                  | Hydrasleeve        | 28.3      | 3.1       | 2061       | 1340       | 8.3  | -105.8  |              |                | Clear              |
| 22/06/2022      | MW233               | 0960_MW233_220622         | 4-7_                | Single Level | 6.262      | 7              | 4.8         | 1.462      |                                  | Hydrasleeve        | 27.4      | 2.71      | 1983       | 1287       | 8.3  | 5.7     |              |                | Cloudy,Brown       |
| 22/06/2022      | MW238               | 0960_MW238_220622         | 3.0-6.0_            | Single Level | 3.98       | 6              | 2.92        | 1.06       | Sampled instead of MW016         | Hydrasleeve        | 27.1      | 4.14      | 5913       | 3841.5     | 7.8  | 50.1    |              |                | Brown,Cloudy       |
| 23/06/2022      | OTH103              | 0960_OTH103_220623        |                     |              |            |                |             |            |                                  | Direct into Bottle | 25.2      | 0.85      | 53158      | 34580      | 7.85 | -77.7   |              | Salty          | Cloudy,Black       |
| 23/06/2022      | OTH106              | 0960_OTH106_220623        |                     |              |            |                |             |            |                                  | Direct into Bottle | 20.3      | 5.18      | 54602      | 35470      | 8.06 | 52.1    |              |                | Clear              |
| 23/06/2022      | OTH107              | 0960_OTH107_220623        |                     |              |            |                |             |            |                                  | Direct into Bottle | 20.3      | 5.16      | 53775      | 34989      | 7.79 | 58.8    |              |                | Clear              |
| 23/06/2022      | OTH129              | 0960_OTH129_220623        |                     |              |            |                |             |            |                                  | Direct into Bottle | 26.8      | 4.2       | 32596      | 20845.5    | 7.96 | 23.2    |              | Salty          | Clear,Cloudy       |
| 23/06/2022      | OTH132              | 0960_OTH132_220623        |                     |              |            |                |             |            |                                  | Direct into Bottle | 24.6      | 2.28      | 54880      | 35685      | 7.68 | 63.6    |              | Salty          | Clear              |
| 23/06/2022      | OTH134              | 0960_OTH134_220623        |                     |              |            |                |             |            |                                  | Direct into Bottle | 22.2      | 5.56      | 2625       | 1709.5     | 8.45 | 12.3    |              |                | Clear,Cloudy       |

Note: \*Bore log not available

| Monitoring Location | Date       | Sample ID         | Sampling Method    | Sample Depth (m) | Water Body Depth (m) | Flow Rate | Observations                | Temperature (°C) | DO (mg/L) | EC (us/Cm) | TDS (mg/L) | pH   | Eh (mV) | Water Colour | Turbidity |
|---------------------|------------|-------------------|--------------------|------------------|----------------------|-----------|-----------------------------|------------------|-----------|------------|------------|------|---------|--------------|-----------|
| SW001               | 23/06/2022 | 0960_SW001_220623 | Direct into Bottle | 0.1              | 0.15                 | Slow      |                             | 20               | 7.03      | 56519      | 36725      | 8.56 |         | 65.8 Clear   | Low       |
| SW108               | 22/06/2022 | 0960_SW108_220622 | Direct into Bottle | 0.1              | 0.3                  | Slow      |                             | 24.5             | 5.19      | 2377       | 1547       | 8.37 |         | 38.9 Brown   | Medium    |
| SW113               | 22/06/2022 |                   |                    |                  |                      |           | Dry                         |                  |           |            |            |      |         |              |           |
| SW114               | 22/06/2022 |                   |                    |                  |                      |           | Dry                         |                  |           |            |            |      |         |              |           |
| SW121               | 22/06/2022 |                   |                    |                  |                      |           | Dry                         |                  |           |            |            |      |         |              |           |
| SW122               | 22/06/2022 |                   |                    |                  |                      |           | Dry                         |                  |           |            |            |      |         |              |           |
| SW123               | 22/06/2022 |                   |                    |                  |                      |           | Dry                         |                  |           |            |            |      |         |              |           |
| SW124               | 22/06/2022 |                   |                    |                  |                      |           | Dry                         |                  |           |            |            |      |         |              |           |
| SW125               | 22/06/2022 |                   |                    |                  |                      |           | Dry                         |                  |           |            |            |      |         |              |           |
| SW157               | 22/06/2022 | 0960_SW157_220622 | Direct into Bottle | 0.1              | 0.3                  | Slow      |                             | 26.5             | 7.89      | 1872       | 1215.5     | 9.15 |         | 28.3 Cloudy  | Medium    |
| SW166               | 22/06/2022 |                   |                    |                  |                      |           | Dry                         |                  |           |            |            |      |         |              |           |
| SW168               | 22/06/2022 |                   |                    |                  |                      |           | Dry                         |                  |           |            |            |      |         |              |           |
| SW170               | 22/06/2022 | 0960_SW170_220622 | Direct into Bottle | 0.1              | 0.3                  | Slow      |                             | 20.6             | 3.63      | 324        | 210.6      | 8.61 |         | 36.6 Clear   | Low       |
| SW174               | 22/06/2022 |                   |                    |                  |                      |           | Dry                         |                  |           |            |            |      |         |              |           |
| SW176               | 22/06/2022 |                   |                    |                  |                      |           | Dry                         |                  |           |            |            |      |         |              |           |
| SW189               | 23/06/2022 | 0960_SW189_220623 | Direct into Bottle | 0.1              | 0.4                  | Slow      | QC126/226                   | 16.8             | 6.35      | 1260       | 819        | 7.49 |         | 48.7 Cloudy  | Medium    |
| SW190               | 23/06/2022 | 0960_SW190_220623 | Direct into Bottle | 0.1              | 0.2                  | Slow      |                             | 25.8             | 6.16      | 2607       | 1696.5     | 8.79 |         | 18.3 Clear   | Low       |
| SW192               | 23/06/2022 | 0960_SW192_220623 | Direct into Bottle | 0.1              | 0.3                  | Slow      |                             | 22.9             | 4.15      | 9358       | 6084       | 8.13 |         | 26.9 Clear   | Medium    |
| SW193               | 23/06/2022 | 0960_SW193_220623 | Direct into Bottle | 0.15             | 0.6                  | Slow      |                             | 22.9             | 6.99      | 2425       | 1579.5     | 8.43 |         | 19.8 Clear   | Low       |
| SW198               | 22/06/2022 |                   |                    |                  |                      |           | Dry                         |                  |           |            |            |      |         |              |           |
| SW199               | 22/06/2022 | 0960_SW199_220622 | Direct into Bottle | 0.1              | 0.2                  | Slow      | Recent rain                 | 26.8             | 1.99      | 2144       | 1391       | 7.68 |         | 12.3 Clear   | Medium    |
| SW200               | 22/06/2022 | 0960_SW200_220622 | Direct into Bottle | 0.1              | 0.25                 | Slow      | Recent rain, creek bed full | 25.8             | 5.76      | 253.4      | 163.4      | 8.16 |         | 30.2 Clear   | Low       |
| SW205               | 23/06/2022 | 0960_SW205_220623 | Direct into Bottle | 0.1              | 0.2                  | Slow      | Pooling water puddle        | 20.4             | 4.21      | 69153      | 44915      | 7.76 |         | 50.9 Clear   | Low       |
| SW207               | 23/06/2022 | 0960_SW207_220623 | Direct into Bottle | 0.1              | 0.8                  | Slow      |                             | 22.5             | 3.05      | 54623      | 35490      | 7.64 |         | 43 Clear     | Low       |
| SW208               | 23/06/2022 | 0960_SW208_220623 | Direct into Bottle | 0.1              | 1                    | Slow      |                             | 19.9             | 4.27      | 54508      | 35444      | 8    |         | 52.5 Clear   | Low       |
| SW209               | 22/06/2022 | 0960_SW209_220622 | Direct into Bottle | 0.1              | 0.4                  |           |                             | 21.4             | 3.48      | 36493      | 23698      | 7.79 |         | -144.9 Clear |           |
| SW210               | 22/06/2022 | 0960_SW210_220622 | Direct into Bottle | 0.1              | 0.2                  |           |                             | 24.8             | 4.17      | 46457      | 30192      | 7.65 |         | -124.5 Clear |           |
| SW211               | 23/06/2022 | 0960_SW211_220623 | Direct into Bottle | 0.1              | 0.15                 | Slow      |                             | 16.4             | 4.99      | 35813      | 23276.5    | 7.97 |         | 83.6 Clear   | Low       |
| SW219               | 22/06/2022 |                   |                    |                  |                      |           | Dry                         |                  |           |            |            |      |         |              |           |
| SW227               | 22/06/2022 | 0960_SW227_220622 | Direct into Bottle | 0.1              | 0.3                  | Slow      |                             | 22.9             | 1.28      | 1362       | 884        | 8    |         | 10 Clear     | Medium    |
| SW231               | 22/06/2022 |                   |                    |                  |                      |           | Dry                         |                  |           |            |            |      |         |              |           |
| SW234               | 22/06/2022 |                   |                    |                  |                      |           | Dry                         |                  |           |            |            |      |         |              |           |
| SW235               | 22/06/2022 |                   |                    |                  |                      |           | Dry                         |                  |           |            |            |      |         |              |           |
| SW243               | 22/06/2022 |                   |                    |                  |                      |           | Dry                         |                  |           |            |            |      |         |              |           |
| SW265               | 22/06/2022 | 0960_SW265_220622 | Direct into Bottle | 0.1              | 0.2                  | Slow      | QC121/221                   | 25.1             | 7.44      | 3528       | 2294.5     | 9.08 |         | 34.1 Brown   | Medium    |
| SW277               | 22/06/2022 |                   |                    |                  |                      |           | Dry                         |                  |           |            |            |      |         |              |           |
| SW278               | 22/06/2022 |                   |                    |                  |                      |           | Dry                         |                  |           |            |            |      |         |              |           |
| SW279               | 22/06/2022 |                   |                    |                  |                      |           | Dry                         |                  |           |            |            |      |         |              |           |
| SW288               | 23/06/2022 | 0960_SW288_220623 | Direct into Bottle | 0.1              | 0.3                  | Slow      |                             | 25.4             | 6.18      | 1753       | 1137.5     | 8.82 |         | 41 Clear     | Low       |
| SW291               | 22/06/2022 |                   |                    |                  |                      |           | Dry                         |                  |           |            |            |      |         |              |           |
| SW292               | 22/06/2022 |                   |                    |                  |                      |           | Dry                         |                  |           |            |            |      |         |              |           |
| SW293               | 22/06/2022 |                   |                    |                  |                      |           | Dry                         |                  |           |            |            |      |         |              |           |
| SW298               | 23/06/2022 | 0960_SW298_220623 | Direct into Bottle | 0.2              | 0.5                  | Slow      |                             | 19.2             | 4.65      | 1147       | 747.5      | 8.49 |         | 44 Clear     | Low       |
| SW300               | 23/06/2022 | 0960_SW300_220623 | Direct into Bottle | 0.1              | 0.15                 | Slow      |                             | 16.1             | 5.93      | 35690      | 23205      | 8.13 |         | 82 Clear     | Low       |
| SW301               | 23/06/2022 | 0960_SW301_220623 | Direct into Bottle | 0.1              | 0.15                 | Slow      | Pooling water               | 22.1             | 4.21      | 90882      | 59150      | 8    |         | 51.1 Clear   | Low       |
| SW302               | 22/06/2022 | 0960_SW302_220622 | Direct into Bottle | 0.1              | 0.3                  |           |                             | 23.7             | 4.96      | 31687      | 20595      | 7.92 |         | -115.5 Clear |           |
| SW303               | 23/06/2022 | 0960_SW303_220623 | Direct into Bottle | 0.1              | 0.3                  | Slow      |                             | 19               | 3.2       | 33928      | 22048      | 7.85 |         | 37.3 Clear   | Low       |
| SW304               | 23/06/2022 | 0960_SW304_220623 | Direct into Bottle | 0.1              | 0.2                  | Slow      |                             | 18.8             | 3.56      | 36381      | 23601.5    | 7.66 |         | 71.6 Clear   | Low       |
| SW305               | 23/06/2022 | 0960_SW305_220623 | Direct into Bottle | 0.05             | 0.1                  | Slow      |                             | 22.9             | 7         | 37163      | 24206      | 8.07 |         | 67.5 Clear   | Low       |

| Monitoring Site ID | Date       | Sample ID         | Depth of Sediment |  | Sampling Method | Sample Condition | Sample Description                                | Other SS Site Comments ? |
|--------------------|------------|-------------------|-------------------|--|-----------------|------------------|---------------------------------------------------|--------------------------|
|                    |            |                   | Sampling (m)      |  |                 |                  |                                                   |                          |
| SD199              | 22/06/2022 | 0960_SD199_220622 | 0.1               |  | Shovel, Trowel  | Wet              | Red, CLAY, wet                                    | Recent rain              |
| SD200              | 22/06/2022 | 0960_SD200_220622 | 0.1               |  | Shovel, Trowel  | Wet              | Red CLAY, wet                                     | Recent rain, creek full  |
| SD205              | 23/06/2022 | 0960_SD205_220623 | 0.1               |  | Shovel, Trowel  | Wet              | Brown sand                                        |                          |
| SD207              | 23/06/2022 | 0960_SD207_220623 | 0.1               |  | Shovel, Trowel  | Wet              | Brown clayey sand                                 |                          |
| SD208              | 23/06/2022 | 0960_SD208_220623 | 0.1               |  | Shovel, Trowel  | Wet              | Grey coarse sand                                  | QC127/227                |
| SD209              | 22/06/2022 | 0960_SD209_220622 | 0.1               |  | Shovel, Trowel  | Wet              | Brown, muddy, no odour                            |                          |
| SD210              | 22/06/2022 | 0960_SD210_220622 | 0.1               |  | Shovel, Trowel  | Wet              | Brown, muddy, no odour                            |                          |
| SD211              | 23/06/2022 | 0960_SD211_220623 | 0.1               |  | Shovel, Trowel  | Wet              | Brown/grey CLAY, wet                              |                          |
| SD219              | 22/06/2022 | 0960_SD219_220622 | 0.1               |  | Shovel, Trowel  | Dry              | Moist brown clay                                  |                          |
| SD300              | 23/06/2022 | 0960_SD300_220623 | 0.1               |  | Shovel, Trowel  | Wet              | Brown/grey CLAY, wet                              |                          |
| SD301              | 23/06/2022 | 0960_SD301_220623 | 0.1               |  | Shovel, Trowel  | Wet              | Grey/brown CLAY, wet                              |                          |
| SD302              | 22/06/2022 | 0960_SD302_220622 | 0.1               |  | Shovel, Trowel  | Wet              | Brown, muddy, no odour                            |                          |
| SD303              | 23/06/2022 | 0960_SD303_220623 | 0.15              |  | Shovel, Trowel  | Wet              | Brown/grey clayey SAND, wet                       |                          |
| SD304              | 23/06/2022 | 0960_SD304_220623 | 0.1               |  | Shovel, Trowel  | Wet              | Brown/grey SAND, fine to medium, wet              |                          |
| SD305              | 23/06/2022 | 0960_SD305_220623 | 0.1               |  | Shovel, Trowel  | Wet              | Brown SAND, fine to med grained, wet              |                          |
| SS108              | 22/06/2022 | 0960_SS108_220622 | 0.1               |  | Shovel, Trowel  | Wet              | Soft brown clay                                   | SW taken                 |
| SS113              | 22/06/2022 | 0960_SS113_220622 | 0.1               |  | Shovel, Trowel  | Dry              | Brown clay                                        |                          |
| SS114              | 22/06/2022 | 0960_SS114_220622 | 0.1               |  | Shovel, Trowel  | Dry              | Moist brown gravelly clay                         |                          |
| SS121              | 22/06/2022 | 0960_SS121_220622 | 0.1               |  | Shovel, Trowel  | Dry              | Brown/red, sandy, no odour                        |                          |
| SS122              | 22/06/2022 | 0960_SS122_220622 | 0.1               |  | Shovel, Trowel  | Dry              | Brown/red, sandy, no odour                        |                          |
| SS123              | 22/06/2022 | 0960_SS123_220622 | 0.1               |  | Shovel, Trowel  | Dry              | Red, sandy CLAY, med to fine grain, slighty moist | QC118, QC218             |
| SS124              | 22/06/2022 | 0960_SS124_220622 | 0.1               |  | Shovel, Trowel  | Dry              | Stiff brown clay                                  |                          |
| SS125              | 22/06/2022 | 0960_SS125_220622 | 0.1               |  | Shovel, Trowel  | Dry              | Stiff brown clay                                  |                          |
| SS157              | 22/06/2022 | 0960_SS157_220622 | 0.1               |  | Shovel, Trowel  | Wet              | Brown clay                                        |                          |
| SS166              | 22/06/2022 | 0960_SS166_220622 | 0.1               |  | Shovel, Trowel  | Wet              | Stiff clay brown                                  |                          |
| SS168              | 22/06/2022 | 0960_SS168_220622 | 0.1               |  | Shovel, Trowel  | Dry              | Stiff brown clay                                  |                          |
| SS170              | 22/06/2022 | 0960_SS170_220622 | 0.1               |  | Shovel, Trowel  | Wet              | Soft clay                                         |                          |
| SS174              | 22/06/2022 | 0960_SS174_220622 | 0.1               |  | Shovel, Trowel  | Dry              | Stiff brown clay                                  |                          |
| SS176              | 22/06/2022 | 0960_SS176_220622 | 0.1               |  | Shovel, Trowel  | Dry              | Orange sandy clay. moist                          |                          |
| SS189              | 23/06/2022 | 0960_SS189_220623 | 0.1               |  | Shovel, Trowel  | Wet              | Brown clay                                        |                          |
| SS190              | 23/06/2022 | 0960_SS190_220623 | 0.1               |  | Shovel, Trowel  | Wet              | Red CLAY                                          |                          |
| SS192              | 23/06/2022 | 0960_SS192_220623 | 0.1               |  | Shovel, Trowel  | Wet              | Red/brown SAND, fine to med grained               |                          |
| SS193              | 23/06/2022 | 0960_SS193_220623 | 0.15              |  | Shovel, Trowel  | Wet              | Red SAND, fine grained                            |                          |
| SS198              | 22/06/2022 | 0960_SS198_220622 | 0.1               |  | Shovel, Trowel  | Dry              | Red/brown clayey SAND, slightly moist             |                          |
| SS227              | 22/06/2022 | 0960_SS227_220622 | 0.1               |  | Shovel, Trowel  | Wet              | Red Clay, wet                                     | QC123, QC223             |
| SS231              | 22/06/2022 | 0960_SS231_220622 | 0.1               |  | Shovel, Trowel  | Dry              | Gravelly orange clay                              |                          |
| SS234              | 22/06/2022 | 0960_SS234_220622 | 0.1               |  | Shovel, Trowel  | Dry              | Moist brown clay                                  |                          |
| SS235              | 22/06/2022 | 0960_SS235_220622 | 0.1               |  | Shovel, Trowel  | Wet              | Brown clay                                        |                          |
| SS243              | 22/06/2022 | 0960_SS243_220622 | 0.1               |  | Shovel, Trowel  | Dry              | Stiff brown clay                                  |                          |
| SS265              | 22/06/2022 | 0960_SS265_220622 | 0.1               |  | Shovel, Trowel  | Wet              | Soft brown sandy clay                             |                          |
| SS277              | 22/06/2022 | 0960_SS277_220622 | 0.1               |  | Shovel, Trowel  | Dry              | Fine brown clay                                   |                          |
| SS278              | 22/06/2022 | 0960_SS278_220622 | 0.1               |  | Shovel, Trowel  | Dry              | Brown clay                                        | QC125/225                |
| SS279              | 22/06/2022 | 0960_SS279_220622 | 0.1               |  | Shovel, Trowel  | Dry              | Stiff brown clay                                  |                          |
| SS288              | 23/06/2022 | 0960_SS288_220623 | 0.1               |  | Shovel, Trowel  | Wet              | Brown sandy clay                                  |                          |
| SS291              | 22/06/2022 | 0960_SS291_220622 | 0.1               |  | Shovel, Trowel  | Wet              | Red/brown CLAY, moist                             |                          |
| SS292              | 22/06/2022 | 0960_SS292_220622 | 0.1               |  | Shovel, Trowel  | Dry              | Red clayey SAND, fine grained, slightly moist     |                          |
| SS293              | 22/06/2022 | 0960_SS293_220622 | 0.1               |  | Shovel, Trowel  | Dry              | Brown clay, moist                                 | QC122, QC222             |
| SS298              | 23/06/2022 | 0960_SS298_220623 | 0.1               |  | Shovel, Trowel  | Wet              | Orange clay                                       |                          |
| SS301              | 23/06/2022 | 0960_SS301_220623 | 0.1               |  | Shovel, Trowel  | Wet              | Soft brown clay                                   |                          |



## Calibration Report

### Multi-Parameter Water Quality Instrument

Customer: Stantec

Contact: [REDACTED]

Manufacturer: YSI

Instrument: Professional Plus with Quatro cable

Serial #: 21D101799

Cable length: 1m 21B100351

| Item                    | Test                                                     | Pass | Comments                                             |
|-------------------------|----------------------------------------------------------|------|------------------------------------------------------|
| Battery                 | 2 x Alkaline C-cells                                     | ✓    | Voltage reading above 2.9V                           |
|                         | Battery Saver                                            | ✓    | Automatically turns off after 30 minutes if not used |
| Connections             | Condition                                                | ✓    | Good, clean                                          |
| Cable                   | Condition                                                | ✓    | Clean, no tears                                      |
| Display                 | Operation                                                | ✓    |                                                      |
| Firmware                | Version                                                  | ✓    | 0.0.78                                               |
| Keypad                  | Operational                                              | ✓    |                                                      |
| Display                 | Screen                                                   | ✓    |                                                      |
| Unit                    | Condition, seals and O-rings                             | ✓    |                                                      |
| Monitor housing         | Condition                                                | ✓    |                                                      |
| <b>pH</b>               |                                                          |      |                                                      |
|                         | Condition                                                | ✓    | Good, clean                                          |
|                         | pH millivolts for pH7 calibration range 0 mV ± 50 mV     | ✓    |                                                      |
|                         | pH 4 mV range + 165 to + 180 from 7 buffer mV value      | ✓    | 172.10 mV                                            |
|                         | pH slope                                                 | ✓    | 55 to 60 mV/pH, ideal 59mV 58.01                     |
|                         | Response time < 90 seconds                               | ✓    |                                                      |
|                         | Calibrated and conforms to manufacturer's specifications | ✓    |                                                      |
| <b>ORP</b>              |                                                          |      |                                                      |
|                         | Condition                                                | ✓    | Good, clean                                          |
|                         | Response time < 90 seconds                               | ✓    |                                                      |
|                         | within ± 80mv of reference Zobell Reading                | ✓    |                                                      |
|                         | Calibrated and conforms to manufacturer's specifications | ✓    | variance range ± 20mV 10 mV                          |
| <b>Conductivity</b>     |                                                          |      |                                                      |
|                         | Condition                                                | ✓    | Good, clean                                          |
|                         | Temperature                                              | ✓    | °C                                                   |
|                         | Conductivity cell constant 5.0 ± 1.0 in GLP file         | ✓    |                                                      |
|                         | Clean sensor reads less than 3 uS/cm in dry air          | ✓    |                                                      |
|                         | Calibrated and conforms to manufacturer's specifications | ✓    | µS/cm                                                |
| <b>Dissolved Oxygen</b> |                                                          |      |                                                      |
|                         | Condition                                                | ✓    | Good, clean                                          |
|                         | DO sensor in use                                         | ✓    | Galvanic                                             |
|                         | 1.25 mil PE membrane (yellow membrane):                  | ✓    |                                                      |
|                         | DO Sensor Value                                          | ✓    | (min 4.31 uA - max 8.00 uA) Avg 6.15 uA              |
|                         | Calibrated and conforms to manufacturer's specifications | ✓    | ppm                                                  |

This is to certify that the above instrument has been calibrated to the following specifications:

| Parameter                | Standards                | Reference | Calibration Point | Span   | Units | Instrument Readings |       |       |
|--------------------------|--------------------------|-----------|-------------------|--------|-------|---------------------|-------|-------|
|                          |                          |           |                   |        |       | Before              | After | Units |
| Temperature              | Check Temp NATA          | Room Temp | 19.5              | 0      | °C    | NA                  | 19.5  | °C    |
| pH (21E)                 | pH 7.00                  | 375757    | 7.01              | -30.90 | mV    | 7.02                | 7.01  | pH    |
| pH (21E)                 | pH 4.00                  | 378281    | 4.00              | 141.20 | mV    | 4.02                | 4.00  | pH    |
| Conductivity (21B100530) | 2764 µS/cm at 25°C       | 21/1012   | 2764              | GLP    | 5.02  | 2777                | 2764  | µS/cm |
| ORP (210322SIA605102)    | Zobell A & B             | 21/1611   | 241               | 241    | mV    | 227.1               | 231   | mV    |
| Zero DO (20K100253)      | NaSO3 in distilled water | 10175     | 0.0               | NA     | NA    | -2.1                | 0.0   | %     |
| 100% DO (20K100253)      | 100% Air Saturation      | Air       | 100.0             | 4.8    | uA    | 97.2                | 100.0 | %     |

Calibrated by: Gaurav Kanwar

Calibration Date: 15-Jun-22

Next Due: 12-Dec-22





## Calibration Report

### Multi-Parameter Water Quality Instrument

Customer: Stantec

Contact: [REDACTED]

Manufacturer: YSI

Instrument: Professional Plus with Quatro cable

Serial #: 20K104050

Cable length: 1m 20K100096

| Item                    | Test                                                     | Pass | Comments                                             |
|-------------------------|----------------------------------------------------------|------|------------------------------------------------------|
| Battery                 | 2 x Alkaline C-cells                                     | ✓    | Voltage reading above 2.9V                           |
|                         | Battery Saver                                            | ✓    | Automatically turns off after 30 minutes if not used |
| Connections             | Condition                                                | ✓    | Good, clean                                          |
| Cable                   | Condition                                                | ✓    | Clean, no tears                                      |
| Display                 | Operation                                                | ✓    |                                                      |
| Firmware                | Version                                                  | ✓    | 4.0.0                                                |
| Keypad                  | Operational                                              | ✓    |                                                      |
| Display                 | Screen                                                   | ✓    |                                                      |
| Unit                    | Condition, seals and O-rings                             | ✓    |                                                      |
| Monitor housing         | Condition                                                | ✓    |                                                      |
| <b>pH</b>               |                                                          |      |                                                      |
|                         | Condition                                                | ✓    | Good, clean                                          |
|                         | pH millivolts for pH7 calibration range 0 mV ± 50 mV     | ✓    |                                                      |
|                         | pH 4 mV range + 165 to + 180 from 7 buffer mV value      | ✓    | 172.90 mV                                            |
|                         | pH slope                                                 | ✓    | 55 to 60 mV/pH, ideal 59mV 58.44                     |
|                         | Response time < 90 seconds                               | ✓    |                                                      |
|                         | Calibrated and conforms to manufacturer's specifications | ✓    |                                                      |
| <b>ORP</b>              |                                                          |      |                                                      |
|                         | Condition                                                | ✓    | Good, clean                                          |
|                         | Response time < 90 seconds                               | ✓    |                                                      |
|                         | within ± 80mv of reference Zobell Reading                | ✓    |                                                      |
|                         | Calibrated and conforms to manufacturer's specifications | ✓    | variance range ± 20mV 3 mV                           |
| <b>Conductivity</b>     |                                                          |      |                                                      |
|                         | Condition                                                | ✓    | Good, clean                                          |
|                         | Temperature                                              | ✓    | °C                                                   |
|                         | Conductivity cell constant 5.0 ± 1.0 in GLP file         | ✓    |                                                      |
|                         | Clean sensor reads less than 3 uS/cm in dry air          | ✓    |                                                      |
|                         | Calibrated and conforms to manufacturer's specifications | ✓    | µS/cm                                                |
| <b>Dissolved Oxygen</b> |                                                          |      |                                                      |
|                         | Condition                                                | ✓    | Good, clean                                          |
|                         | DO sensor in use                                         | ✓    | Galvanic                                             |
|                         | 1.25 mil PE membrane (yellow membrane):                  | ✓    |                                                      |
|                         | DO Sensor Value                                          | ✓    | (min 4.31 uA - max 8.00 uA) Avg 6.15 uA              |
|                         | Calibrated and conforms to manufacturer's specifications | ✓    | ppm                                                  |

This is to certify that the above instrument has been calibrated to the following specifications:

| Parameter                | Standards                | Reference | Calibration Point | Span   | Units | Instrument Readings |       |       |
|--------------------------|--------------------------|-----------|-------------------|--------|-------|---------------------|-------|-------|
|                          |                          |           |                   |        |       | Before              | After | Units |
| Temperature              | Check Temp NATA          | Room Temp | 18.3              | -0.1   | °C    | NA                  | 18.2  | °C    |
| pH (21A)                 | pH 7.00                  | 375757    | 7.01              | -29.40 | mV    | 7.02                | 7.01  | pH    |
| pH (21A)                 | pH 4.00                  | 378281    | 4.00              | 143.50 | mV    | 3.99                | 4.00  | pH    |
| Conductivity (20K100397) | 2764 µS/cm at 25°C       | 21/1012   | 2764              | GLP    | 5.03  | 2770                | 2764  | µS/cm |
| ORP (201005SIA605102)    | Zobell A & B             | 21/1611   | 244               | 244    | mV    | 243.5               | 240.8 | mV    |
| Zero DO (20H100139)      | NaSO3 in distilled water | 10175     | 0.0               | NA     | NA    | 0.1                 | 0.0   | %     |
| 100% DO (20H100139)      | 100% Air Saturation      | Air       | 100.0             | 4.45   | uA    | 95.2                | 100.0 | %     |

Calibrated by: Gaurav Kanwar

Calibration Date: 12-Jun-22

Next Due: 09-Dec-22



## Calibration Report

### Multi-Parameter Water Quality Instrument

Customer: Stantec

Contact: [REDACTED]

Manufacturer: YSI

Instrument: Professional Plus with Quatro cable

Serial #: 20D101040

Cable length: 1m 20B140029

| Item                    | Test                                                     | Pass | Comments                                             |
|-------------------------|----------------------------------------------------------|------|------------------------------------------------------|
| Battery                 | 2 x Alkaline C-cells                                     | ✓    | Voltage reading above 2.9V                           |
|                         | Battery Saver                                            | ✓    | Automatically turns off after 30 minutes if not used |
| Connections             | Condition                                                | ✓    | Good, clean                                          |
| Cable                   | Condition                                                | ✓    | Clean, no tears                                      |
| Display                 | Operation                                                | ✓    |                                                      |
| Firmware                | Version                                                  | ✓    | 4.0.0                                                |
| Keypad                  | Operational                                              | ✓    |                                                      |
| Display                 | Screen                                                   | ✓    |                                                      |
| Unit                    | Condition, seals and O-rings                             | ✓    |                                                      |
| Monitor housing         | Condition                                                | ✓    |                                                      |
| <b>pH</b>               |                                                          |      |                                                      |
|                         | Condition                                                | ✓    | Good, clean                                          |
|                         | pH millivolts for pH7 calibration range 0 mV ± 50 mV     | ✓    |                                                      |
|                         | pH 4 mV range + 165 to + 180 from 7 buffer mV value      | ✓    | 171.60 mV                                            |
|                         | pH slope                                                 | ✓    | 55 to 60 mV/pH, ideal 59mV 58                        |
|                         | Response time < 90 seconds                               | ✓    |                                                      |
|                         | Calibrated and conforms to manufacturer's specifications | ✓    |                                                      |
| <b>ORP</b>              |                                                          |      |                                                      |
|                         | Condition                                                | ✓    | Good, clean                                          |
|                         | Response time < 90 seconds                               | ✓    |                                                      |
|                         | within ± 80mv of reference Zobell Reading                | ✓    |                                                      |
|                         | Calibrated and conforms to manufacturer's specifications | ✓    | variance range ± 20mV 3 mV                           |
| <b>Conductivity</b>     |                                                          |      |                                                      |
|                         | Condition                                                | ✓    | Good, clean                                          |
|                         | Temperature                                              | ✓    | °C                                                   |
|                         | Conductivity cell constant 5.0 ± 1.0 in GLP file         | ✓    |                                                      |
|                         | Clean sensor reads less than 3 uS/cm in dry air          | ✓    |                                                      |
|                         | Calibrated and conforms to manufacturer's specifications | ✓    | µS/cm                                                |
| <b>Dissolved Oxygen</b> |                                                          |      |                                                      |
|                         | Condition                                                | ✓    | Good, clean                                          |
|                         | DO sensor in use                                         | ✓    | Galvanic                                             |
|                         | 1.25 mil PE membrane (yellow membrane):                  | ✓    |                                                      |
|                         | DO Sensor Value                                          | ✓    | (min 4.31 uA - max 8.00 uA) Avg 6.15 uA              |
|                         | Calibrated and conforms to manufacturer's specifications | ✓    | ppm                                                  |

This is to certify that the above instrument has been calibrated to the following specifications:

| Parameter                | Standards                | Reference | Calibration Point | Span   | Units | Instrument Readings |       |       |
|--------------------------|--------------------------|-----------|-------------------|--------|-------|---------------------|-------|-------|
|                          |                          |           |                   |        |       | Before              | After | Units |
| Temperature              | Check Temp NATA          | Room Temp | 18.5              | -0.1   | °C    | NA                  | 18.4  | °C    |
| pH (21J)                 | pH 7.00                  | 375757    | 7.01              | -25.90 | mV    | 6.99                | 7.01  | pH    |
| pH (21J)                 | pH 4.00                  | 378281    | 4.00              | 145.70 | mV    | 3.99                | 4.00  | pH    |
| Conductivity (20A100065) | 2764 µS/cm at 25°C       | 21/1012   | 2764              | GLP    | 5.13  | 2757                | 2764  | µS/cm |
| ORP (200408SIA605101)    | Zobell A & B             | 22/0103   | 244               | 244    | mV    | 240.4               | 240.6 | mV    |
| Zero DO (20C100608)      | NaSO3 in distilled water | 10175     | 0.0               | NA     | NA    | 0.2                 | 0.0   | %     |
| 100% DO (20C100608)      | 100% Air Saturation      | Air       | 100.0             | 4.34   | uA    | 100.1               | 100.0 | %     |

Calibrated by: Gaurav Kanwar

Calibration Date: 17-Jun-22

Next Due: 14-Dec-22

| Date of Bump Test | Site ID | Unit Brand/ Model | Ambient Air Oxygen Calibration | Zero % Oxygen Solution Calibration | Standard Concentrations                                          | Ambient Temperature (°C) | Bump Test Reading                                            | Bump Test Readings within ±5%?                                                   | Comment | Test by (Name) | (Signature)        |
|-------------------|---------|-------------------|--------------------------------|------------------------------------|------------------------------------------------------------------|--------------------------|--------------------------------------------------------------|----------------------------------------------------------------------------------|---------|----------------|--------------------|
| 22/6/22           | 0960    | YSI # 20K104050   | 100% Saturation? Y N<br>NA     | 0% Calibration? Y N<br>NA          | pH 4.00 Y / N<br>pH 7.00 Y / N<br>EC: 1,413µS/cm Y / N<br>35,000 | 20.1                     | pH 4.00: 4.07<br>pH 7.00: 7.19<br>EC: 34780                  | pH 4.00: (± pH 0.2) Y / N<br>pH 7.00: (± pH 0.2) Y / N<br>EC: (± 150µS/cm) Y / N |         | Shawn Chambers | <i>[Signature]</i> |
| 22/6/22           | 0960    | YSI # 21B101799   | 100% Saturation? Y N<br>NA     | 0% Calibration? Y N<br>NA          | pH 4.00 Y / N<br>pH 7.00 Y / N<br>EC: 1,413µS/cm Y / N<br>35,000 | 20.3                     | pH 4.00: 4.08<br>pH 7.00: 6.97<br>EC: 33,800                 | pH 4.00: (± pH 0.2) Y / N<br>pH 7.00: (± pH 0.2) Y / N<br>EC: (± 150µS/cm) Y / N |         | Shawn Chambers | <i>[Signature]</i> |
| 22/6/22           | 0960    | YSI # 20D101040   | 100% Saturation? Y N<br>NA     | 0% Calibration? Y N<br>NA          | pH 4.00 Y / N<br>pH 7.00 Y / N<br>EC: 1,413µS/cm Y / N<br>35,000 | 20.5                     | pH 4.00: 4.09<br>pH 7.00: 7.00<br>EC: 34240                  | pH 4.00: (± pH 0.2) Y / N<br>pH 7.00: (± pH 0.2) Y / N<br>EC: (± 150µS/cm) Y / N |         | Shawn Chambers | <i>[Signature]</i> |
| 23/6/22           | 0960    | YSI # 20K104050   | 100% Saturation? Y N<br>N/A    | 0% Calibration? Y N<br>NA          | pH 4.00 Y / N<br>pH 7.00 Y / N<br>EC: 1,413µS/cm Y / N<br>35,000 | 20.2                     | pH 4.00: 4.19<br>pH 7.00: 7.05<br>Temp: 33.940<br>EC: 33,940 | pH 4.00: (± pH 0.2) Y / N<br>pH 7.00: (± pH 0.2) Y / N<br>EC: (± 150µS/cm) Y / N |         | Shawn Chambers | <i>[Signature]</i> |
| 23/6/22           | 0960    | YSI # 20D101040   | 100% Saturation? Y N<br>N/A    | 0% Calibration? Y N<br>NA          | pH 4.00 Y / N<br>pH 7.00 Y / N<br>EC: 1,413µS/cm Y / N<br>35,000 | 19.6                     | pH 4.00: 4.14<br>pH 7.00: 7.08<br>Temp: 34240<br>EC: 34240   | pH 4.00: (± pH 0.2) Y / N<br>pH 7.00: (± pH 0.2) Y / N<br>EC: (± 150µS/cm) Y / N |         | Shawn Chambers | <i>[Signature]</i> |
|                   |         | YSI #             | 100% Saturation? Y N           | 0% Calibration? Y N<br>NA          | pH 4.00 Y / N<br>pH 7.00 Y / N<br>EC: 1,413µS/cm Y / N           |                          | pH 4.00:<br>pH 7.00:<br>Temp:<br>EC:                         | pH 4.00: (± pH 0.2) Y / N<br>pH 7.00: (± pH 0.2) Y / N<br>EC: (± 150µS/cm) Y / N |         |                |                    |
|                   |         | YSI #             | 100% Saturation? Y N           | 0% Calibration? Y N<br>NA          | pH 4.00 Y / N<br>pH 7.00 Y / N<br>EC: 1,413µS/cm Y / N           |                          | pH 4.00:<br>pH 7.00:<br>Temp:<br>EC:                         | pH 4.00: (± pH 0.2) Y / N<br>pH 7.00: (± pH 0.2) Y / N<br>EC: (± 150µS/cm) Y / N |         |                |                    |
|                   |         | YSI #             | 100% Saturation? Y N           | 0% Calibration? Y N<br>NA          | pH 4.00 Y / N<br>pH 7.00 Y / N<br>EC: 1,413µS/cm Y / N           |                          | pH 4.00:<br>pH 7.00:<br>Temp:<br>EC:                         | pH 4.00: (± pH 0.2) Y / N<br>pH 7.00: (± pH 0.2) Y / N<br>EC: (± 150µS/cm) Y / N |         |                |                    |

APPENDIX

# E

DATA QUALITY REVIEW



now



## Data Quality Review PFAS Ongoing Monitoring Plan June 2022 Monitoring Event

This appendix reviews the Quality Assurance (QA) and Quality Control (QC) documentation. Quality assurance encompasses the actions, procedures, checks and decisions undertaken to ensure sample integrity and representativeness, and the reliability and accuracy of analysis results. The QA documentation should also include an indication of the Data Quality Objectives sought in relation to each significant action, test or process involved in the assessment.

QC activities measure the effectiveness of the QA procedures by undertaking testing, and then comparing results to previously established objectives. QC work will include the internal laboratory testing as well as results of QC samples submitted such as trip blanks and duplicates. The quality of the information and/or data is deemed satisfactory when the QC results demonstrate that agreed objectives have been met.

| QA/QC Aspects                                                     | Evidence & Evaluation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>QA Documentation</b>                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Project Quality Plan/Work Plan and Data Quality Objectives</b> | <p>The field investigation was carried out between the 22 and 23 June 2022 and is generally in accordance with the proposed scope of work, as documented in the SAQP (PFAS OMP SAQP RAAF Base Learmonth, Cardno, June 2022) issued to the client and in general compliance with Standards Australia 1998. AS/NZ 5667:1998 <i>Water quality – sampling</i>, NEPM “National Environment Protection (Assessment of Site Contamination) Measure” and PFAS NEMP 2.0.</p> <p>A quality control program was implemented during the Investigation and the quality assurance procedures used have been reiterated in the report (PFAS OMP June 2022 Factual Report). In addition, a safety, health and environment work method statement (SHEWMS) was also prepared.</p> <p>The Data Quality Objectives were expressed in terms of the purpose of the assessment and the relevant assessment criteria.</p> |
| <b>Data Representativeness</b>                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Use of Composites</b>                                          | No Composites were used during the investigation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Holding Times</b>                                              | <p>Chain of custody and laboratory reports provide evidence of holding times. Holding times were generally in compliance with required timeframes. The following holding time exceedance was reported:</p> <p>Alkalinity – 1 to 2 days overdue (EP2207728, EP2207731, EP2207732, EP2207737, EP2207739, EP2207812 &amp; EP2207816).</p> <p>The holding time exceedances for a minority of results are due to the remoteness of the site and the timing of the freight services. They are not considered to have adversely impacted the reliability of the results obtained, or the conclusions drawn from this assessment. Cardno ensures sample integrity by using overnight freight services where possible and keeping samples chilled with bagged ice.</p>                                                                                                                                     |
| <b>Verification of field procedures</b>                           | <p>The methodology conducted during this investigation is documented in the body of the report, and was in general conformance with the SAQP.</p> <p>Groundwater field parameters were taken from water collected from the hydraSleeves rather than placing the WQMs inside the wells to prevent risks of cross contamination of the monitoring wells.</p> <p>Non-disposable equipment was decontaminated between sample locations.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Laboratory Reports</b>                                         | <p>The following laboratory reports were considered for this data quality review:</p> <ul style="list-style-type: none"> <li>▪ ALS reports: EP2207727, EP2207728, EP2207729, EP2207731, EP2207732, EP2207733, EP2207737, EP2207738, EP2207739, EP2207810, EP2207812, EP2207813, EP2207814, EP2207815, EP2207816.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

## QA/QC Aspects

## Evidence & Evaluation

- Eurofins ARL report: 901145

### Data Precision & Accuracy

| QC sample Frequency | QC sample type     | SAQP required frequency       | Sample Collected                                                                                                  |
|---------------------|--------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------|
|                     | Blind duplicate    | 1 in 10 primary samples (10%) | 6 for 54 groundwater samples (11.1%)<br>2 in 26 surface water samples (7.69%)<br>5 in 49 sediment samples (10.2%) |
|                     | Interlab duplicate | 1 in 10 primary samples (10%) | 6 for 54 groundwater samples (11.1%)<br>2 in 26 surface water samples (7.69%)<br>5 in 49 sediment samples (10.2%) |
|                     | Rinsate            | 1 per field personnel per day | 5 for 2 days (2/3 field personnel) (100%)                                                                         |
|                     | Field Blank        | 1 per field personnel per day | 5 for 2 days (2/3 field personnel) (100%)                                                                         |

The required QC frequency was not achieved for surface water. However, a 10% overall frequency is achieved for water samples. This is considered to be a minor deviation with no impact on the data reliability.

## RPD Acceptance criteria

| Magnitude of Results | Acceptable RPD range |
|----------------------|----------------------|
| < 10 x LOR           | No limits            |
| 10 – 20 LOR          | 0% - 50%             |
| > 20 x LOR           | 0% - 20%             |

## QC Testing – Blind Duplicates (Primary Lab)

### Groundwater

- Primary Groundwater Samples Analysed: 54
- Blind Duplicate Samples Analysed: 6

All RPDs were within acceptance criteria with the following exception:

- QC115 (PFHxS – 100%, PFOS 103%).

### Surface water

- Primary surface water Samples Analysed: 26
- Blind Duplicate Samples Analysed: 2

All RPDs were within acceptance criteria.

### Sediment

- Primary Sediment Samples Analysed: 49
- Blind Duplicate Samples Analysed: 5

All RPDs were within acceptance criteria with the following exceptions:

- QC118 (Sum of PFOS and PFHxS – 21%)
- QC123 (PFOS – 66%)

## QC Testing – Interlab Duplicates (Secondary Lab)

### Groundwater

- Primary Groundwater Samples Analysed: 54
- Interlab Duplicate Samples Analysed: 6

All RPDs were within acceptance criteria with the following exceptions:

| QA/QC Aspects                 | Evidence & Evaluation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                               | <ul style="list-style-type: none"> <li>▪ QC215 (PFBS – 82%, PFPeS – 77%, PFPeA – 71%, PFHxA – 21%, PFHpA – 133%, PFOA – 158%).</li> <li>▪ QC217 (PFHxS – 85%, PFOS – 110%, PFBA – 22%, PFPeA – 63%, PFHxA – 79%, PFHpA – 93%, PFOA – 22%)</li> <li>▪ QC216 (PFBS – 160%, PFPeS – 162%, PFHxS – 165%, PFHpS – 179%, PFOS – 182%, PFBA – 198%, PFPeA – 169%, PFHxA – 163%, PFHxA – 170%, PFOA – 148%)</li> <li>▪ QC219 (PFHxS – 157%, PFHxA – 167%)</li> <li>▪ QC220 (PFBS – 149%, PFPeS – 164%, PFHxS – 162%, PFHpS – 24%, PFOS – 176%, PFPeA – 144%, PFHxA – 151%)</li> </ul> <p>These exceedances are likely due the difference of methodologies and detection levels between the primary and secondary laboratories and the low concentrations of analytes under review. In most cases the primary sample reported higher concentrations than the duplicate sample therefore the results reported on are considered conservative. This is not considered to have impacted the validity of the interpretation drawn upon this dataset.</p> <p><b>Surface water</b></p> <ul style="list-style-type: none"> <li>▪ Primary surface water Samples Analysed: 26</li> <li>▪ Interlab Duplicate Samples Analysed: 2</li> </ul> <p>All RPDs were within acceptance criteria with the following exceptions:</p> <ul style="list-style-type: none"> <li>▪ QC221 (PFOS – 69%) and QC226 (PFOS – 81%).</li> </ul> <p>These minor RPDs differences are likely due to the difference of methodologies between the primary and secondary laboratories and the low concentrations of analytes under review. In both cases, the results were of the same order of magnitude as the primary samples, which also reported higher concentrations than the duplicate samples. Therefore, the results reported on are considered conservative. This is not considered to have impacted the validity of the interpretation drawn upon this dataset.</p> <p><b>Sediment</b></p> <ul style="list-style-type: none"> <li>▪ Primary sediment Samples Analysed: 49</li> <li>▪ Interlab Duplicate Samples Analysed: 5</li> </ul> <p>All RPDs were within acceptance criteria with the following exceptions:</p> <ul style="list-style-type: none"> <li>▪ QC218 (PFOS 28%) and QC223 (PFOS – 83%)</li> </ul> <p>These minor RPDs differences are likely due to the difference of methodologies between the primary and secondary laboratories and the low concentrations of analytes under review. This is not considered to have impacted the reliability of the dataset.</p> |
| <b>Field Blanks</b>           | <p>Field Blanks were collected at a rate of one per fieldwork day. All field blank samples tested reported analytes below the laboratory limit of reporting.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Laboratory Internal QC</b> | <p>Evidence of the laboratories internal QC testing is present and complete in the reports. ALS (Primary) performed internal QC with adequate testing and satisfactory results for method blank, matrix spikes, laboratory control samples and laboratory duplicates.</p> <p>All Method Blank results were within acceptable range.</p> <p>All Matrix Spikes generally reported recoveries within the acceptance range of 70% to 130% with the exception of the following:</p> <ul style="list-style-type: none"> <li>▪ EP2207727, EP2207731, EP2207732, EP2207739, EP2207810, EP2207812, EP2207814, EP2207816: <ul style="list-style-type: none"> <li>- Samples ID: MW151, MW127, anonymous, SW210, MW178, OTH103: Sulfate and Chloride matrix spike recovery not determined due to the background concentrations exceeding 4x spike level.</li> </ul> </li> <li>▪ EP2207729, EP2207733: <ul style="list-style-type: none"> <li>- Samples ID: SS234, SS157, Anonymous: PFOS matrix spike recovery not determined due to the background concentrations exceeding 4x spike level.</li> </ul> </li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |



| QA/QC Aspects                                 | Evidence & Evaluation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                               | <p>The following quality control samples frequency outliers were reported:</p> <ul style="list-style-type: none"> <li>▪ EP2207727, EP2207728, EP2207737, EP2207739, EP2207810 <ul style="list-style-type: none"> <li>- Laboratory Duplicates: PFAS by LCMSMS, expected frequency of 10% not achieved.</li> </ul> </li> <li>▪ EP2207810 <ul style="list-style-type: none"> <li>- Matrix Spikes: PFAS by LCMSMS, expected frequency 5% not achieved.</li> </ul> </li> </ul> <p>The above outliers/exceptions are not considered to affect the reliability of the dataset.</p> |
| <b>Laboratory Method Detection Limit</b>      | <p>Laboratory reports indicate the method detection limits were generally lower than the respective assessment criteria.</p> <p>It was noted that the secondary laboratory applied a limit of reporting one order of magnitude lower than the primary laboratory for PFAS in water. This is not considered to have impacted the reliability of the data collected as part of this monitoring event. However, it could have contributed to a greater occurrence of RPD exceedances.</p>                                                                                      |
| <b>NATA endorsement of laboratory reports</b> | <p>Laboratory reports were stamped with the NATA endorsement stamp and signature.</p> <p>ALS Accreditation No. 825</p> <p>Eurofins ARL Accreditation No. 1261</p>                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Calibration of Field Equipment</b>         | <p>All equipment used during the investigation was calibrated by the supplier prior to use and daily readings of reference solutions (bump tests) were completed.</p> <p>The equipment calibration certificates and daily field bump test records are provided in Appendix D.</p>                                                                                                                                                                                                                                                                                           |
| <b>Decontamination and Equipment Blanks</b>   | <p>Rinsate blanks were collected at a rate of one per day per sampler when reusable equipment was used. All rinsate samples tested reported analytes concentrations below the laboratory LORs.</p>                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Data Comparability</b>                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Standard Procedures</b>                    | <p>Fieldwork procedures are detailed in the SAQP and reports and are comparable for each phase of Investigation.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Qualified Personnel</b>                    | <p>Staff involved in managing and reviewing the project and those involved in fieldwork are qualified personnel.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Sample Integrity</b>                       | <p>Field Chain of Custody/Laboratory request forms can be found in Appendix C.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Data Completeness</b>                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Completeness of test program</b>           | <p>The scope of work undertaken was generally consistent with the SAQP.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Validity of Data Set</b>                   | <p>The data quality review indicates no significant systematic errors in the data collection process and therefore, the data set used as the basis for groundwater, surface water, porewater and sediment investigation is considered valid and complete.</p>                                                                                                                                                                                                                                                                                                               |

APPENDIX

# D

DATA ASSESSMENT



now



|                                   |  |  | PFAS                  |                          |             |                                      |                                        |                                       |                                        |                                      |                                      |                               |                                 | PFAS - Perfluoroalkyl Carboxylic Acids |                                 |                               |                               |                               |                                   |                                   |                                     | PFAS - (n-2) Fluorotelomer Sulfonic Acids |                                           |                                           |                                           |                                             |                                   |                                              |
|-----------------------------------|--|--|-----------------------|--------------------------|-------------|--------------------------------------|----------------------------------------|---------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|-------------------------------|---------------------------------|----------------------------------------|---------------------------------|-------------------------------|-------------------------------|-------------------------------|-----------------------------------|-----------------------------------|-------------------------------------|-------------------------------------------|-------------------------------------------|-------------------------------------------|-------------------------------------------|---------------------------------------------|-----------------------------------|----------------------------------------------|
|                                   |  |  | Sum of PFHAs and PFOS | Sum of PFAS (WA DER Lix) | Sum of PFAS | Perfluorobutane sulfonic acid (PFBS) | Perfluoropentane sulfonic acid (PFHxS) | Perfluorohexane sulfonic acid (PFHxS) | Perfluoroheptane sulfonic acid (PFHxS) | Perfluorooctane sulfonic acid (PFOS) | Perfluorodecane sulfonic acid (PFDS) | Perfluorobutanoic acid (PFBA) | Perfluoropentanoic acid (PFPeA) | Perfluorohexanoic acid (PFHxA)         | Perfluoroheptanoic acid (PFHpA) | Perfluorooctanoic acid (PFOA) | Perfluorononanoic acid (PFNA) | Perfluorodecanoic acid (PFDA) | Perfluoroundecanoic acid (PFUnDA) | Perfluorododecanoic acid (PFDoDA) | Perfluorotridecanoic acid (PFTriDA) | Perfluorotetradecanoic acid (PFTeDA)      | 4:2 Fluorotelomer sulfonic acid (4:2 FTS) | 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | 10:2 Fluorotelomer sulfonic acid (10:2 FTS) | Perfluorooctane sulfonamide (FOA) | N-Methyl perfluorooctane sulfonamide (MeFOA) |
| LOR - Limit of Reporting          |  |  | 0.01                  | 0.01                     | 0.01        | 0.02                                 | 0.02                                   | 0.01                                  | 0.02                                   | 0.01                                 | 0.02                                 | 0.01                          | 0.02                            | 0.02                                   | 0.02                            | 0.01                          | 0.02                          | 0.02                          | 0.02                              | 0.02                              | 0.02                                | 0.05                                      | 0.05                                      | 0.05                                      | 0.05                                      | 0.05                                        | 0.02                              | 0.05                                         |
| PFAS NEMP 2020 Interim Marine 99% |  |  |                       |                          |             |                                      |                                        |                                       |                                        | 0.00023                              |                                      |                               |                                 |                                        |                                 | 19                            |                               |                               |                                   |                                   |                                     |                                           |                                           |                                           |                                           |                                             |                                   |                                              |
| PFAS NEMP 2020 Recreational Water |  |  | 2                     |                          |             |                                      |                                        |                                       |                                        |                                      |                                      |                               |                                 |                                        |                                 | 10                            |                               |                               |                                   |                                   |                                     |                                           |                                           |                                           |                                           |                                             |                                   |                                              |

| Monitoring Area | Location Code | Date | Field ID | Sample Type | Lab Report Number |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | </ |
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|               |        |            |                    | 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                                          |        |        |
| Source Area 1 | MW167  | 26/11/2019 | 0960_MW167_191126  | Normal                | EP1912481                  | 1.77        | 2.47                                   | 2.59                                   | 0.03                                  | 0.05                                   | 0.96                                 | 0.05                                 | 0.81                          | <0.02                           | <0.1                           | 0.12                            | 0.28                                      | 0.1                           | 0.17                          | 0.02                              | <0.02                             | <0.02                               | <0.02                                | <0.02                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.05                              | <0.02                                         | <0.05  |        |
|               |        | 25/06/2020 | 0960_MW167_200625  | Normal                | EP2006591                  | 2.02        | 2.79                                   | 2.93                                   | 0.04                                  | 0.06                                   | 1.08                                 | 0.06                                 | 0.94                          | <0.02                           | <0.1                           | 0.15                            | 0.28                                      | 0.12                          | 0.18                          | 0.02                              | <0.02                             | <0.02                               | <0.02                                | <0.02                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.05                              | <0.02                                         | <0.05  |        |
|               |        | 19/11/2020 | 0960_MW167_201119  | Normal                | EP2012917                  | 2.53        | 3.34                                   | 3.50                                   | 0.04                                  | 0.06                                   | 1.31                                 | 0.08                                 | 1.22                          | <0.02                           | <0.1                           | 0.16                            | 0.31                                      | 0.12                          | 0.18                          | 0.02                              | <0.02                             | <0.02                               | <0.02                                | <0.02                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.05                              | <0.02                                         | <0.05  |        |
|               |        | 23/06/2021 | 0960_MW167_210623  | Normal                | EP2107193                  | 1.78        | 2.32                                   | 2.43                                   | 0.04                                  | 0.06                                   | 0.97                                 | 0.05                                 | 0.81                          | <0.02                           | <0.1                           | 0.1                             | 0.21                                      | 0.07                          | 0.12                          | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.02                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.05                              | <0.02                                         | <0.05  |        |
|               |        | 24/11/2021 | 0960_MW167_211124  | Normal                | EP2114395                  | 2.58        | 3.45                                   | 3.59                                   | 0.07                                  | 0.08                                   | 1.50                                 | 0.06                                 | 1.08                          | <0.02                           | <0.1                           | 0.12                            | 0.4                                       | 0.11                          | 0.17                          | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.02                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.05                              | <0.02                                         | <0.05  |        |
|               |        | 22/06/2022 | 0960_MW167_220622  | Normal                | EP2207737                  | 2.07        | 2.69                                   | 2.80                                   | 0.04                                  | 0.06                                   | 1.03                                 | 0.05                                 | 1.04                          | <0.02                           | <0.1                           | 0.1                             | 0.24                                      | 0.1                           | 0.14                          | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.02                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.05                              | <0.02                                         | <0.05  |        |
| Source Area 1 | MW168  | 10/06/2018 | 0960_MW168_180610  | Normal                | 211878                     |             |                                        |                                        | 0.092                                 | 0.11                                   | 0.59                                 | 0.011                                | 0.062                         | <0.02                           | 0.026                          | 0.08                            | 0.3                                       | 0.03                          | 0.02                          | <0.001                            | <0.002                            | <0.002                              | <0.005                               | <0.01                                     | <0.05                                     | <0.001                                    | <0.001                                      | <0.001                             | <0.01                                         | <0.005 |        |
|               |        | 26/11/2019 | 0960_MW168_191126  | Normal                | EP1912481                  | 0.55        | 0.90                                   | 0.98                                   | 0.07                                  | 0.08                                   | 0.52                                 | <0.02                                | 0.03                          | <0.02                           | <0.1                           | 0.03                            | 0.21                                      | 0.02                          | 0.02                          | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.02                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.05                              | <0.02                                         | <0.05  |        |
|               |        | 25/06/2020 | 0960_MW168_200625  | Normal                | EP2006591                  | 0.59        | 0.99                                   | 1.07                                   | 0.08                                  | 0.08                                   | 0.54                                 | <0.02                                | 0.05                          | <0.02                           | <0.1                           | 0.06                            | 0.23                                      | 0.02                          | 0.01                          | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.02                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.05                              | <0.02                                         | <0.05  |        |
|               |        | 19/11/2020 | 0960_MW168_201119  | Normal                | EP2012917                  | 0.62        | 0.98                                   | 1.04                                   | 0.06                                  | 0.06                                   | 0.56                                 | <0.02                                | 0.06                          | <0.02                           | <0.1                           | 0.06                            | 0.23                                      | <0.02                         | 0.01                          | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.02                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.05                              | <0.02                                         | <0.05  |        |
|               |        | 23/06/2021 | 0960_MW168_210623  | Normal                | EP2107193                  | 0.86        | 1.26                                   | 1.35                                   | 0.08                                  | 0.09                                   | 0.76                                 | <0.02                                | 0.1                           | <0.02                           | <0.1                           | 0.06                            | 0.22                                      | 0.02                          | 0.02                          | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.02                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.05                              | <0.02                                         | <0.05  |        |
|               |        | 24/11/2021 | 0960_MW168_211124  | Normal                | EP2114395                  | 1.34        | 2.09                                   | 2.22                                   | 0.13                                  | 0.13                                   | 1.22                                 | <0.02                                | 0.12                          | <0.02                           | <0.1                           | 0.09                            | 0.45                                      | 0.04                          | 0.04                          | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.02                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.05                              | <0.02                                         | <0.05  |        |
| Source Area 1 | MW211  | 22/06/2022 | 0960_MW168_220622  | Normal                | EP2207737                  | 0.54        | 0.78                                   | 0.83                                   | 0.04                                  | 0.05                                   | 0.42                                 | <0.02                                | 0.12                          | <0.02                           | <0.1                           | 0.04                            | 0.12                                      | 0.02                          | 0.02                          | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.05                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.02                              | <0.05                                         |        |        |
|               |        | 9/03/2018  | 0960_MW168_180309  | Normal                | 208042                     | 8           |                                        |                                        |                                       | 0.12                                   | 0.17                                 | 1.8                                  | 0.12                          | 6.2                             | <0.02                          | 0.096                           | 0.12                                      | 0.44                          | 0.074                         | 0.15                              | 0.014                             | <0.002                              | <0.002                               | <0.005                                    | <0.01                                     | <0.05                                     | <0.001                                      | <0.001                             | <0.001                                        | <0.01  | <0.02  |
|               |        | 9/06/2018  | 0960_MW168_180609  | Normal                | 211878                     |             |                                        |                                        |                                       | 0.2                                    | 0.23                                 | 2.5                                  | 0.21                          | 3.8                             | <0.02                          | 0.11                            | 0.16                                      | 0.44                          | 0.091                         | 0.17                              | 0.008                             | <0.002                              | <0.002                               | <0.005                                    | <0.01                                     | <0.05                                     | <0.001                                      | <0.001                             | <0.001                                        | <0.01  | <0.005 |
|               |        | 26/11/2019 | 0960_MW168_191126  | Normal                | EP1912479                  | 5.65        | 6.70                                   | 7.04                                   | 0.17                                  | 0.24                                   | 2.23                                 | 0.10                                 | 3.42                          | <0.02                           | <0.1                           | 0.12                            | 0.52                                      | 0.06                          | 0.12                          | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.02                                     | <0.05                                     | <0.05                                     | 0.006                                       | <0.001                             | <0.001                                        | <0.02  | <0.005 |
|               |        | 24/06/2020 | 0960_MW211_200624  | Normal                | EP2006512                  | 5.4         | 6.41                                   | 6.78                                   | 0.23                                  | 0.26                                   | 2.31                                 | 0.11                                 | 3.09                          | <0.02                           | <0.1                           | 0.14                            | 0.47                                      | 0.06                          | 0.11                          | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.02                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.05                              | <0.02                                         | <0.05  |        |
|               |        | 19/11/2020 | 0960_MW211_201119  | Normal                | EP2012892                  | 5.92        | 7.02                                   | 7.39                                   | 0.18                                  | 0.28                                   | 2.65                                 | 0.09                                 | 3.27                          | <0.02                           | <0.1                           | 0.14                            | 0.62                                      | 0.06                          | 0.1                           | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.02                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.05                              | <0.02                                         | <0.05  |        |
| Source Area 1 | MW233  | 23/06/2021 | 0960_MW211_210623  | Normal                | EP2107193                  | 4.15        | 4.66                                   | 4.82                                   | 0.09                                  | 0.11                                   | 1.23                                 | 0.05                                 | 2.92                          | <0.02                           | <0.1                           | 0.08                            | 0.24                                      | 0.04                          | 0.06                          | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.02                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.05                              | <0.02                                         | <0.05  |        |
|               |        | 25/11/2021 | 0960_MW211_211125  | Normal                | EP2114474                  | 4.13        | 4.96                                   | 5.14                                   | 0.19                                  | 0.13                                   | 1.32                                 | 0.05                                 | 2.81                          | <0.02                           | <0.1                           | 0.12                            | 0.39                                      | 0.05                          | 0.08                          | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.02                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.05                              | <0.02                                         | <0.05  |        |
|               |        | 22/06/2022 | 0960_MW211_220622  | Normal                | EP2207737                  | 5.01        | 5.53                                   | 5.65                                   | 0.08                                  | 0.09                                   | 0.77                                 | 0.03                                 | 4.24                          | <0.02                           | <0.1                           | 0.1                             | 0.24                                      | 0.05                          | 0.05                          | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.02                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.05                              | <0.02                                         | <0.05  |        |
|               |        | 6/10/2015  | WA0043-MW63A       | Normal                | EP1514597                  |             |                                        |                                        |                                       |                                        |                                      |                                      |                               | 4.86                            |                                |                                 |                                           |                               |                               | 0.59                              |                                   |                                     |                                      |                                           |                                           |                                           | <0.1                                        | <0.1                               |                                               |        |        |
|               |        | 14/03/2016 | MW63_140316        | Normal                | EP1602253                  |             |                                        |                                        |                                       |                                        |                                      |                                      |                               | 6.7                             |                                |                                 |                                           |                               |                               | 0.71                              |                                   |                                     |                                      |                                           |                                           |                                           | <0.1                                        | <0.1                               |                                               |        |        |
|               |        | 2/12/2016  | MW063A             | Normal                | 527022                     |             |                                        |                                        |                                       |                                        |                                      |                                      |                               | 2.8                             |                                |                                 |                                           |                               |                               | 0.2                               |                                   |                                     |                                      |                                           |                                           |                                           | <0.05                                       | <0.05                              |                                               |        |        |
| Source Area 1 | MW159  | 6/03/2018  | 0960_MW063A_180306 | Normal                | 207817                     |             |                                        |                                        |                                       | 0.18                                   | 0.38                                 | 5.7                                  | 0.36                          | 1.4                             | <0.002                         | 0.081                           | 0.099                                     | 0.64                          | 0.16                          | 0.34                              | 0.005                             | <0.002                              | <0.002                               | <0.005                                    | <0.01                                     | <0.05                                     | <0.001                                      | <0.001                             | <0.001                                        | <0.01  | <0.005 |
|               |        | 10/06/2018 | 0960_MW063A_180610 | Normal                | 211878                     |             |                                        |                                        |                                       | 0.19                                   | 0.28                                 | 7.2                                  | 0.21                          | 1.4                             | <0.002                         | 0.063                           | 0.11                                      | 0.69                          | 0.13                          | 0.36                              | 0.006                             | <0.002                              | <0.002                               | <0.005                                    | <0.01                                     | <0.05                                     | <0.001                                      | <0.001                             | <0.001                                        | <0.01  | <0.005 |
|               |        | 26/11/2019 | 0960_MW063A_191126 | Normal                | EP1912479                  | 7.9         | 9.47                                   | 10.0                                   | 0.12                                  | 0.26                                   | 5.84                                 | 0.30                                 | 2.06                          | <0.02                           | <0.1                           | 0.07                            | 0.49                                      | 0.08                          | 0.6                           | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.02                                     | <0.05                                     | <0.05                                     | 0.21                                        | <0.05                              | <0.05                                         | <0.02  | <0.05  |
|               |        | 23/06/2021 | 0960_MW233_210623  | Normal                | EP2107193                  | 5.96        | 6.92                                   | 7.36                                   | 0.06                                  | 0.14                                   | 3.89                                 | 0.30                                 | 2.07                          | <0.02                           | <0.1                           | 0.05                            | 0.22                                      | 0.04                          | 0.59                          | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.02                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.05                              | <0.02                                         | <0.05  |        |
|               |        | 24/11/2021 | 0960_MW233_211124  | Normal                | EP2114395                  | 4.19        | 4.86                                   | 5.14                                   | 0.08                                  | 0.10                                   | 2.08                                 | 0.18                                 | 2.11                          | <0.02                           | <0.1                           | 0.05                            | 0.28                                      | 0.04                          | 0.22                          | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.02                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.05                              | <0.02                                         | <0.05  |        |
|               |        | 22/06/2022 | 0960_MW233_220622  | Normal                | EP2207731                  | 2.63        | 3.28                                   | 3.55                                   | 0.10                                  | 0.13                                   | 1.57                                 | 0.14                                 | 1.06                          | <0.02                           | <0.1                           | 0.11                            | 0.28                                      | 0.05                          | 0.11                          | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.02                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.05                              | <0.02                                         | <0.05  |        |
| Source Area 2 | MW105  | 15/06/2018 | 0960_MW159_180615  | Normal                | 212372                     | 0.02        |                                        |                                        | 0.001                                 | <0.001                                 | 0.008                                | <0.001                               | 0.017                         | <0.002                          | <0.002                         | <0.002                          | 0.001                                     | <0.001                        | <0.001                        | <0.002                            | <0.002                            | <0.005                              | <0.01                                | <0.05                                     | <0.001                                    | <0.001                                    | <0.001                                      | <0.001                             | <0.01                                         | <0.005 |        |
|               |        | 16/03/2020 | MW159_200316       | Normal                | EP2002956                  | <0.01       | <0.01                                  | <0.01                                  | <0.02                                 | <0.02                                  | <0.02                                | <0.02                                | <0.02                         | <0.02                           | <0.02                          | <0.02                           | <0.02                                     | <0.02                         | <0.02                         | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.05                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.02                              | <0.05                                         |        |        |
|               |        | 24/06/2020 | 0960_MW159_200624  | Normal                | EP2006515                  | 0.27        | 0.31                                   | 0.31                                   | <0.02                                 | <0.02                                  | 0.12                                 | <0.02                                | 0.15                          | <0.02                           | <0.1                           | <0.02                           | 0.03                                      | <0.02                         | 0.01                          | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.02                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.05                              | <0.02                                         | <0.05  |        |
|               |        | 20/11/2020 | 0960_MW159_201120  | Normal                | EP2012957                  | 0.02        | 0.02                                   | 0.02                                   | <0.02                                 | <0.02                                  | <0.02                                | <0.02                                | 0.02                          | <0.02                           | <0.1                           | <0.02                           | <0.02                                     | <0.02                         | <0.02                         | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.05                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.02                              | <0.05                                         |        |        |
|               |        | 23/06/2021 | 0960_MW159_210623  | Normal                | EP2107193                  | <0.01       | <0.01                                  | <0.01                                  | <0.02                                 | <0.02                                  | <0.02                                | <0.02                                | <0.01                         | <0.02                           | <0.1                           | <0.02                           | <0.02                                     | <0.02                         | <0.02                         | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.02                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.05                              | <0.02                                         | <0.05  |        |
|               |        | 25/11/2021 | 0960_MW159_211125  | Normal                | EP2114477                  | <0.01       | <0.01                                  | <0.01                                  | <0.02                                 | <0.02                                  | <0.02                                | <0.01                                | <0.02                         | <0.01                           | <0.02                          | <0.1                            | <0.02                                     | <0.02                         | <0.02                         | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.02                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.05                              | <0.02                                         | <0.05  |        |
| Source Area 2 | MW148D | 22/06/2022 | 0960_MW159_220622  | Normal                | EP2207727                  | <0.01       | <0.01                                  | <0.01                                  | <0.02                                 | <0.02                                  | <0.01                                | <0.02                                | <0.01                         | <0.02                           | <0.1                           | <0.02                           | <0.02                                     | <0.02                         | <0.02                         | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.05                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.02                              | <0.05                                         |        |        |
|               |        | 2/12/2019  | 0960_MW105_191202  | Normal                | EP1912747                  | 0.87        | 1.18                                   | 1.32                                   | 0.13                                  | 0.14                                   | 0.84                                 | <0.02                                | 0.03                          | <0.02                           | <0.1                           | 0.02                            | 0.16                                      | <0.02                         | <0.01                         | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.02                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.05                              | <0.02                                         | <0.05  |        |
|               |        | 25/06/2020 | 0960_MW105_200625  | Normal                |                            |             |                                        |                                        |                                       |                                        |                                      |                                      |                               |                                 |                                |                                 |                                           |                               |                               |                                   |                                   |                                     |                                      |                                           |                                           |                                           |                                             |                                    |                                               |        |        |



|                             |       |            |                   |        |           | PFAS                 |                           |             | PFAS - Perfluoroalkyl Carboxylic Acids |                                        |                                       |                                        |                                      |                                      |                               |                                  |                                      |                                     |                                           |                                           |                                           |                                             | PFAS - (n-2) Fluorotelomer Sulfonic Acids |                                               |         |        |        |        |         |        |        |
|-----------------------------|-------|------------|-------------------|--------|-----------|----------------------|---------------------------|-------------|----------------------------------------|----------------------------------------|---------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|-------------------------------|----------------------------------|--------------------------------------|-------------------------------------|-------------------------------------------|-------------------------------------------|-------------------------------------------|---------------------------------------------|-------------------------------------------|-----------------------------------------------|---------|--------|--------|--------|---------|--------|--------|
|                             |       |            |                   |        |           | Sum of PFAS and PPOS | Sum of PFAS (WA DER List) | Sum of PFAS | Perfluorobutane sulfonic acid (PFBS)   | Perfluoropentane sulfonic acid (PFPeS) | Perfluorohexane sulfonic acid (PFHxS) | Perfluoroheptane sulfonic acid (PFHpS) | Perfluorooctane sulfonic acid (PFOS) | Perfluorononane sulfonic acid (PFNS) | Perfluorodecanoic acid (PFDA) | Perfluorododecanoic acid (PFDDA) | Perfluorotetradecanoic acid (PFTrDA) | Perfluorohexadecanoic acid (PFHxDA) | 4:2 Fluorotelomer sulfonic acid (4:2 FTS) | 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | 10:2 Fluorotelomer sulfonic acid (10:2 FTS) | Perfluorooctane sulfonamide (FOSA)        | N-Methyl perfluorooctane sulfonamide (MeFOSA) |         |        |        |        |         |        |        |
|                             |       |            |                   |        |           | µg/L                 | µg/L                      | µg/L        | µg/L                                   | µg/L                                   | µg/L                                  | µg/L                                   | µg/L                                 | µg/L                                 | µg/L                          | µg/L                             | µg/L                                 | µg/L                                | µg/L                                      | µg/L                                      | µg/L                                      | µg/L                                        | µg/L                                      | µg/L                                          |         |        |        |        |         |        |        |
| On-site Pathway             | MW127 | 7/03/2018  | 0960_MW127_180307 | Normal | 207857    |                      |                           |             | <0.001                                 | <0.001                                 | <0.001                                | <0.001                                 | <0.001                               | <0.002                               | <0.002                        | <0.002                           | <0.001                               | <0.001                              | <0.001                                    | <0.001                                    | <0.002                                    | <0.002                                      | <0.005                                    | <0.01                                         | <0.05   | <0.001 | <0.001 | <0.001 | <0.001  | <0.01  | <0.005 |
|                             |       | 8/06/2018  | 0960_MW127_180608 | Normal | 211878    |                      |                           |             | <0.001                                 | <0.001                                 | <0.001                                | <0.001                                 | <0.001                               | <0.002                               | <0.002                        | <0.002                           | <0.001                               | <0.001                              | <0.001                                    | <0.001                                    | <0.002                                    | <0.002                                      | <0.005                                    | <0.01                                         | <0.05   | <0.001 | <0.001 | <0.001 | <0.001  | <0.01  | <0.005 |
|                             |       | 29/11/2019 | 0960_MW127_191129 | Normal | EP1912676 | <0.01                | <0.01                     | <0.01       | <0.02                                  | <0.02                                  | <0.02                                 | <0.02                                  | <0.01                                | <0.02                                | <0.1                          | <0.02                            | <0.02                                | <0.02                               | <0.02                                     | <0.02                                     | <0.02                                     | <0.02                                       | <0.02                                     | <0.05                                         | <0.05   | <0.05  | <0.05  | <0.05  | <0.02   | <0.05  |        |
|                             |       | 25/06/2020 | 0960_MW127_200625 | Normal | EP2006591 | <0.01                | <0.01                     | <0.01       | <0.02                                  | <0.02                                  | <0.02                                 | <0.02                                  | <0.02                                | <0.01                                | <0.02                         | <0.1                             | <0.02                                | <0.02                               | <0.02                                     | <0.02                                     | <0.02                                     | <0.02                                       | <0.02                                     | <0.02                                         | <0.05   | <0.05  | <0.05  | <0.05  | <0.05   | <0.02  | <0.05  |
|                             |       | 19/11/2020 | 0960_MW127_201119 | Normal | EP2012917 | <0.01                | <0.01                     | <0.01       | <0.02                                  | <0.02                                  | <0.02                                 | <0.02                                  | <0.02                                | <0.01                                | <0.02                         | <0.1                             | <0.02                                | <0.02                               | <0.02                                     | <0.02                                     | <0.02                                     | <0.02                                       | <0.02                                     | <0.02                                         | <0.05   | <0.05  | <0.05  | <0.05  | <0.05   | <0.02  | <0.05  |
|                             |       | 23/06/2021 | 0960_MW127_210623 | Normal | EP2107189 | <0.01                | <0.01                     | <0.01       | <0.02                                  | <0.02                                  | <0.02                                 | <0.02                                  | <0.02                                | <0.01                                | <0.02                         | <0.1                             | <0.02                                | <0.02                               | <0.02                                     | <0.02                                     | <0.02                                     | <0.02                                       | <0.02                                     | <0.02                                         | <0.05   | <0.05  | <0.05  | <0.05  | <0.05   | <0.02  | <0.05  |
|                             |       | 25/11/2021 | 0960_MW127_211125 | Normal | EP2114471 | <0.01                | <0.01                     | <0.01       | <0.02                                  | <0.02                                  | <0.01                                 | <0.02                                  | <0.01                                | <0.02                                | <0.1                          | <0.02                            | <0.02                                | <0.02                               | <0.02                                     | <0.02                                     | <0.02                                     | <0.02                                       | <0.02                                     | <0.02                                         | <0.05   | <0.05  | <0.05  | <0.05  | <0.05   | <0.02  | <0.05  |
| On-site Pathway             | MW170 | 22/06/2022 | 0960_MW127_220622 | Normal | EP2207731 | <0.01                | <0.01                     | <0.01       | <0.02                                  | <0.02                                  | <0.01                                 | <0.02                                  | <0.01                                | <0.02                                | <0.1                          | <0.02                            | <0.02                                | <0.02                               | <0.02                                     | <0.02                                     | <0.02                                     | <0.02                                       | <0.02                                     | <0.05                                         | <0.05   | <0.05  | <0.05  | <0.05  | <0.02   | <0.05  |        |
|                             |       | 18/06/2018 | 0960_MW170_180618 | Normal | 212372    | 0.17                 |                           |             | 0.020                                  | 0.028                                  | 0.17                                  | 0.002                                  | 0.004                                | <0.002                               | 0.006                         | 0.005                            | 0.009                                | 0.002                               | 0.001                                     | <0.001                                    | <0.002                                    | <0.002                                      | <0.005                                    | <0.01                                         | <0.05   | <0.001 | <0.001 | <0.001 | <0.001  | <0.01  | <0.005 |
|                             |       | 29/11/2019 | 0960_MW170_191129 | Normal | EP1912676 | 0.47                 | 0.57                      | 0.64        | 0.06                                   | 0.07                                   | 0.47                                  | <0.02                                  | <0.01                                | <0.02                                | <0.1                          | <0.02                            | 0.04                                 | <0.02                               | <0.01                                     | <0.02                                     | <0.02                                     | <0.02                                       | <0.02                                     | <0.02                                         | <0.05   | <0.05  | <0.05  | <0.05  | <0.05   | <0.02  | <0.05  |
|                             |       | 24/06/2020 | 0960_MW170_200624 | Normal | EP2006515 | 0.39                 | 0.47                      | 0.53        | 0.05                                   | 0.06                                   | 0.36                                  | <0.02                                  | 0.03                                 | <0.02                                | <0.1                          | <0.02                            | 0.03                                 | <0.02                               | <0.01                                     | <0.02                                     | <0.02                                     | <0.02                                       | <0.02                                     | <0.02                                         | <0.05   | <0.05  | <0.05  | <0.05  | <0.05   | <0.02  | <0.05  |
|                             |       | 19/11/2020 | 0960_MW170_201119 | Normal | EP2012894 | 0.39                 | 0.48                      | 0.54        | 0.05                                   | 0.06                                   | 0.39                                  | <0.02                                  | <0.01                                | <0.02                                | <0.1                          | <0.02                            | 0.04                                 | <0.02                               | <0.01                                     | <0.02                                     | <0.02                                     | <0.02                                       | <0.02                                     | <0.02                                         | <0.05   | <0.05  | <0.05  | <0.05  | <0.05   | <0.02  | <0.05  |
|                             |       | 23/06/2021 | 0960_MW170_210623 | Normal | EP2107189 | 0.27                 | 0.33                      | 0.37        | 0.04                                   | 0.04                                   | 0.27                                  | <0.02                                  | <0.01                                | <0.02                                | <0.1                          | <0.02                            | 0.02                                 | <0.02                               | <0.01                                     | <0.02                                     | <0.02                                     | <0.02                                       | <0.02                                     | <0.02                                         | <0.05   | <0.05  | <0.05  | <0.05  | <0.05   | <0.02  | <0.05  |
|                             |       | 23/11/2021 | 0960_MW170_211123 | Normal | EP2114467 | 0.437                | 0.597                     | 0.661       | 0.0654                                 | 0.0622                                 | 0.435                                 | 0.0022                                 | 0.0018                               | <0.0005                              | 0.027                         | 0.0207                           | 0.0401                               | 0.0046                              | 0.0021                                    | <0.0005                                   | <0.0005                                   | <0.0005                                     | <0.0005                                   | <0.0005                                       | <0.0005 | <0.001 | <0.001 | <0.001 | <0.0005 | <0.001 |        |
| On-site Pathway             | MW172 | 25/11/2021 | 0960_MW170_211125 | Normal | EP2114477 | 0.52                 | 0.67                      | 0.74        | 0.07                                   | 0.07                                   | 0.52                                  | <0.02                                  | <0.01                                | <0.02                                | <0.1                          | 0.02                             | 0.06                                 | <0.02                               | <0.01                                     | <0.02                                     | <0.02                                     | <0.02                                       | <0.02                                     | <0.05                                         | <0.05   | <0.05  | <0.05  | <0.05  | <0.02   | <0.05  |        |
|                             |       | 22/06/2022 | 0960_MW170_220622 | Normal | EP2207727 | 0.47                 | 0.61                      | 0.67        | 0.05                                   | 0.06                                   | 0.47                                  | <0.02                                  | <0.01                                | <0.02                                | <0.1                          | 0.03                             | 0.06                                 | <0.02                               | <0.01                                     | <0.02                                     | <0.02                                     | <0.02                                       | <0.02                                     | <0.05                                         | <0.05   | <0.05  | <0.05  | <0.05  | <0.02   | <0.05  |        |
|                             |       | 18/06/2018 | 0960_MW172_180618 | Normal | 212372    | 10                   |                           |             | 1.4                                    | 2.3                                    | 9.9                                   | 0.23                                   | 0.51                                 | <0.020                               | 0.36                          | 0.83                             | 3.6                                  | 0.41                                | 0.35                                      | <0.010                                    | <0.020                                    | <0.020                                      | <0.050                                    | <0.10                                         | <0.50   | <0.010 | 0.018  | <0.010 | <0.010  | <0.050 |        |
|                             |       | 29/11/2019 | 0960_MW172_191129 | Normal | EP1912676 | 45.4                 | 63.8                      | 70.8        | 2.59                                   | 5.78                                   | 42.0                                  | 1.29                                   | 3.38                                 | <0.02                                | 0.6                           | 1.62                             | 11.7                                 | 0.68                                | 1.12                                      | <0.02                                     | <0.02                                     | <0.02                                       | <0.02                                     | <0.02                                         | <0.05   | <0.05  | <0.05  | <0.05  | <0.05   | <0.02  | <0.05  |
|                             |       | 24/06/2020 | 0960_MW172_200624 | Normal | EP2006532 | 36.1                 | 52.1                      | 59.1        | 2.51                                   | 6.18                                   | 30.7                                  | 0.83                                   | 5.37                                 | <0.02                                | 0.6                           | 1.57                             | 9.19                                 | 0.96                                | 1.12                                      | <0.02                                     | <0.02                                     | <0.02                                       | <0.02                                     | <0.02                                         | <0.05   | <0.05  | <0.05  | <0.05  | <0.05   | <0.02  | <0.05  |
|                             |       | 19/11/2020 | 0960_MW172_201119 | Normal | EP2012894 | 28.3                 | 39.5                      | 43.7        | 1.27                                   | 3.40                                   | 22.8                                  | 0.86                                   | 5.46                                 | <0.02                                | 0.3                           | 1.02                             | 7.36                                 | 0.57                                | 0.7                                       | <0.02                                     | <0.02                                     | <0.02                                       | <0.02                                     | <0.02                                         | <0.05   | <0.05  | <0.05  | <0.05  | <0.05   | <0.02  | <0.05  |
|                             |       | 23/06/2021 | 0960_MW172_210623 | Normal | EP2107189 | 7.58                 | 12.2                      | 13.5        | 0.76                                   | 1.06                                   | 6.00                                  | 0.24                                   | 1.58                                 | <0.02                                | 0.2                           | 0.59                             | 2.27                                 | 0.36                                | 0.4                                       | <0.02                                     | <0.02                                     | <0.02                                       | <0.02                                     | <0.02                                         | <0.05   | <0.05  | <0.05  | <0.05  | <0.05   | <0.02  | <0.05  |
| Site Northern Drainage Chan | MW134 | 25/11/2021 | 0960_MW172_211125 | Normal | EP2114477 | 7.6                  | 12.5                      | 13.6        | 0.81                                   | 0.94                                   | 6.21                                  | 0.18                                   | 1.39                                 | <0.02                                | 0.2                           | 0.65                             | 2.49                                 | 0.35                                | 0.36                                      | <0.02                                     | <0.02                                     | <0.02                                       | <0.02                                     | <0.02                                         | <0.05   | <0.05  | <0.05  | <0.05  | <0.05   | <0.02  | <0.05  |
|                             |       | 22/06/2022 | 0960_MW172_220622 | Normal | EP2207727 | 6.3                  | 10.4                      | 11.4        | 0.61                                   | 0.83                                   | 5.08                                  | 0.16                                   | 1.22                                 | <0.02                                | 0.2                           | 0.58                             | 2.05                                 | 0.32                                | 0.3                                       | <0.02                                     | <0.02                                     | <0.02                                       | <0.02                                     | <0.02                                         | <0.05   | <0.05  | <0.05  | <0.05  | <0.05   | <0.02  | <0.05  |
|                             |       | 10/03/2018 | 0960_MW134_180310 | Normal | 208042    | <0.001               |                           |             | 0.002                                  | <0.0                                   |                                       |                                        |                                      |                                      |                               |                                  |                                      |                                     |                                           |                                           |                                           |                                             |                                           |                                               |         |        |        |        |         |        |        |

[illegible]

[illegible]



|                           |       |            |                   |        |           | PFAS                  |                           |             | PFAS - Perfluoroalkyl Carboxylic Acids |                                        |                                       |                                        |                                      |                                      |                               |                                 |                                |                                 |                               |                               | PFAS - (n:2) Fluorotelomer Sulfonic Acids |                                   |                                   |                                     |                                      |                                           |                                           |                                           |                                             |                                    |                                               |        |
|---------------------------|-------|------------|-------------------|--------|-----------|-----------------------|---------------------------|-------------|----------------------------------------|----------------------------------------|---------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|-------------------------------|---------------------------------|--------------------------------|---------------------------------|-------------------------------|-------------------------------|-------------------------------------------|-----------------------------------|-----------------------------------|-------------------------------------|--------------------------------------|-------------------------------------------|-------------------------------------------|-------------------------------------------|---------------------------------------------|------------------------------------|-----------------------------------------------|--------|
|                           |       |            |                   |        |           | Sum of PFHAs and PFOS | Sum of PFAS (WA DER List) | Sum of PFAS | Perfluorobutane sulfonic acid (PFBS)   | Perfluoropentane sulfonic acid (PFPeS) | Perfluorohexane sulfonic acid (PFHxS) | Perfluoroheptane sulfonic acid (PFHpS) | Perfluorooctane sulfonic acid (PFOS) | Perfluorodecane sulfonic acid (PFDS) | Perfluorobutanoic acid (PFBA) | Perfluoropentanoic acid (PFPeA) | Perfluorohexanoic acid (PFHxA) | Perfluoroheptanoic acid (PFHpA) | Perfluorooctanoic acid (PFOA) | Perfluorononanoic acid (PFNA) | Perfluorodecanoic acid (PFDA)             | Perfluoroundecanoic acid (PFUnDA) | Perfluorododecanoic acid (PFDoDA) | Perfluorotridecanoic acid (PFTriDA) | Perfluorotetradecanoic acid (PFTeDA) | 4:2 Fluorotelomer sulfonic acid (4:2 FTS) | 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | 10:2 Fluorotelomer sulfonic acid (10:2 FTS) | Perfluorooctane sulfonamide (FOSA) | N-Methyl perfluorooctane sulfonamide (MeFOSA) |        |
|                           |       |            |                   |        |           | µg/L                  | µg/L                      | µg/L        | µg/L                                   | µg/L                                   | µg/L                                  | µg/L                                   | µg/L                                 | µg/L                                 | µg/L                          | µg/L                            | µg/L                           | µg/L                            | µg/L                          | µg/L                          | µg/L                                      | µg/L                              | µg/L                              | µg/L                                | µg/L                                 | µg/L                                      | µg/L                                      | µg/L                                      | µg/L                                        | µg/L                               | µg/L                                          |        |
| Northern Drainage Channel | SW192 | 17/05/2022 | 0960_SW190_220517 | Normal | EP2205925 | 0.27                  | 0.27                      | 0.27        | <0.02                                  | <0.02                                  | 0.01                                  | <0.02                                  | 0.26                                 | <0.02                                | <0.1                          | <0.02                           | <0.02                          | <0.02                           | <0.01                         | <0.02                         | <0.02                                     | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.05                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.02                              | <0.05                                         |        |
|                           |       | 23/06/2022 | 0960_SW190_220623 | Normal | EP2207812 | 0.22                  | 0.22                      | 0.22        | <0.02                                  | <0.02                                  | 0.02                                  | <0.02                                  | 0.20                                 | <0.02                                | <0.1                          | <0.02                           | <0.02                          | <0.02                           | <0.01                         | <0.02                         | <0.02                                     | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.05                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.02                              | <0.05                                         |        |
|                           |       | 18/05/2022 | 0960_SW192_220518 | Normal | EP2205970 | 0.07                  | 0.07                      | 0.07        | <0.02                                  | <0.02                                  | <0.01                                 | <0.02                                  | 0.07                                 | <0.02                                | <0.1                          | <0.02                           | <0.02                          | <0.02                           | <0.01                         | <0.02                         | <0.02                                     | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.05                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.02                              | <0.05                                         |        |
| Northern Drainage Channel | SW193 | 23/06/2022 | 0960_SW192_220623 | Normal | EP2207816 | 0.18                  | 0.18                      | 0.18        | <0.02                                  | <0.02                                  | 0.02                                  | <0.02                                  | 0.16                                 | <0.02                                | <0.1                          | <0.02                           | <0.02                          | <0.02                           | <0.01                         | <0.02                         | <0.02                                     | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.05                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.02                              | <0.05                                         |        |
|                           |       | 28/05/2020 | 0960_SW193_200528 | Normal | EP2005558 | 0.03                  | 0.03                      | 0.03        | <0.02                                  | <0.02                                  | <0.02                                 | <0.02                                  | 0.03                                 | <0.02                                | <0.1                          | <0.02                           | <0.02                          | <0.02                           | <0.01                         | <0.02                         | <0.02                                     | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.05                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.02                              | <0.05                                         |        |
|                           |       | 25/06/2020 | 0960_SW193_200625 | Normal | EP2006596 | 0.03                  | 0.03                      | 0.03        | <0.02                                  | <0.02                                  | <0.02                                 | <0.02                                  | 0.03                                 | <0.02                                | <0.1                          | <0.02                           | <0.02                          | <0.02                           | <0.01                         | <0.02                         | <0.02                                     | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.05                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.02                              | <0.05                                         |        |
| Northern Drainage Channel | SW193 | 4/03/2021  | 0960_SW193_210304 | Normal | EP2102258 | 0.26                  | 0.26                      | 0.26        | <0.02                                  | <0.02                                  | <0.02                                 | <0.02                                  | 0.26                                 | <0.02                                | <0.1                          | <0.02                           | <0.02                          | <0.02                           | <0.01                         | <0.02                         | <0.02                                     | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.05                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.02                              | <0.05                                         |        |
|                           |       | 23/06/2021 | 0960_SW193_210623 | Normal | EP2107270 | <0.01                 | <0.01                     | <0.01       | <0.02                                  | <0.02                                  | <0.02                                 | <0.02                                  | <0.01                                | <0.02                                | <0.1                          | <0.02                           | <0.02                          | <0.02                           | <0.01                         | <0.02                         | <0.02                                     | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.05                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.02                              | <0.05                                         |        |
|                           |       | 18/05/2022 | 0960_SW193_220518 | Normal | EP2205970 | 0.08                  | 0.08                      | 0.08        | <0.02                                  | <0.02                                  | <0.01                                 | <0.02                                  | 0.08                                 | <0.02                                | <0.1                          | <0.02                           | <0.02                          | <0.02                           | <0.01                         | <0.02                         | <0.02                                     | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.05                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.02                              | <0.05                                         |        |
| Southern Drainage Channel | SW199 | 23/06/2022 | 0960_SW193_220623 | Normal | EP2207816 | 0.19                  | 0.19                      | 0.19        | <0.02                                  | <0.02                                  | 0.01                                  | <0.02                                  | 0.18                                 | <0.02                                | <0.1                          | <0.02                           | <0.02                          | <0.02                           | <0.01                         | <0.02                         | <0.02                                     | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.05                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.02                              | <0.05                                         |        |
|                           |       | 26/05/2020 | 0960_SW199_200526 | Normal | EP2005408 | 0.04                  | 0.04                      | 0.04        | <0.02                                  | <0.02                                  | <0.02                                 | <0.02                                  | 0.04                                 | <0.02                                | <0.1                          | <0.02                           | <0.02                          | <0.02                           | <0.01                         | <0.02                         | <0.02                                     | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.05                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.02                              | <0.05                                         |        |
|                           |       | 4/03/2021  | 0960_SW199_210304 | Normal | EP2102262 | <0.01                 | <0.01                     | <0.01       | <0.02                                  | <0.02                                  | <0.02                                 | <0.02                                  | <0.01                                | <0.02                                | <0.1                          | <0.02                           | <0.02                          | <0.02                           | <0.01                         | <0.02                         | <0.02                                     | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.05                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.02                              | <0.05                                         |        |
| Southern Drainage Channel | SW200 | 22/06/2022 | 0960_SW199_220622 | Normal | EP2207732 | <0.01                 | <0.01                     | <0.01       | <0.02                                  | <0.02                                  | <0.01                                 | <0.02                                  | <0.01                                | <0.02                                | <0.1                          | <0.02                           | <0.02                          | <0.02                           | <0.01                         | <0.02                         | <0.02                                     | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.05                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.02                              | <0.05                                         |        |
|                           |       | 19/02/2018 | 0960_SW200_180219 | Normal | 207115    |                       |                           |             | <0.001                                 | <0.001                                 | <0.001                                | <0.001                                 | <0.001                               | <0.002                               | <0.002                        | <0.002                          | 0.006                          | <0.001                          | <0.001                        | <0.001                        | <0.001                                    | <0.002                            | <0.002                            | <0.005                              | <0.01                                | <0.05                                     | <0.001                                    | <0.001                                    | <0.001                                      | <0.001                             | <0.01                                         | <0.005 |
|                           |       | 4/03/2021  | 0960_SW200_210304 | Normal | EP2102262 | <0.01                 | <0.01                     | <0.01       | <0.02                                  | <0.02                                  | <0.02                                 | <0.02                                  | <0.01                                | <0.02                                | <0.1                          | <0.02                           | <0.02                          | <0.02                           | <0.01                         | <0.02                         | <0.02                                     | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.05                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.02                              | <0.05                                         |        |
| Southern Drainage Channel | SW200 | 24/06/2021 | 0960_SW200_210624 | Normal | EP2107281 | <0.01                 | <0.01                     | <0.01       | <0.02                                  | <0.02                                  | <0.02                                 | <0.02                                  | <0.01                                | <0.02                                | <0.1                          | <0.02                           | <0.02                          | <0.02                           | <0.01                         | <0.02                         | <0.02                                     | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.05                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.02                              | <0.05                                         |        |
|                           |       | 22/06/2022 | 0960_SW200_220622 | Normal | EP2207732 | <0.01                 | <0.01                     | <0.01       | <0.02                                  | <0.02                                  | <0.01                                 | <0.02                                  | <0.01                                | <0.02                                | <0.1                          | <0.02                           | <0.02                          | <0.02                           | <0.01                         | <0.02                         | <0.02                                     | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.05                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.02                              | <0.05                                         |        |
|                           |       | 19/02/2018 | 0960_SW205_180219 | Normal | 207115    |                       |                           |             | <0.001                                 | <0.001                                 | <0.001                                | <0.001                                 | <0.001                               | <0.002                               | <0.002                        | <0.002                          | <0.001                         | <0.001                          | <0.001                        | <0.001                        | <0.001                                    | <0.002                            | <0.002                            | <0.005                              | <0.01                                | <0.05                                     | <0.001                                    | <0.001                                    | <0.001                                      | <0.001                             | <0.01                                         | <0.005 |
| WAPET Creek south         | SW205 | 14/06/2018 | 0960_SW205_180614 | Normal | 212372    | <0.001                |                           |             | <0.001                                 | <0.001                                 | <0.001                                | <0.001                                 | <0.001                               | <0.002                               | <0.002                        | <0.002                          | <0.001                         | <0.001                          | <0.001                        | <0.001                        | <0.002                                    | <0.002                            | <0.002                            | <0.005                              | <0.01                                | <0.05                                     | <0.001                                    | 0.004                                     | <0.001                                      | <0.001                             | <0.01                                         | <0.005 |
|                           |       | 27/05/2020 | 0960_SW205_200527 | Normal | EP2005487 | <0.01                 | <0.01                     | <0.01       | <0.02                                  | <0.02                                  | <0.02                                 | <0.02                                  | <0.01                                | <0.02                                | <0.1                          | <0.02                           | <0.02                          | <0.02                           | <0.01                         | <0.02                         | <0.02                                     | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.05                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.02                              | <0.05                                         |        |
|                           |       | 24/06/2020 | 0960_SW205_200624 | Normal | EP2006551 | <0.01                 | <0.01                     | <0.01       | <0.02                                  | <0.02                                  | <0.02                                 | <0.02                                  | <0.01                                | <0.02                                | <0.1                          | <0.02                           | <0.02                          | <0.02                           | <0.01                         | <0.02                         | <0.02                                     | <0.02                             | <0.02                             | <0.02                               | <0.02                                | <0.05                                     | <0.05                                     | <0.05                                     | <0.05                                       | <0.02                              | <0.05                                         |        |
| WAPET Creek south         | SW205 | 20/11/2020 | 0960_SW205_201120 | Normal | EP2013114 | <0.01                 | <0.01                     | <0.01       | <0.02                                  | <0.02                                  | <0.02                                 | <0.02                                  | <0.01                                | <0.02                                | <0.1                          |                                 |                                |                                 |                               |                               |                                           |                                   |                                   |                                     |                                      |                                           |                                           |                                           |                                             |                                    |                                               |        |

|                   |                   |            |                   |        |           | PFAS                          |                                   |                     | PFAS - Perfluoroalkyl Carboxylic Acids       |                                                |                                               |                                                |                                              |                                              |                                       |                                         |                                        |                                         |                                       |                                       |                                       | PFAS - (n:2) Fluorotelomer Sulfonic Acids |                                           |                                            |                                              |                                                   |                                                   |                                                   |                                                     |                                            |                                                       |
|-------------------|-------------------|------------|-------------------|--------|-----------|-------------------------------|-----------------------------------|---------------------|----------------------------------------------|------------------------------------------------|-----------------------------------------------|------------------------------------------------|----------------------------------------------|----------------------------------------------|---------------------------------------|-----------------------------------------|----------------------------------------|-----------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|-------------------------------------------|-------------------------------------------|--------------------------------------------|----------------------------------------------|---------------------------------------------------|---------------------------------------------------|---------------------------------------------------|-----------------------------------------------------|--------------------------------------------|-------------------------------------------------------|
|                   |                   |            |                   |        |           | Sum of PFASs and PFOS<br>µg/L | Sum of PFAS (WA DER List)<br>µg/L | Sum of PFAS<br>µg/L | Perfluorobutane sulfonic acid (PFBS)<br>µg/L | Perfluoropentane sulfonic acid (PFPeS)<br>µg/L | Perfluorohexane sulfonic acid (PFHxS)<br>µg/L | Perfluoroheptane sulfonic acid (PFHpS)<br>µg/L | Perfluorooctane sulfonic acid (PFOS)<br>µg/L | Perfluorodecane sulfonic acid (PFDS)<br>µg/L | Perfluorobutanoic acid (PFBA)<br>µg/L | Perfluoropentanoic acid (PFPeA)<br>µg/L | Perfluorohexanoic acid (PFHxA)<br>µg/L | Perfluoroheptanoic acid (PFHpA)<br>µg/L | Perfluorooctanoic acid (PFOA)<br>µg/L | Perfluorononanoic acid (PFNA)<br>µg/L | Perfluorodecanoic acid (PFDA)<br>µg/L | Perfluoroundecanoic acid (PFUnDA)<br>µg/L | Perfluorododecanoic acid (PFDoDA)<br>µg/L | Perfluorotridecanoic acid (PFTrDA)<br>µg/L | Perfluorotetradecanoic acid (PFTeDA)<br>µg/L | 4:2 Fluorotelomer sulfonic acid (4:2 FTS)<br>µg/L | 6:2 Fluorotelomer sulfonic acid (6:2 FTS)<br>µg/L | 8:2 Fluorotelomer sulfonic acid (8:2 FTS)<br>µg/L | 10:2 Fluorotelomer sulfonic acid (10:2 FTS)<br>µg/L | Perfluorooctane sulfonamide (FOSA)<br>µg/L | N-Methyl perfluorooctane sulfonamide (MeFOSA)<br>µg/L |
|                   |                   | 23/06/2021 | 0960_SW300_210623 | Normal | EP2107270 | 0.02                          | 0.02                              | 0.02                | <0.02                                        | <0.02                                          | <0.02                                         | <0.02                                          | 0.02                                         | <0.02                                        | <0.1                                  | <0.02                                   | <0.02                                  | <0.02                                   | <0.02                                 | <0.02                                 | <0.02                                 | <0.02                                     | <0.05                                     | <0.05                                      | <0.05                                        | <0.05                                             | <0.02                                             | <0.05                                             |                                                     |                                            |                                                       |
|                   |                   | 24/11/2021 | 0960_SW300_211124 | Normal | EP2114398 | <0.01                         | <0.01                             | <0.01               | <0.02                                        | <0.02                                          | <0.01                                         | <0.02                                          | <0.02                                        | <0.02                                        | <0.1                                  | <0.02                                   | <0.02                                  | <0.02                                   | <0.02                                 | <0.02                                 | <0.02                                 | <0.02                                     | <0.05                                     | <0.05                                      | <0.05                                        | <0.05                                             | <0.02                                             | <0.05                                             |                                                     |                                            |                                                       |
|                   |                   | 18/05/2022 | 0960_SW300_220518 | Normal | EP2205970 | <0.01                         | <0.01                             | <0.01               | <0.02                                        | <0.02                                          | <0.01                                         | <0.02                                          | <0.02                                        | <0.02                                        | <0.1                                  | <0.02                                   | <0.02                                  | <0.02                                   | <0.02                                 | <0.02                                 | <0.02                                 | <0.02                                     | <0.05                                     | <0.05                                      | <0.05                                        | <0.05                                             | <0.02                                             | <0.05                                             |                                                     |                                            |                                                       |
|                   |                   | 23/06/2022 | 0960_SW300_220623 | Normal | EP2207816 | 0.02                          | 0.02                              | 0.02                | <0.02                                        | <0.02                                          | <0.01                                         | <0.02                                          | 0.02                                         | <0.02                                        | <0.1                                  | <0.02                                   | <0.02                                  | <0.02                                   | <0.02                                 | <0.02                                 | <0.02                                 | <0.02                                     | <0.05                                     | <0.05                                      | <0.05                                        | <0.05                                             | <0.02                                             | <0.05                                             |                                                     |                                            |                                                       |
|                   |                   | 20/06/2018 | 0960_SW301_180620 | Normal | 212572    | 0.034                         | <0.01                             | <0.01               | <0.01                                        | <0.01                                          | <0.01                                         | <0.01                                          | 0.034                                        | <0.02                                        | <0.02                                 | <0.02                                   | <0.01                                  | <0.01                                   | <0.02                                 | <0.02                                 | <0.05                                 | <0.01                                     | <0.01                                     | <0.01                                      | <0.01                                        | <0.01                                             | <0.05                                             |                                                   |                                                     |                                            |                                                       |
|                   |                   | 24/06/2021 | 0960_SW301_210624 | Normal | EP2107278 | <0.01                         | <0.01                             | <0.01               | <0.02                                        | <0.02                                          | <0.02                                         | <0.02                                          | <0.02                                        | <0.02                                        | <0.1                                  | <0.02                                   | <0.02                                  | <0.02                                   | <0.02                                 | <0.02                                 | <0.02                                 | <0.02                                     | <0.02                                     | <0.05                                      | <0.05                                        | <0.05                                             | <0.05                                             | <0.02                                             | <0.05                                               |                                            |                                                       |
| WAPET creek north | SW301             | 25/11/2021 | 0960_SW301_211125 | Normal | EP2114473 | <0.01                         | <0.01                             | <0.01               | <0.02                                        | <0.02                                          | <0.01                                         | <0.02                                          | <0.02                                        | <0.1                                         | <0.02                                 | <0.02                                   | <0.02                                  | <0.02                                   | <0.02                                 | <0.02                                 | <0.02                                 | <0.02                                     | <0.05                                     | <0.05                                      | <0.05                                        | <0.05                                             | <0.02                                             | <0.05                                             |                                                     |                                            |                                                       |
|                   |                   | 17/05/2022 | 0960_SW301_220517 | Normal | EP2205925 | <0.01                         | <0.01                             | <0.01               | <0.02                                        | <0.02                                          | <0.01                                         | <0.02                                          | <0.02                                        | <0.02                                        | <0.1                                  | <0.02                                   | <0.02                                  | <0.02                                   | <0.02                                 | <0.02                                 | <0.02                                 | <0.02                                     | <0.05                                     | <0.05                                      | <0.05                                        | <0.05                                             | <0.02                                             | <0.05                                             |                                                     |                                            |                                                       |
|                   |                   | 23/06/2022 | 0960_SW301_220623 | Normal | EP2207812 | <0.01                         | <0.01                             | <0.01               | <0.02                                        | <0.02                                          | <0.01                                         | <0.02                                          | <0.02                                        | <0.1                                         | <0.02                                 | <0.02                                   | <0.02                                  | <0.02                                   | <0.02                                 | <0.02                                 | <0.02                                 | <0.02                                     | <0.05                                     | <0.05                                      | <0.05                                        | <0.05                                             | <0.02                                             | <0.05                                             |                                                     |                                            |                                                       |
|                   |                   | 20/06/2018 | 0960_SW302_180620 | Normal | 212572    | 0.22                          | <0.01                             | <0.01               | <0.01                                        | <0.01                                          | 0.002                                         | <0.01                                          | 0.22                                         | 0.003                                        | <0.02                                 | 0.002                                   | <0.01                                  | <0.01                                   | <0.01                                 | <0.01                                 | <0.02                                 | <0.05                                     | <0.01                                     | <0.01                                      | <0.01                                        | <0.01                                             | <0.01                                             | <0.05                                             |                                                     |                                            |                                                       |
|                   |                   | 2/12/2019  | 0960_SW302_191202 | Normal | EP1912743 | <0.01                         | <0.01                             | <0.01               | <0.02                                        | <0.02                                          | <0.02                                         | <0.02                                          | <0.01                                        | <0.02                                        | <0.1                                  | <0.02                                   | <0.02                                  | <0.02                                   | <0.02                                 | <0.02                                 | <0.02                                 | <0.02                                     | <0.05                                     | <0.05                                      | <0.05                                        | <0.05                                             | <0.02                                             | <0.05                                             |                                                     |                                            |                                                       |
|                   |                   | 26/05/2020 | 0960_SW302_200526 | Normal | EP2005408 | <0.01                         | <0.01                             | <0.01               | <0.02                                        | <0.02                                          | <0.02                                         | <0.02                                          | <0.01                                        | <0.02                                        | <0.1                                  | <0.02                                   | <0.02                                  | <0.02                                   | <0.02                                 | <0.02                                 | <0.02                                 | <0.02                                     | <0.05                                     | <0.05                                      | <0.05                                        | <0.05                                             | <0.02                                             | <0.05                                             |                                                     |                                            |                                                       |
| WAPET creek north | SW302             | 24/06/2020 | 0960_SW302_200624 | Normal | EP2006531 | <0.01                         | <0.01                             | <0.01               | <0.02                                        | <0.02                                          | <0.02                                         | <0.02                                          | <0.01                                        | <0.02                                        | <0.1                                  | <0.02                                   | <0.02                                  | <0.02                                   | <0.02                                 | <0.02                                 | <0.02                                 | <0.05                                     | <0.05                                     | <0.05                                      | <0.05                                        | <0.02                                             | <0.05                                             |                                                   |                                                     |                                            |                                                       |
|                   |                   | 20/11/2020 | 0960_SW302_201120 | Normal | EP2012947 | <0.01                         | <0.01                             | <0.01               | <0.02                                        | <0.02                                          | <0.02                                         | <0.02                                          | <0.01                                        | <0.02                                        | <0.1                                  | <0.02                                   | <0.02                                  | <0.02                                   | <0.02                                 | <0.02                                 | <0.02                                 | <0.05                                     | <0.05                                     | <0.05                                      | <0.05                                        | <0.02                                             | <0.05                                             |                                                   |                                                     |                                            |                                                       |
|                   |                   | 4/03/2021  | 0960_SW302_210304 | Normal | EP2102258 | <0.01                         | <0.01                             | <0.01               | <0.02                                        | <0.02                                          | <0.02                                         | <0.02                                          | <0.01                                        | <0.02                                        | <0.1                                  | <0.02                                   | <0.02                                  | <0.02                                   | <0.02                                 | <0.02                                 | <0.02                                 | <0.05                                     | <0.05                                     | <0.05                                      | <0.05                                        | <0.02                                             | <0.05                                             |                                                   |                                                     |                                            |                                                       |
|                   |                   | 24/06/2021 | 0960_SW302_210624 | Normal | EP2107274 | <0.01                         | <0.01                             | <0.01               | <0.02                                        | <0.02                                          | <0.02                                         | <0.02                                          | <0.01                                        | <0.02                                        | <0.1                                  | <0.02                                   | <0.02                                  | <0.02                                   | <0.02                                 | <0.02                                 | <0.02                                 | <0.02                                     | <0.05                                     | <0.05                                      | <0.05                                        | <0.05                                             | <0.02                                             | <0.05                                             |                                                     |                                            |                                                       |
|                   |                   | 24/11/2021 | 0960_SW302_211124 | Normal | EP2114399 | <0.01                         | <0.01                             | <0.01               | <0.02                                        | <0.02                                          | <0.02                                         | <0.02                                          | <0.01                                        | <0.02                                        | <0.1                                  | <0.02                                   | <0.02                                  | <0.02                                   | <0.02                                 | <0.02                                 | <0.02                                 | <0.02                                     | <0.05                                     | <0.05                                      | <0.05                                        | <0.05                                             | <0.02                                             | <0.05                                             |                                                     |                                            |                                                       |
|                   |                   | 18/05/2022 | 0960_SW302_220518 | Normal | EP2205970 | <0.01                         | <0.01                             | <0.01               | <0.02                                        | <0.02                                          | <0.01                                         | <0.02                                          | <0.01                                        | <0.02                                        | <0.1                                  | <0.02                                   | <0.02                                  | <0.02                                   | <0.02                                 | <0.02                                 | <0.02                                 | <0.02                                     | <0.05                                     | <0.05                                      | <0.05                                        | <0.05                                             | <0.02                                             | <0.05                                             |                                                     |                                            |                                                       |
| 23/06/2022        | 0960_SW302_220622 | Normal     | EP2207739         | 0.02   | 0.02      | 0.02                          | <0.02                             | <0.02               | <0.01                                        | <0.02                                          | 0.02                                          | <0.02                                          | <0.1                                         | <0.02                                        | <0.02                                 | <0.02                                   | <0.02                                  | <0.02                                   | <0.02                                 | <0.02                                 | <0.05                                 | <0.05                                     | <0.05                                     | <0.05                                      | <0.02                                        | <0.05                                             |                                                   |                                                   |                                                     |                                            |                                                       |
| WAPET creek north | SW303             | 20/06/2018 | 0960_SW303_180620 | Normal | 212572    | 0.12                          | <0.01                             | <0.01               | <0.01                                        | <0.01                                          | 0.002                                         | <0.01                                          | 0.12                                         | <0.02                                        | <0.02                                 | <0.01                                   | <0.01                                  | <0.01                                   | <0.01                                 | <0.02                                 | <0.05                                 | <0.01                                     | <0.01                                     | <0.01                                      | <0.01                                        | <0.01                                             | <0.05                                             |                                                   |                                                     |                                            |                                                       |
|                   |                   | 2/12/2019  | 0960_SW303_191202 | Normal | EP1912743 | <0.01                         | <0.01                             | <0.01               | <0.02                                        | <0.02                                          | <0.02                                         | <0.02                                          | <0.02                                        | <0.1                                         | <0.02                                 | <0.02                                   | <0.02                                  | <0.02                                   | <0.02                                 | <0.02                                 | <0.02                                 | <0.05                                     | <0.05                                     | <0.05                                      | <0.05                                        | <0.02                                             | <0.05                                             |                                                   |                                                     |                                            |                                                       |
|                   |                   | 26/05/2020 | 0960_SW303_200526 | Normal | EP2005408 | <0.01                         | <0.01                             | <0.01               | <0.02                                        | <0.02                                          | <0.02                                         | <0.02                                          | <0.01                                        | <0.02                                        | <0.1                                  | <0.02                                   | <0.02                                  | <0.02                                   | <0.02                                 | <0.02                                 | <0.02                                 | <0.02                                     | <0.05                                     | <0.05                                      | <0.05                                        | <0.05                                             | <0.02                                             | <0.05                                             |                                                     |                                            |                                                       |
|                   |                   | 24/06/2020 | 0960_SW303_200624 | Normal | EP2006531 | <0.01                         | <0.01                             | <0.01               | <0.02                                        | <0.02                                          | <0.02                                         | <0.02                                          | <0.01                                        | <0.02                                        | <0.1                                  | <0.02                                   | <0.02                                  | <0.02                                   | <0.02                                 | <0.02                                 | <0.02                                 | <0.02                                     | <0.05                                     | <0.05                                      | <0.05                                        | <0.05                                             | <0.02                                             | <0.05                                             |                                                     |                                            |                                                       |
|                   |                   | 20/11/2020 | 0960_SW303_201120 | Normal | EP2012947 | <0.01                         | <0.01                             | <0.01               | <0.02                                        | <0.02                                          | <0.02                                         | <0.02                                          | <0.01                                        | <0.02                                        | <0.1                                  | <0.02                                   | <0.02                                  | <0.02                                   | <0.02                                 | <0.02                                 | <0.02                                 | <0.02                                     | <0.05                                     | <0.05                                      | <0.05                                        | <0.05                                             | <0.02                                             | <0.05                                             |                                                     |                                            |                                                       |
|                   |                   | 4/03/2021  | 0960_SW303_210304 | Normal | EP2102258 | <0.01                         | <0.01                             | <0.01               | <0.02                                        | <0.02                                          | <0.02                                         | <0.02                                          | <0.01                                        | <0.02                                        | <0.1                                  | <0.02                                   | <0.02                                  | <0.02                                   | <0.02                                 | <0.02                                 | <0.02                                 | <0.02                                     | <0.05                                     | <0.05                                      | <0.05                                        | <0.05                                             | <0.02                                             | <0.05                                             |                                                     |                                            |                                                       |
| WAPET creek north | SW303             | 23/06/2021 | 0960_SW303_210623 | Normal | EP2107270 | <0.01                         | <0.01                             | <0.01               | <0.02                                        | <0.02                                          | <0.02                                         | <0.02                                          | <0.01                                        | <0.02                                        | <0.1                                  | <0.02                                   | <0.02                                  | <0.02                                   | <0.02                                 | <0.02                                 | <0.02                                 | <0.05                                     | <0.05                                     | <0.05                                      | <0.05                                        | <0.02                                             | <0.05                                             |                                                   |                                                     |                                            |                                                       |
|                   |                   | 24/11/2021 | 0960_SW303_211124 | Normal | EP2114399 | <0.01                         | <0.01                             | <0.01               | <0.02                                        | <0.02                                          | <0.02                                         | <0.02                                          | <0.01                                        | <0.02                                        | <0.1                                  | <0.02                                   | <0.02                                  | <0.02                                   | <0.02                                 | <0.02                                 | <0.02                                 | <0.05                                     | <0.05                                     | <0.05                                      | <0.05                                        | <0.02                                             | <0.05                                             |                                                   |                                                     |                                            |                                                       |
|                   |                   | 18/05/2022 | 0960_SW303_220518 | Normal | EP2205970 | <0.01                         | <0.01                             | <0.01               | <0.02                                        | <0.02                                          | <0.01                                         | <0.02                                          | <0.01                                        | <0.02                                        | <0.1                                  | <0.02                                   | <0.02                                  | <0.02                                   | <0.02                                 | <0.02                                 | <0.02                                 | <0.05                                     | <0.05                                     | <0.05                                      | <0.05                                        | <0.02                                             | <0.05                                             |                                                   |                                                     |                                            |                                                       |
|                   |                   | 23/06/2022 | 0960_SW303_220623 | Normal | EP2207816 | 0.02                          | 0.02                              | 0.02                | <0.02                                        | <0.02                                          | <0.01                                         | <0.02                                          | 0.02                                         | <0.02                                        | <0.1                                  | <0.02                                   | <0.02                                  | <0.02                                   | <0.02                                 | <0.02                                 | <0.02                                 | <0.02                                     | <0.05                                     | <0.05                                      | <0.05                                        | <0.05                                             | <0.02                                             | <0.05                                             |                                                     |                                            |                                                       |
|                   |                   | 20/06/2018 | 0960_SW304_180620 | Normal | 212572    | 0.18                          | <0.01                             | <0.01               | <0.01                                        | <0.01                                          | 0.002                                         | 0.002                                          | 0.013                                        | 0.003                                        | 0.17                                  | <0.02                                   | 0.003                                  | 0.004                                   | 0.006                                 | 0.002                                 | 0.003                                 | 0.001                                     | <0.02                                     | <0.02                                      | <0.05                                        | <0.05                                             | <0.01                                             | <0.05                                             |                                                     |                                            |                                                       |
|                   |                   | 26/05/2020 | 0960_SW304_200526 | Normal | EP2005408 | <0.01                         | <0.01                             | <0.01               | <0.02                                        | <0.02                                          | <0.02                                         | <0.02                                          | <0.02                                        | <0.02                                        | <0.1                                  | <0.02                                   | <0.02                                  | <0.02                                   | <0.02                                 | <0.02                                 | <0.02                                 | <0.02                                     | <0.05                                     | <0.05                                      | <0.05                                        | <0.05                                             | <0.02                                             | <0.05                                             |                                                     |                                            |                                                       |
| WAPET creek north | SW304             | 24/06/2020 | 0960_SW304_200624 | Normal | EP2006551 | <0.01                         | <0.01                             | <0.01               | <0.02                                        | <0.02                                          | <0.02                                         | <0.02                                          | <0.01                                        | <0.02                                        | <0.1                                  | <0.02                                   | <0.02                                  | <0.02                                   | <0.02                                 | <0.02                                 | <0.02                                 | <0.05                                     | <0.05                                     | <0.05                                      | <0.05                                        | <0.02                                             | <0.05                                             |                                                   |                                                     |                                            |                                                       |
|                   |                   | 20/11/2020 | 0960_SW304_201120 | Normal | EP2012947 | <0.01                         | <0.01                             | <0.01               | <0.02                                        | <0.02                                          | <0.02                                         | <0.02                                          | <0.01                                        | <0.02                                        | <0.1                                  | <0.02                                   | <0.02                                  | <0.02                                   | <0.02                                 | <0.02                                 | <0.02                                 | <0.05                                     | <0.05                                     | <0.05                                      | <0.05                                        | <0.02                                             | <0.05                                             |                                                   |                                                     |                                            |                                                       |
|                   |                   | 4/03/2021  | 0960_SW304_210304 | Normal | EP2102258 | <0.01                         | <0.01                             | <0.01               | <0.02                                        | <0.02                                          | <0.02                                         | <0.02                                          | <0.01                                        | <0.02                                        | <0.1                                  | <0.02                                   | <0.02                                  | <0.02                                   | <0.02                                 | <0.02                                 | <0.02                                 | <0.05                                     | <0.05                                     | <0.05                                      | <0.05                                        | <0.02                                             | <0.05                                             |                                                   |                                                     |                                            |                                                       |
|                   |                   | 23/06/2021 | 0960_SW304_210623 | Normal | EP2107270 | <0.01                         | <0.01                             | <0.01               | <0.02                                        | <0.02                                          | <0.02                                         | <0.02                                          | <0.01                                        | <0.02                                        | <0.1                                  | <0.02                                   | <0.02                                  | <0.02                                   | <0.02                                 | <0.02                                 | <0.02                                 | <0.02                                     | <0.05                                     | <0.05                                      | <0.05                                        | <0.05                                             | <0.02                                             | <0.05                                             |                                                     |                                            |                                                       |
|                   |                   | 24/11/2021 | 0960_SW304_211124 | Normal | EP2114398 | <0.01                         | <0.01                             | <0.01               | <0.02                                        | <0.02                                          | <0.01                                         | <0.02                                          | <0.01                                        | <0.02                                        | <0.1                                  | <0.02                                   | <0.02                                  | <0.02                                   | <0.02                                 | <0.02                                 | <0.02                                 | <0.02                                     | <0.05                                     | <0.05                                      | <0.05                                        | <0.05                                             | <0.02                                             | <0.05                                             |                                                     |                                            |                                                       |
|                   |                   | 18/05/2022 | 0960_SW304_220518 | Normal | EP2205970 | <0.01                         | <0.01                             | <0.01               | <0.02                                        | <0.02                                          | <0.01                                         | <0.02                                          | <0.01                                        | <0.02                                        | <0.1                                  | <0.02                                   | <0.02                                  | <0.02                                   | <0.02                                 | <0.02                                 | <0.02                                 | <0.02                                     | <0.05                                     | <0.05                                      | <0.05                                        | <0.05                                             | <0.02                                             | <0.05                                             |                                                     |                                            |                                                       |
| 23/06/2022        | 0960_SW304_220623 | Normal     | EP2207816         | <0.01  | <0.01     | <0.01                         | <0.02                             | <0.02               | <0.01                                        | <0.02                                          | <0.01                                         | <0.02                                          | <0.1                                         | <0.02                                        | <0.02                                 | <0.02                                   | <0.02                                  | <0.02                                   | <0.02                                 | <0.02                                 | <0.05                                 | <0.05                                     | <0.05                                     | <0.05</                                    |                                              |                                                   |                                                   |                                                   |                                                     |                                            |                                                       |

**Environmental Standards**  
HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%  
HEPA, January 2020, PFAS NEMP 2020 Recreational Water

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

**Env Stds Comments**  
\*Practical screening guideline of 0.01 µg/L adopted based on typical current laboratory limit of reporting (HEPA, 2020)

Table 1 - Water Analytical Results

|                                   |                   |               |                     |             |                   | PFAS - Perfluoroalkyl Sulfonamides                                |                                                               |                                                    |                                                                  |                                                             | Inorganics                         |                                         |                                |              |               |          |               |                                                  |          |                    |                      |                      |                   |       |
|-----------------------------------|-------------------|---------------|---------------------|-------------|-------------------|-------------------------------------------------------------------|---------------------------------------------------------------|----------------------------------------------------|------------------------------------------------------------------|-------------------------------------------------------------|------------------------------------|-----------------------------------------|--------------------------------|--------------|---------------|----------|---------------|--------------------------------------------------|----------|--------------------|----------------------|----------------------|-------------------|-------|
|                                   |                   |               |                     |             |                   | N-Methyl<br>perfluorooctane<br>sulfonamidoacetic<br>acid (MeFOAA) | N-methyl<br>perfluorooctane<br>sulfonamidoethanol<br>(MeFOSE) | N-Ethyl<br>perfluorooctane<br>sulfonamide (EtFOSA) | N-Ethyl<br>perfluorooctane<br>sulfonamidoacetic<br>acid (EtFOAA) | N-Ethyl<br>perfluorooctane<br>sulfonamidoethanol<br>(EFOSE) | Carbonate Alkalinity<br>(as CaCO3) | Alkalinity<br>(Bicarbonate as<br>CaCO3) | Alkalinity (total) as<br>CaCO3 | Anions Total | Cations Total | Chloride | Ionic Balance | Sulphate as SO4 -<br>Turbidimetric<br>(filtered) | Sulphate | Calcium (filtered) | Magnesium (filtered) | Potassium (filtered) | Sodium (filtered) |       |
|                                   |                   |               |                     |             |                   | µg/L                                                              | µg/L                                                          | µg/L                                               | µg/L                                                             | µg/L                                                        | mg/L                               | mg/L                                    | mg/L                           | meq/L        | meq/L         | mg/L     | %             | mg/L                                             | mg/L     | mg/L               | mg/L                 | mg/L                 | mg/L              |       |
| LOR - Limit of Reporting          |                   |               |                     |             |                   | 0.02                                                              | 0.05                                                          | 0.05                                               | 0.02                                                             | 0.05                                                        | 1                                  | 1                                       | 1                              | 0.01         | 0.01          | 1        | 0.01          | 1                                                | 1        | 0.5                | 0.5                  | 0.5                  | 0.5               |       |
| PFAS NEMP 2020 Interim Marine 99% |                   |               |                     |             |                   |                                                                   |                                                               |                                                    |                                                                  |                                                             |                                    |                                         |                                |              |               |          |               |                                                  |          |                    |                      |                      |                   |       |
| PFAS NEMP 2020 Recreational Water |                   |               |                     |             |                   |                                                                   |                                                               |                                                    |                                                                  |                                                             |                                    |                                         |                                |              |               |          |               |                                                  |          |                    |                      |                      |                   |       |
| Monitoring Area                   | Location Code     | Date          | Field ID            | Sample Type | Lab Report Number |                                                                   |                                                               |                                                    |                                                                  |                                                             |                                    |                                         |                                |              |               |          |               |                                                  |          |                    |                      |                      |                   |       |
| Source Area 1                     | MW018             | 18/09/2010    | MW18                | Normal      | ES1019112         |                                                                   |                                                               |                                                    |                                                                  |                                                             |                                    |                                         |                                |              |               |          |               |                                                  |          |                    |                      |                      |                   |       |
|                                   |                   | 11/03/2011    | MW018               | Normal      | EP1101571         |                                                                   |                                                               |                                                    |                                                                  |                                                             |                                    |                                         |                                |              |               |          |               |                                                  |          |                    |                      |                      |                   |       |
|                                   |                   | 6/11/2013     | WA0043_MW018        | Normal      | EP1308516         |                                                                   |                                                               |                                                    |                                                                  |                                                             |                                    |                                         |                                |              |               |          |               |                                                  |          |                    |                      |                      |                   |       |
|                                   |                   | 23/03/2014    | WA0043-MW018-230314 | Normal      | EP1402252         |                                                                   |                                                               |                                                    |                                                                  |                                                             |                                    |                                         |                                |              |               |          |               |                                                  |          |                    |                      |                      |                   |       |
|                                   |                   | 9/06/2015     | WA0043-MW18         | Normal      | EP1511012         |                                                                   |                                                               |                                                    |                                                                  |                                                             |                                    |                                         |                                |              |               |          |               |                                                  |          |                    |                      |                      |                   |       |
|                                   |                   | 6/10/2015     | WA0043-MW018        | Normal      | EP1514597         |                                                                   |                                                               |                                                    |                                                                  |                                                             |                                    |                                         |                                |              |               |          |               |                                                  |          |                    |                      |                      |                   |       |
|                                   |                   | 15/03/2016    | WA0043_MW18_150316  | Normal      | EP1602318         |                                                                   |                                                               |                                                    |                                                                  |                                                             |                                    |                                         |                                |              |               |          |               |                                                  |          |                    |                      |                      |                   |       |
|                                   |                   | 3/12/2016     | MW018               | Normal      | 527022            |                                                                   |                                                               |                                                    |                                                                  |                                                             |                                    |                                         |                                |              |               |          |               |                                                  |          |                    |                      |                      |                   |       |
|                                   |                   | 6/03/2018     | 0960_MW018_180306   | Normal      | 207817            | <0.002                                                            | <0.005                                                        | <0.01                                              | <0.002                                                           | <0.05                                                       |                                    | 730                                     |                                |              |               |          | 960           | -5.9                                             |          | 490                | 31                   | 35                   | 23                | 940   |
|                                   |                   | 10/06/2018    | 0960_MW018_180610   | Normal      | 211878            | <0.002                                                            | <0.005                                                        | <0.01                                              | <0.002                                                           | <0.05                                                       |                                    | 770                                     |                                |              |               |          | 970           | 4.2                                              |          | 500                | 41                   | 47                   | 27                | 1,200 |
|                                   |                   | 26/11/2019    | 0960_MW018_191126   | Normal      | EP1912481         | <0.02                                                             | <0.05                                                         | <0.05                                              | <0.02                                                            | <0.05                                                       | <1                                 | 323                                     | 323                            | 10.3         | 10.6          | 128      | 1.41          | 12                                               |          | 110                | 9                    | 8                    | 96                |       |
|                                   |                   | 24/06/2020    | 0960_MW018_200624   | Normal      | EP2006512         | <0.02                                                             | <0.05                                                         | <0.05                                              | <0.02                                                            | <0.05                                                       | <1                                 | 968                                     | 968                            | 42.1         | 35.9          | 571      | 7.99          | 320                                              |          | 16                 | 20                   | 30                   | 751               |       |
|                                   |                   | 19/11/2020    | 0960_MW018_201119   | Normal      | EP2012892         | <0.02                                                             | <0.05                                                         | <0.05                                              | <0.02                                                            | <0.05                                                       | <1                                 | 857                                     | 857                            | 36.6         | 35.1          | 475      | 2.09          | 294                                              |          | 12                 | 16                   | 27                   | 748               |       |
|                                   |                   | 23/06/2021    | 0960_MW018_210623   | Normal      | EP2107193         | <0.02                                                             | <0.05                                                         | <0.05                                              | <0.02                                                            | <0.05                                                       | 24                                 | 933                                     | 956                            | 31.4         | 29.3          | 307      | 3.49          | 174                                              |          | 6                  | 9                    | 22                   | 636               |       |
|                                   |                   | 25/11/2021    | 0960_MW018_211125   | Normal      | EP2114474         | <0.02                                                             | <0.05                                                         | <0.05                                              | <0.02                                                            | <0.05                                                       | <1                                 | 938                                     | 938                            | 33.3         | 28.0          | 361      | 8.76          | 211                                              |          | 5                  | 8                    | 20                   | 610               |       |
|                                   |                   | 22/06/2022    | 0960_MW018_220622   | Normal      | EP2207731         | <0.02                                                             | <0.05                                                         | <0.05                                              | <0.02                                                            | <0.05                                                       | <1                                 | 996                                     | 996                            | 29.4         | 25.1          | 214      | 7.93          | 166                                              |          | 8                  | 10                   | 21                   | 536               |       |
| Source Area 1                     | MW021             | 18/09/2010    | MW21                | Normal      | ES1019112         |                                                                   |                                                               |                                                    |                                                                  |                                                             |                                    |                                         |                                |              |               |          |               |                                                  |          |                    |                      |                      |                   |       |
|                                   |                   | 11/03/2011    | MW021               | Normal      | EP1101571         |                                                                   |                                                               |                                                    |                                                                  |                                                             |                                    |                                         |                                |              |               |          |               |                                                  |          |                    |                      |                      |                   |       |
|                                   |                   | 8/11/2013     | WA0043_MW021        | Normal      | EP1308516         |                                                                   |                                                               |                                                    |                                                                  |                                                             |                                    |                                         |                                |              |               |          |               |                                                  |          |                    |                      |                      |                   |       |
|                                   |                   | 23/03/2014    | WA0043_MW021_230314 | Normal      | EP1402252         |                                                                   |                                                               |                                                    |                                                                  |                                                             |                                    |                                         |                                |              |               |          |               |                                                  |          |                    |                      |                      |                   |       |
|                                   |                   | 9/06/2015     | WA0043-MW021        | Normal      | EP1511012         |                                                                   |                                                               |                                                    |                                                                  |                                                             |                                    |                                         |                                |              |               |          |               |                                                  |          |                    |                      |                      |                   |       |
|                                   |                   | 6/10/2015     | WA043-MW021         | Normal      | EP1514597         |                                                                   |                                                               |                                                    |                                                                  |                                                             |                                    |                                         |                                |              |               |          |               |                                                  |          |                    |                      |                      |                   |       |
|                                   |                   | 15/03/2016    | WA0043_MW021_150316 | Normal      | EP1602318         |                                                                   |                                                               |                                                    |                                                                  |                                                             |                                    |                                         |                                |              |               |          |               |                                                  |          |                    |                      |                      |                   |       |
|                                   |                   | 3/12/2016     | MW021               | Normal      | 527022            |                                                                   |                                                               |                                                    |                                                                  |                                                             |                                    |                                         |                                |              |               |          |               |                                                  |          |                    |                      |                      |                   |       |
|                                   |                   | 6/03/2018     | 0960_MW021_180306   | Normal      | 207817            | <0.002                                                            | <0.005                                                        | <0.01                                              | <0.002                                                           | <0.05                                                       |                                    | 520                                     |                                |              |               |          | 2,900         | 0.49                                             |          | 660                | 160                  | 170                  | 51                | 1,900 |
|                                   |                   | 10/06/2018    | 0960_MW021_180610   | Normal      | 211878            | <0.002                                                            | <0.005                                                        | <0.01                                              | <0.002                                                           | <0.05                                                       |                                    | 670                                     |                                |              |               |          | 2,400         | 3.6                                              |          | 450                | 120                  | 130                  | 42                | 1,800 |
|                                   |                   | 26/11/2019    | 0960_MW021_191126   | Normal      | EP1912480         | <0.02                                                             | <0.05                                                         | <0.05                                              | <0.02                                                            | <0.05                                                       | 5                                  | 1,130                                   | 1,140                          | 46.7         | 46.0          | 720      | 0.74          | 173                                              |          | 19                 | 27                   | 32                   | 966               |       |
|                                   |                   | 24/06/2020    | 0960_MW021_200624   | Normal      | EP2006512         | <0.02                                                             | <0.05                                                         | <0.05                                              | <0.02                                                            | <0.05                                                       | <1                                 | 1,100                                   | 1,100                          | 42.0         | 34.8          | 597      | 9.46          | 155                                              |          | 10                 | 16                   | 27                   | 742               |       |
|                                   |                   | 23/06/2021    | 0960_MW021_210623   | Normal      | EP2107193         | <0.02                                                             | <0.05                                                         | <0.05                                              | <0.02                                                            | <0.05                                                       | <1                                 | 702                                     | 702                            | 82.0         | 73.8          | 2,180    | 5.25          | 312                                              |          | 82                 | 91                   | 53                   | 1,400             |       |
|                                   |                   | 24/11/2021    | 0960_MW021_211124   | Normal      | EP2114395         | <0.02                                                             | <0.05                                                         | <0.05                                              | <0.02                                                            | <0.05                                                       | <1                                 | 999                                     | 999                            | 41.1         | 34.2          | 659      | 9.16          | 121                                              |          | 4                  | 8                    | 22                   | 753               |       |
|                                   |                   | 22/06/2022    | 0960_MW021_220622   | Normal      | EP2207731         | <0.02                                                             | <0.05                                                         | <0.05                                              | <0.02                                                            | <0.05                                                       | <1                                 | 1,150                                   | 1,150                          | 31.4         | 27.9          | 234      | 5.79          | 86                                               |          | 4                  | 7                    | 21                   | 612               |       |
|                                   |                   | Source Area 1 | MW112               | 8/03/2018   | 0960_MW112_180308 | Normal                                                            | 208042                                                        | <0.002                                             | <0.005                                                           | <0.05                                                       | <0.002                             | <0.05                                   |                                | 670          |               |          |               | 4,000                                            | -0.51    |                    | 1,600                | 150                  | 190               | 90    |
| 8/06/2018                         | 0960_MW112_180608 |               |                     | Normal      | 211878            | <0.002                                                            | <0.005                                                        | <0.01                                              | <0.002                                                           | <0.05                                                       |                                    | 650                                     |                                |              |               | 3,800    | 3.4           |                                                  | 1,400    | 150                | 200                  | 91                   | 3,100             |       |
| 26/11/2019                        | 0960_MW112_191126 |               |                     | Normal      | EP1912480         | <0.05                                                             | <0.12                                                         | <0.12                                              | <0.05                                                            | <0.12                                                       | <1                                 | 687                                     | 687                            | 146          | 155           | 3,690    | 3.27          | 1,330                                            |          | 146                | 218                  | 121                  | 2,920             |       |
| 25/06/2020                        | 0960_MW112_200625 |               |                     | Normal      | EP2006591         | <0.02                                                             | <0.05                                                         | <0.05                                              | <0.02                                                            | <0.05                                                       | <1                                 | 699                                     | 699                            | 144          | 138           | 3,620    | 2.05          | 1,340                                            |          | 135                | 173                  | 110                  | 2,630             |       |
| 19/11/2020                        | 0960_MW112_201119 |               |                     | Normal      | EP2012917         | <0.02                                                             | <0.05                                                         | <0.05                                              | <0.02                                                            | <0.05                                                       | <1                                 | 658                                     | 658                            | 141          | 141           | 3,530    | 0.04          | 1,360                                            |          | 130                | 184                  | 115                  | 2,680             |       |
| 24/06/2021                        | 0960_MW112_210624 |               |                     | Normal      | EP2107276         | <0.02                                                             | <0.05                                                         | <0.05                                              | <0.02                                                            | <0.05                                                       | <1                                 | 726                                     | 726                            | 131          | 141           | 3,360    | 3.64          | 1,050                                            |          | 111                | 169                  | 112                  | 2,730             |       |
| 25/11/2021                        | 0960_MW112_211125 |               |                     | Normal      | EP2114471         | <0.02                                                             | <0.05                                                         | <0.05                                              | <0.02                                                            | <0.05                                                       | <1                                 | 717                                     | 717                            | 126          | 118           | 3,080    | 3.38          | 1,200                                            |          | 114                | 156                  | 94                   | 2,230             |       |
| 22/06/2022                        | 0960_MW112_220622 |               |                     | Normal      | EP2207737         | <0.02                                                             | <0.05                                                         | <0.05                                              | <0.02                                                            | <0.05                                                       | <1                                 | 755                                     | 755                            | 129          | 124           | 3,180    | 1.89          | 1,150                                            |          | 102                | 145                  | 116                  | 2,390             |       |
| 6/03/2018                         | 0960_MW113_180306 |               |                     | Normal      | 207817            | <0.002                                                            | <0.005                                                        | <0.01                                              | <0.002                                                           | <0.05                                                       |                                    | 410                                     |                                |              |               |          | 2,800         | 3.7                                              |          | 290                | 210                  | 160                  | 43                | 1,700 |
| 14/06/2018                        | 0960_MW113_180614 |               |                     | Normal      | 212372            | <0.002                                                            | <0.005                                                        | <0.01                                              | <0.002                                                           | <0.05                                                       |                                    | 420                                     |                                |              |               |          | 3,000         | 0.73                                             |          | 250                | 220                  | 170                  | 44                | 1,700 |
| 29/11/2019                        | 0960_MW113_191129 | Normal        | EP1912676           | <0.02       | <0.05             | <0.05                                                             | <0.02                                                         | <0.05                                              | <1                                                               | 401                                                         | 401                                | 95.8                                    | 103                            | 2,940        | 3.62          | 231      |               | 195                                              | 180      | 72                 | 1,760                |                      |                   |       |
| 24/06/2020                        | 0960_MW113_200624 | Normal        | EP2006512           | <0.02       | <0.05             | <0.05                                                             | <0.02                                                         | <0.05                                              | <1                                                               | 404                                                         | 404                                | 110                                     | 99.5                           | 3,420        | 4.97          | 260      |               | 239                                              | 190      | 76                 | 1,610                |                      |                   |       |
| 19/11/2020                        | 0960_MW113_201119 | Normal        | EP2012892           | <0.02       | <0.05             | <0.05                                                             | <0.02                                                         | <0.05                                              | <1                                                               | 378                                                         | 378                                | 99.4                                    | 107                            | 3,060        | 3.86          | 268      |               | 216                                              | 189      | 76                 | 1,820                |                      |                   |       |
| 23/06/2021                        | 0960_MW113_210623 | Normal        | EP2107193           | <0.02       | <0.05             | <0.05                                                             | <0.02                                                         | <0.05                                              | <1                                                               | 379                                                         | 379                                | 104                                     | 105                            | 3,240        | 0.57          | 254      |               | 197                                              | 176      | 77                 | 1,820                |                      |                   |       |
| 24/11/2021                        | 0960_MW113_211124 | Normal        | EP2114395           | <0.02       | <0.05             | <0.05                                                             | <0.02                                                         | <0.05                                              | <1                                                               | 386                                                         | 386                                | 100                                     | 101                            | 3,070        | 0.61          | 272      |               | 210                                              | 178      | 66                 | 1,710                |                      |                   |       |
| 22/06/2022                        | 0960_MW113_22062  |               |                     |             |                   |                                                                   |                                                               |                                                    |                                                                  |                                                             |                                    |                                         |                                |              |               |          |               |                                                  |          |                    |                      |                      |                   |       |



|               |       |            |                    |        |           | PFAS - Perfluoroalkyl Sulfonamides                                 |                                                               |                                                   |                                                                  |                                                             |                                    | Inorganics                              |                                |              |               |          |               |                                                  |          |                    |                      |                      |                   |  |  |  |
|---------------|-------|------------|--------------------|--------|-----------|--------------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------|------------------------------------------------------------------|-------------------------------------------------------------|------------------------------------|-----------------------------------------|--------------------------------|--------------|---------------|----------|---------------|--------------------------------------------------|----------|--------------------|----------------------|----------------------|-------------------|--|--|--|
|               |       |            |                    |        |           | N-Methyl<br>perfluorooctane<br>sulfonamidoacetic<br>acid (MeFOSAA) | N-methyl<br>perfluorooctane<br>sulfonamidoethanol<br>(MeFOSE) | N-Ethyl<br>perfluorooctane<br>sulfonamide (EFOSA) | N-Ethyl<br>perfluorooctane<br>sulfonamidoacetic<br>acid (EFOSAA) | N-Ethyl<br>perfluorooctane<br>sulfonamidoethanol<br>(EFOSE) | Carbonate Alkalinity<br>(as CaCO3) | Alkalinity<br>(Bicarbonate as<br>CaCO3) | Alkalinity (total) as<br>CaCO3 | Anions Total | Cations Total | Chloride | Ionic Balance | Sulphate as SO4 -<br>Turbidimetric<br>(filtered) | Sulphate | Calcium (filtered) | Magnesium (filtered) | Potassium (filtered) | Sodium (filtered) |  |  |  |
|               |       |            |                    |        |           | µg/L                                                               | µg/L                                                          | µg/L                                              | µg/L                                                             | µg/L                                                        | mg/L                               | mg/L                                    | mg/L                           | meq/L        | meq/L         | mg/L     | %             | mg/L                                             | mg/L     | mg/L               | mg/L                 | mg/L                 | mg/L              |  |  |  |
| Source Area 1 | MW167 | 26/11/2019 | 0960_MW167_191126  | Normal | EP1912481 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 857                                     | 857                            | 56.4         | 60.5          | 1,120    | 3.50          | 369                                              |          | 36                 | 42                   | 51                   | 1,240             |  |  |  |
|               |       | 25/06/2020 | 0960_MW167_200625  | Normal | EP2006591 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 958                                     | 958                            | 58.0         | 51.6          | 1,110    | 5.78          | 362                                              |          | 38                 | 36                   | 44                   | 1,050             |  |  |  |
|               |       | 19/11/2020 | 0960_MW167_201119  | Normal | EP2012917 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 859                                     | 859                            | 55.5         | 55.4          | 1,090    | 0.16          | 366                                              |          | 30                 | 36                   | 51                   | 1,140             |  |  |  |
|               |       | 23/06/2021 | 0960_MW167_210623  | Normal | EP2107193 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 877                                     | 877                            | 60.2         | 55.3          | 1,290    | 4.29          | 303                                              |          | 24                 | 33                   | 52                   | 1,150             |  |  |  |
|               |       | 24/11/2021 | 0960_MW167_211124  | Normal | EP2114395 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 889                                     | 889                            | 53.8         | 49.9          | 1,050    | 3.70          | 306                                              |          | 20                 | 27                   | 40                   | 1,050             |  |  |  |
|               |       | 22/06/2022 | 0960_MW167_220622  | Normal | EP2207737 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 917                                     | 917                            | 51.9         | 47.5          | 950      | 4.40          | 324                                              |          | 26                 | 30                   | 48                   | 977               |  |  |  |
| Source Area 1 | MW168 | 10/06/2018 | 0960_MW168_180610  | Normal | 211878    | <0.002                                                             | <0.005                                                        | <0.01                                             | <0.002                                                           | <0.05                                                       |                                    | 610                                     |                                |              |               | 3,900    | 3.2           |                                                  | 680      | 230                | 240                  | 78                   | 2,600             |  |  |  |
|               |       | 26/11/2019 | 0960_MW168_191126  | Normal | EP1912481 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 630                                     | 630                            | 132          | 141           | 3,700    | 3.49          | 703                                              |          | 204                | 242                  | 106                  | 2,490             |  |  |  |
|               |       | 25/06/2020 | 0960_MW168_200625  | Normal | EP2006591 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 573                                     | 573                            | 136          | 134           | 3,900    | 1.08          | 719                                              |          | 207                | 217                  | 105                  | 2,360             |  |  |  |
|               |       | 19/11/2020 | 0960_MW168_201119  | Normal | EP2012917 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 545                                     | 545                            | 143          | 134           | 4,150    | 3.37          | 716                                              |          | 218                | 231                  | 107                  | 2,320             |  |  |  |
|               |       | 23/06/2021 | 0960_MW168_210623  | Normal | EP2107193 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 561                                     | 561                            | 130          | 134           | 3,680    | 1.58          | 734                                              |          | 191                | 217                  | 106                  | 2,400             |  |  |  |
|               |       | 24/11/2021 | 0960_MW168_211124  | Normal | EP2114395 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 579                                     | 579                            | 128          | 128           | 3,620    | 0.28          | 703                                              |          | 179                | 201                  | 98                   | 2,290             |  |  |  |
| Source Area 1 | MW211 | 22/06/2022 | 0960_MW168_220622  | Normal | EP2207737 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 603                                     | 603                            | 127          | 122           | 3,580    | 1.88          | 681                                              |          | 165                | 192                  | 109                  | 2,200             |  |  |  |
|               |       | 9/03/2018  | 0960_MW168_180309  | Normal | 208042    | <0.002                                                             | <0.005                                                        | <0.01                                             | <0.002                                                           | <0.05                                                       |                                    | 880                                     |                                |              |               | 97       | -1.3          |                                                  | 79       | 5                  | 8.4                  | 14                   | 470               |  |  |  |
|               |       | 9/06/2018  | 0960_MW168_180609  | Normal | 211878    | <0.002                                                             | <0.005                                                        | <0.01                                             | <0.002                                                           | <0.05                                                       |                                    | 1,200                                   |                                |              |               | 140      | -9.6          |                                                  | 87       | 6.2                | 11                   | 14                   | 550               |  |  |  |
|               |       | 26/11/2019 | 0960_MW168_191126  | Normal | EP1912479 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | 29                                 | 808                                     | 838                            | 23.4         | 23.6          | 162      | 0.42          | 99                                               |          | 4                  | 8                    | 19                   | 511               |  |  |  |
|               |       | 24/06/2020 | 0960_MW211_200624  | Normal | EP2006512 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | 28                                 | 877                                     | 904                            | 25.4         | 21.6          | 189      | 8.18          | 96                                               |          | 4                  | 8                    | 20                   | 464               |  |  |  |
|               |       | 19/11/2020 | 0960_MW211_201119  | Normal | EP2012892 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | 49                                 | 756                                     | 804                            | 23.1         | 21.9          | 177      | 2.57          | 98                                               |          | 2                  | 6                    | 20                   | 479               |  |  |  |
| Source Area 1 | MW233 | 23/06/2021 | 0960_MW211_210623  | Normal | EP2107193 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | 35                                 | 750                                     | 786                            | 20.8         | 19.5          | 134      | 3.42          | 66                                               |          | 2                  | 4                    | 17                   | 428               |  |  |  |
|               |       | 25/11/2021 | 0960_MW211_211125  | Normal | EP2114474 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | 32                                 | 730                                     | 763                            | 21.5         | 19.2          | 158      | 5.60          | 86                                               |          | 2                  | 4                    | 15                   | 423               |  |  |  |
|               |       | 22/06/2022 | 0960_MW211_220622  | Normal | EP2207737 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | 26                                 | 620                                     | 646                            | 17.8         | 17.3          | 132      | 1.49          | 59                                               |          | 3                  | 5                    | 18                   | 375               |  |  |  |
|               |       | 6/10/2015  | WA0043-MW63A       | Normal | EP1514597 |                                                                    |                                                               |                                                   |                                                                  |                                                             | 16                                 | 1,040                                   | 1,050                          | 36.4         | 38.4          | 391      | 2.62          | 210                                              |          | 13                 | 16                   | 19                   | 826               |  |  |  |
|               |       | 14/03/2016 | MW63_140316        | Normal | EP1602253 |                                                                    |                                                               |                                                   |                                                                  |                                                             | <1                                 | 972                                     | 972                            | 28.6         | 26.7          | 239      | 3.58          | 119                                              |          | 8                  | 9                    | 16                   | 578               |  |  |  |
|               |       | 2/12/2016  | MW063A             | Normal | 527022    |                                                                    |                                                               |                                                   |                                                                  |                                                             |                                    |                                         |                                |              |               |          |               |                                                  |          |                    |                      |                      |                   |  |  |  |
| Source Area 1 | MW233 | 6/03/2018  | 0960_MW063A_180306 | Normal | 207817    | <0.002                                                             | <0.005                                                        | <0.01                                             | <0.002                                                           | <0.05                                                       |                                    | 710                                     |                                |              |               | 170      | -3.1          |                                                  | 66       | 5.3                | 4.7                  | 11                   | 420               |  |  |  |
|               |       | 10/06/2018 | 0960_MW063A_180610 | Normal | 211878    | <0.002                                                             | <0.005                                                        | <0.01                                             | <0.002                                                           | <0.05                                                       |                                    | 670                                     |                                |              |               | 150      | 1.6           |                                                  | 51       | 4.8                | 4.5                  | 10                   | 430               |  |  |  |
|               |       | 26/11/2019 | 0960_MW063A_191126 | Normal | EP1912479 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | 19                                 | 742                                     | 761                            | 20.5         | 19.4          | 154      | 2.78          | 46                                               |          | 4                  | 4                    | 15                   | 425               |  |  |  |
|               |       | 23/06/2021 | 0960_MW233_210623  | Normal | EP2107193 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | 28                                 | 596                                     | 625                            | 18.5         | 17.0          | 186      | 4.23          | 38                                               |          | 3                  | 3                    | 14                   | 374               |  |  |  |
|               |       | 24/11/2021 | 0960_MW233_211124  | Normal | EP2114395 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | 10                                 | 585                                     | 595                            | 18.4         | 15.2          | 207      | 9.61          | 32                                               |          | 3                  | 2                    | 11                   | 335               |  |  |  |
|               |       | 22/06/2022 | 0960_MW233_220622  | Normal | EP2207731 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | 3                                  | 580                                     | 584                            | 18.9         | 15.6          | 226      | 9.46          | 41                                               |          | 3                  | 3                    | 14                   | 342               |  |  |  |
| Source Area 2 | MW159 | 15/06/2018 | 0960_MW159_180615  | Normal | 212372    | <0.002                                                             | <0.005                                                        | <0.01                                             | <0.002                                                           | <0.05                                                       |                                    | 380                                     |                                |              |               | 8,200    | 7.1           |                                                  | 1,100    | 390                | 500                  | 180                  | 5,400             |  |  |  |
|               |       | 16/03/2020 | MW159_200316       | Normal | EP2002956 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       |                                    |                                         |                                |              |               |          |               |                                                  |          |                    |                      |                      |                   |  |  |  |
|               |       | 24/06/2020 | 0960_MW159_200624  | Normal | EP2006515 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 413                                     | 413                            | 266          | 242           | 8,350    | 4.60          | 1,050                                            |          | 320                | 431                  | 234                  | 4,250             |  |  |  |
|               |       | 20/11/2020 | 0960_MW159_201120  | Normal | EP2012957 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 457                                     | 457                            | 314          | 298           | 9,920    | 2.58          | 1,200                                            |          | 397                | 551                  | 265                  | 5,200             |  |  |  |
|               |       | 23/06/2021 | 0960_MW159_210623  | Normal | EP2107193 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 447                                     | 447                            | 335          | 355           | 10,700   | 2.91          | 1,160                                            |          | 453                | 683                  | 306                  | 6,170             |  |  |  |
|               |       | 25/11/2021 | 0960_MW159_211125  | Normal | EP2114477 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 482                                     | 482                            | 314          | 304           | 9,910    | 1.62          | 1,180                                            |          | 416                | 607                  | 233                  | 5,220             |  |  |  |
| Source Area 2 | MW105 | 22/06/2022 | 0960_MW159_220622  | Normal | EP2207727 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 461                                     | 461                            | 267          | 281           | 8,250    | 2.54          | 1,210                                            |          | 397                | 574                  | 271                  | 4,760             |  |  |  |
|               |       | 2/12/2019  | 0960_MW105_191202  | Normal | EP1912747 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 379                                     | 379                            | 498          | 626           | 16,200   | 11.4          | 1,590                                            |          | 702                | 1,420                | 494                  | 10,600            |  |  |  |
|               |       | 25/06/2020 | 0960_MW105_200625  | Normal | EP2006591 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 394                                     | 394                            | 490          | 511           | 15,900   | 2.15          | 1,600                                            |          | 587                | 1,090                | 470                  | 8,740             |  |  |  |
|               |       | 23/06/2021 | 0960_MW105_210623  | Normal | EP2107193 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 363                                     | 363                            | 479          | 526           | 15,600   | 4.71          | 1,520                                            |          | 556                | 1,150                | 486                  | 9,000             |  |  |  |
|               |       | 24/11/2021 | 0960_MW105_211124  | Normal | EP2114392 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 358                                     | 358                            | 441          | 508           | 14,300   | 7.03          | 1,470                                            |          | 604                | 1,190                | 427                  | 8,480             |  |  |  |
|               |       | 22/06/2022 | 0960_MW105_220622  |        |           |                                                                    |                                                               |                                                   |                                                                  |                                                             |                                    |                                         |                                |              |               |          |               |                                                  |          |                    |                      |                      |                   |  |  |  |

Table 1 - Water Analytical Results

|                             |                   |                             |                           |            |                   | PFAS - Perfluoroalkyl Sulfonamides                                 |                                                               |                                                   |                                                                  |                                                             | Inorganics                         |                                         |                                |              |               |          |               |                                                  |          |                    |                      |                      |                   |     |
|-----------------------------|-------------------|-----------------------------|---------------------------|------------|-------------------|--------------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------|------------------------------------------------------------------|-------------------------------------------------------------|------------------------------------|-----------------------------------------|--------------------------------|--------------|---------------|----------|---------------|--------------------------------------------------|----------|--------------------|----------------------|----------------------|-------------------|-----|
|                             |                   |                             |                           |            |                   | N-Methyl<br>perfluorooctane<br>sulfonamidoacetic<br>acid (MeFOSAA) | N-methyl<br>perfluorooctane<br>sulfonamidoethanol<br>(MeFOSE) | N-Ethyl<br>perfluorooctane<br>sulfonamide (EFOSA) | N-Ethyl<br>perfluorooctane<br>sulfonamidoacetic<br>acid (EFOSAA) | N-Ethyl<br>perfluorooctane<br>sulfonamidoethanol<br>(EFOSE) | Carbonate Alkalinity<br>(as CaCO3) | Alkalinity<br>(Bicarbonate as<br>CaCO3) | Alkalinity (total) as<br>CaCO3 | Anions Total | Cations Total | Chloride | Ionic Balance | Sulphate as SO4 -<br>Turbidimetric<br>(filtered) | Sulphate | Calcium (filtered) | Magnesium (filtered) | Potassium (filtered) | Sodium (filtered) |     |
|                             |                   |                             |                           |            |                   | µg/L                                                               | µg/L                                                          | µg/L                                              | µg/L                                                             | µg/L                                                        | mg/L                               | mg/L                                    | mg/L                           | meq/L        | meq/L         | mg/L     | %             | mg/L                                             | mg/L     | mg/L               | mg/L                 | mg/L                 | mg/L              |     |
| On-site Pathway             | MW127             | 7/03/2018                   | 0960_MW127_180307         | Normal     | 207857            | <0.002                                                             | <0.005                                                        | <0.01                                             | <0.002                                                           | <0.05                                                       |                                    | 150                                     |                                |              |               | 28,000   | 0.11          |                                                  | 3,300    | 1,000              | 1,600                | 360                  | 15,000            |     |
|                             |                   | 8/06/2018                   | 0960_MW127_180608         | Normal     | 211878            | <0.002                                                             | <0.005                                                        | <0.01                                             | <0.002                                                           | <0.05                                                       |                                    | 1,500                                   |                                |              |               | 27,000   | 1             |                                                  | 2,600    | 1,000              | 1,600                | 340                  | 15,000            |     |
|                             |                   | 29/11/2019                  | 0960_MW127_191129         | Normal     | EP1912676         | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 160                                     | 160                            | 788          | 866           | 25,900   | 4.71          | 2,620                                            |          | 1,200              | 1,800                | 567                  | 14,800            |     |
|                             |                   | 25/06/2020                  | 0960_MW127_200625         | Normal     | EP2006591         | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 146                                     | 146                            | 764          | 895           | 25,000   | 7.90          | 2,680                                            |          | 1,130              | 1,730                | 519                  | 15,700            |     |
|                             |                   | 19/11/2020                  | 0960_MW127_201119         | Normal     | EP2012917         | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 145                                     | 145                            | 830          | 898           | 26,900   | 3.94          | 3,270                                            |          | 1,140              | 1,840                | 599                  | 15,500            |     |
|                             |                   | 23/06/2021                  | 0960_MW127_210623         | Normal     | EP2107189         | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 152                                     | 152                            | 772          | 842           | 25,500   | 4.33          | 2,400                                            |          | 1,080              | 1,690                | 553                  | 14,600            |     |
|                             |                   | 25/11/2021                  | 0960_MW127_211125         | Normal     | EP2114471         | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 145                                     | 145                            | 775          | 870           | 25,500   | 5.81          | 2,520                                            |          | 1,060              | 1,740                | 511                  | 15,200            |     |
|                             |                   | 22/06/2022                  | 0960_MW127_220622         | Normal     | EP2207731         | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 165                                     | 165                            | 734          | 806           | 24,000   | 4.70          | 2,570                                            |          | 1,070              | 1,630                | 548                  | 13,900            |     |
| On-site Pathway             | MW170             | 18/06/2018                  | 0960_MW170_180618         | Normal     | 212372            | <0.002                                                             | <0.005                                                        | <0.01                                             | <0.002                                                           | <0.05                                                       |                                    | 240                                     |                                |              |               | 19,000   | 1.2           |                                                  | 1,700    | 900                | 1,000                | 170                  | 11,000            |     |
|                             |                   | 29/11/2019                  | 0960_MW170_191129         | Normal     | EP1912676         | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 222                                     | 222                            | 469          | 531           | 15,200   | 6.15          | 1,740                                            |          | 923                | 1,050                | 239                  | 9,020             |     |
|                             |                   | 24/06/2020                  | 0960_MW170_200624         | Normal     | EP2006515         | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 302                                     | 302                            | 551          | 539           | 18,000   | 1.10          | 1,770                                            |          | 925                | 1,030                | 278                  | 9,210             |     |
|                             |                   | 19/11/2020                  | 0960_MW170_201119         | Normal     | EP2012894         | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 205                                     | 205                            | 507          | 552           | 16,600   | 4.32          | 1,650                                            |          | 868                | 1,040                | 269                  | 9,580             |     |
|                             |                   | 23/06/2021                  | 0960_MW170_210623         | Normal     | EP2107189         | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 236                                     | 236                            | 529          | 580           | 17,500   | 4.52          | 1,490                                            |          | 995                | 1,100                | 255                  | 9,950             |     |
|                             |                   | 23/11/2021                  | 0960_MW170_211123         | Normal     | EP2114467         | <0.0005                                                            | <0.001                                                        | <0.001                                            | <0.0005                                                          | <0.001                                                      |                                    |                                         |                                |              |               |          |               |                                                  |          |                    |                      |                      |                   |     |
|                             |                   | 25/11/2021                  | 0960_MW170_211125         | Normal     | EP2114477         | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 208                                     | 208                            | 459          | 460           | 15,000   | 0.12          | 1,510                                            |          | 684                | 891                  | 173                  | 8,000             |     |
|                             |                   | 22/06/2022                  | 0960_MW170_220622         | Normal     | EP2207727         | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 204                                     | 204                            | 434          | 481           | 14,100   | 5.10          | 1,570                                            |          | 742                | 947                  | 222                  | 8,290             |     |
| On-site Pathway             | MW172             | 18/06/2018                  | 0960_MW172_180618         | Normal     | 212372            | <0.020                                                             | <0.050                                                        | <0.10                                             | <0.020                                                           | <0.50                                                       |                                    | 260                                     |                                |              |               | 15,000   | -1.5          |                                                  | 2,600    | 560                | 760                  | 180                  | 8,800             |     |
|                             |                   | 29/11/2019                  | 0960_MW172_191129         | Normal     | EP1912676         | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 257                                     | 257                            | 393          | 442           | 11,800   | 5.88          | 2,660                                            |          | 524                | 737                  | 254                  | 8,030             |     |
|                             |                   | 24/06/2020                  | 0960_MW172_200624         | Normal     | EP2006532         | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 288                                     | 288                            | 417          | 415           | 12,600   | 0.26          | 2,700                                            |          | 476                | 644                  | 239                  | 7,640             |     |
|                             |                   | 19/11/2020                  | 0960_MW172_201119         | Normal     | EP2012894         | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 270                                     | 270                            | 407          | 425           | 12,300   | 2.20          | 2,610                                            |          | 482                | 680                  | 259                  | 7,780             |     |
|                             |                   | 23/06/2021                  | 0960_MW172_210623         | Normal     | EP2107189         | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 281                                     | 281                            | 403          | 433           | 12,400   | 3.66          | 2,270                                            |          | 528                | 714                  | 246                  | 7,860             |     |
|                             |                   | 25/11/2021                  | 0960_MW172_211125         | Normal     | EP2114477         | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 287                                     | 287                            | 398          | 394           | 12,000   | 0.56          | 2,610                                            |          | 468                | 646                  | 206                  | 7,180             |     |
|                             |                   | 22/06/2022                  | 0960_MW172_220622         | Normal     | EP2207727         | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 275                                     | 275                            | 361          | 412           | 10,800   | 6.62          | 2,450                                            |          | 499                | 692                  | 269                  | 7,440             |     |
|                             |                   | Site Northern Drainage Chan | MW134                     | 10/03/2018 | 0960_MW134_180310 | Normal                                                             | 208042                                                        | <0.002                                            | <0.005                                                           | <0.05                                                       | <0.002                             | <0.05                                   |                                | 200          |               |          |               | 22,000                                           | 3.7      |                    | 3,800                | 600                  | 1,400             | 520 |
| 10/06/2018                  | 0960_MW134_180610 |                             |                           | Normal     | 211878            | <0.002                                                             | <0.005                                                        | <0.01                                             | <0.002                                                           | <0.05                                                       |                                    | 250                                     |                                |              |               | 21,000   | 1.8           |                                                  | 3,200    | 550                | 1,300                | 450                  | 12,000            |     |
| 29/11/2019                  | 0960_MW134_191129 |                             |                           | Normal     | EP1912673         | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 208                                     | 208                            | 658          | 795           | 20,700   | 9.48          | 3,340                                            |          | 669                | 1,610                | 804                  | 14,000            |     |
| 26/06/2020                  | 0960_MW134_200626 |                             |                           | Normal     | EP2006688         | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 202                                     | 202                            | 654          | 689           | 20,600   | 2.56          | 3,330                                            |          | 598                | 1,370                | 609                  | 12,200            |     |
| 20/11/2020                  | 0960_MW134_201120 |                             |                           | Normal     | EP2012957         | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 179                                     | 179                            | 619          | 668           | 19,600   | 3.83          | 2,990                                            |          | 563                | 1,360                | 574                  | 11,800            |     |
| 24/06/2021                  | 0960_MW134_210624 |                             |                           | Normal     | EP2107273         | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 174                                     | 174                            | 711          | 831           | 22,800   | 7.79          | 3,090                                            |          | 697                | 1,640                | 860                  | 14,700            |     |
| 25/11/2021                  | 0960_MW134_211125 |                             |                           | Normal     | EP2114477         | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 182                                     | 182                            | 670          | 725           | 21,200   | 3.88          | 3,310                                            |          | 572                | 1,430                | 679                  | 12,900            |     |
| 23/06/2022                  | 0960_MW134_230623 |                             |                           | Normal     | EP2207810         | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 168                                     | 168                            | 727          | 701           | 23,100   | 1.78          | 3,450                                            |          | 594                | 1,440                | 712                  | 12,300            |     |
| Site Northern Drainage Chan | MW135             | 8/03/2018                   | 0960_MW135_2.5-3.0_180308 | Normal     | 208042            | <0.002                                                             | <0.005                                                        | <0.05                                             | <0.002                                                           | <0.05                                                       |                                    | 250                                     |                                |              |               | 11,000   | -0.82         |                                                  | 1,900    | 400                | 680                  | 230                  | 6,100             |     |
|                             |                   | 8/03/2018                   | 0960_MW135_4.5-5.0_180308 | Normal     | 208042            | <0.002                                                             | <0.005                                                        | <0.05                                             | <0.002                                                           | <0.05                                                       |                                    | 220                                     |                                |              |               | 14,000   | 0.99          |                                                  | 2,200    | 500                | 870                  | 270                  | 7,800             |     |
|                             |                   | 8/03/2018                   | 0960_MW135_6.5-7.0_180308 | Normal     | 208042            | <0.002                                                             | <0.005                                                        | <0.05                                             | <0.002                                                           | <0.05                                                       |                                    | 210                                     |                                |              |               | 15,000   | 2.6           |                                                  | 2,300    | 500                | 960                  | 310                  | 8,700             |     |
|                             |                   | 8/03/2018                   | 0960_MW135_9.0-9.5_180308 | Normal     | 208042            | <0.002                                                             | <0.005                                                        | <0.05                                             | <0.002                                                           | <0.05                                                       |                                    | 210                                     |                                |              |               | 14,000   | 2.4           |                                                  | 2,300    | 450                | 910                  | 280                  | 8,300             |     |
|                             |                   | 16/06/2018                  | 0960_MW135_3.0_180616     | Normal     | 212372            | <0.002                                                             | <0.005                                                        | <0.01                                             | <0.002                                                           | <0.05                                                       |                                    | 300                                     |                                |              |               | 10,000   | 8.8           |                                                  | 1,600    | 340                | 690                  | 250                  | 7,200             |     |
|                             |                   | 16/06/2018                  | 0960_MW135_5.0_180616     | Normal     | 212372            | <0.002                                                             | <0.005                                                        | <0.01                                             | <0.002                                                           | <0.05                                                       |                                    | 240                                     |                                |              |               | 14,000   | 2.1           |                                                  | 2,000    | 440                | 860                  | 270                  | 8,000             |     |
|                             |                   | 16/06/2018                  | 0960_MW135_7.0_180616     | Normal     | 212372            | <0.002                                                             | <0.005                                                        | <0.01                                             | <0.002                                                           | <0.05                                                       |                                    | 230                                     |                                |              |               | 16,000   | 2.2           |                                                  | 2,300    | 450                | 1,000                | 320                  | 9,300             |     |
|                             |                   | 16/06/2018                  | 0960_MW135_9.5_180616     | Normal     | 212372            | <0.002                                                             | <0.005                                                        | <0.01                                             | <0.002                                                           | <0.05                                                       |                                    | 190                                     |                                |              |               | 18,000   | 0.47          |                                                  | 2,500    | 490                | 1,100                | 330                  | 10,000            |     |
|                             |                   | 29/11/2019                  | 0960_MW135_2.5-3.0_191129 | Normal     | EP1912673         | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 333                                     | 333                            | 322          | 347           | 10,1     |               |                                                  |          |                    |                      |                      |                   |     |

Table 1 - Water Analytical Results

|                               |       |                               |                           |           |                           | PFAS - Perfluoroalkyl Sulfonamides                        |                                                      |                                             |                                                         |                                                    | Inorganics                      |                                   |                             |              |               |          |               |                                            |          |                    |                      |                      |                   |     |        |
|-------------------------------|-------|-------------------------------|---------------------------|-----------|---------------------------|-----------------------------------------------------------|------------------------------------------------------|---------------------------------------------|---------------------------------------------------------|----------------------------------------------------|---------------------------------|-----------------------------------|-----------------------------|--------------|---------------|----------|---------------|--------------------------------------------|----------|--------------------|----------------------|----------------------|-------------------|-----|--------|
|                               |       |                               |                           |           |                           | N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA) | N-methyl perfluorooctane sulfonamidoethanol (MeFOSE) | N-Ethyl perfluorooctane sulfonamide (EFOSA) | N-Ethyl perfluorooctane sulfonamidoacetic acid (EFOSAA) | N-Ethyl perfluorooctane sulfonamidoethanol (EFOSE) | Carbonate Alkalinity (as CaCO3) | Alkalinity (Bicarbonate as CaCO3) | Alkalinity (total) as CaCO3 | Anions Total | Cations Total | Chloride | Ionic Balance | Sulphate as SO4 - Turbidimetric (filtered) | Sulphate | Calcium (filtered) | Magnesium (filtered) | Potassium (filtered) | Sodium (filtered) |     |        |
|                               |       |                               |                           |           |                           | µg/L                                                      | µg/L                                                 | µg/L                                        | µg/L                                                    | µg/L                                               | mg/L                            | mg/L                              | mg/L                        | meq/L        | meq/L         | mg/L     | %             | mg/L                                       | mg/L     | mg/L               | mg/L                 | mg/L                 | mg/L              |     |        |
| F-site Area west of Wapet Cre | MW144 | 16/06/2018                    | 0960_MW144_7.5_180616     | Normal    | 212372                    | <0.002                                                    | <0.005                                               | <0.01                                       | <0.002                                                  | <0.05                                              |                                 | 230                               |                             |              |               | 21,000   | 10            |                                            | 3,600    | 820                | 1,600                | 510                  | 15,000            |     |        |
|                               |       | 16/06/2018                    | 0960_MW144_9.5_180616     | Normal    | 212372                    | <0.002                                                    | <0.005                                               | <0.01                                       | <0.002                                                  | <0.05                                              |                                 | 210                               |                             |              |               | 26,000   | 10            |                                            | 3,800    | 820                | 1,900                | 610                  | 18,000            |     |        |
|                               |       | 29/11/2019                    | 0960_MW144_3.0-3.5_191129 | Normal    | EP1912673                 | <0.02                                                     | <0.05                                                | <0.05                                       | <0.02                                                   | <0.05                                              | <1                              | 182                               | 182                         | 416          | 464           | 12,300   | 5.38          | 3,160                                      |          | 768                | 1,020                | 478                  | 7,570             |     |        |
|                               |       | 25/06/2020                    | 0960_MW144_200625         | Normal    | EP2006590                 | <0.02                                                     | <0.05                                                | <0.05                                       | <0.02                                                   | <0.05                                              | <1                              | 188                               | 188                         | 427          | 424           | 12,700   | 0.38          | 3,130                                      |          | 731                | 871                  | 458                  | 6,990             |     |        |
|                               |       | 20/11/2020                    | 0960_MW144_201120         | Normal    | EP2012943                 | <0.02                                                     | <0.05                                                | <0.05                                       | <0.02                                                   | <0.05                                              | <1                              | 181                               | 181                         | 452          | 422           | 13,300   | 3.35          | 3,500                                      |          | 739                | 916                  | 459                  | 6,860             |     |        |
|                               |       | 24/06/2021                    | 0960_MW144_210624         | Normal    | EP2107273                 | <0.02                                                     | <0.05                                                | <0.05                                       | <0.02                                                   | <0.05                                              | <1                              | 184                               | 184                         | 430          | 440           | 13,000   | 1.17          | 2,850                                      |          | 813                | 959                  | 470                  | 7,090             |     |        |
|                               |       | 24/11/2021                    | 0960_MW144_3-3.5_211124   | Normal    | EP2114392                 | <0.02                                                     | <0.05                                                | <0.05                                       | <0.02                                                   | <0.05                                              | <1                              | 184                               | 184                         | 383          | 410           | 11,200   | 3.41          | 3,030                                      |          | 767                | 887                  | 393                  | 6,630             |     |        |
|                               |       | 22/06/2022                    | 0960_MW144_3-3.5_220622   | Normal    | EP2207731                 | <0.02                                                     | <0.05                                                | <0.05                                       | <0.02                                                   | <0.05                                              | <1                              | 207                               | 207                         | 432          | 430           | 12,800   | 0.26          | 3,220                                      |          | 773                | 925                  | 474                  | 6,970             |     |        |
| F-site Area west of Wapet Cre | MW145 | 12/03/2018                    | 0960_MW145_3.0-3.5_180312 | Normal    | 208042                    | <0.002                                                    | <0.005                                               | <0.05                                       | <0.002                                                  | <0.05                                              |                                 | 140                               |                             |              |               | 38,000   | 3.9           |                                            | 5,700    | 990                | 2,400                | 810                  | 23,000            |     |        |
|                               |       | 12/03/2018                    | 0960_MW145_5.0-5.5_180312 | Normal    | 208042                    | <0.002                                                    | <0.005                                               | <0.05                                       | <0.002                                                  | <0.05                                              |                                 | 140                               |                             |              |               | 41,000   | -0.75         |                                            | 6,300    | 1,200              | 2,500                | 820                  | 23,000            |     |        |
|                               |       | 12/03/2018                    | 0960_MW145_7.0-7.5_180312 | Normal    | 208042                    | <0.002                                                    | <0.005                                               | <0.05                                       | <0.002                                                  | <0.05                                              |                                 | 150                               |                             |              |               | 41,000   | 1.3           |                                            | 6,400    | 1,200              | 2,500                | 840                  | 24,000            |     |        |
|                               |       | 12/03/2018                    | 0960_MW145_9.0-9.5_180312 | Normal    | 208042                    | <0.002                                                    | <0.005                                               | <0.05                                       | <0.002                                                  | <0.05                                              |                                 | 150                               |                             |              |               | 43,000   | 0.5           |                                            | 6,500    | 1,100              | 2,600                | 850                  | 24,000            |     |        |
|                               |       | 16/06/2018                    | 0960_MW145_3.5_180616     | Normal    | 212372                    | <0.002                                                    | <0.005                                               | <0.01                                       | <0.002                                                  | <0.05                                              |                                 | 130                               |                             |              |               | 39,000   | 11            |                                            | 5,300    | 1,100              | 2,800                | 940                  | 27,000            |     |        |
|                               |       | 16/06/2018                    | 0960_MW145_5.5_180616     | Normal    | 212372                    | <0.002                                                    | <0.005                                               | <0.01                                       | <0.002                                                  | <0.05                                              |                                 | 160                               |                             |              |               | 42,000   | 7.1           |                                            | 5,500    | 1,100              | 2,800                | 940                  | 27,000            |     |        |
|                               |       | 16/06/2018                    | 0960_MW145_7.5_180616     | Normal    | 212372                    | <0.002                                                    | <0.005                                               | <0.01                                       | <0.002                                                  | <0.05                                              |                                 | 160                               |                             |              |               | 43,000   | 3.8           |                                            | 5,500    | 1,100              | 2,600                | 910                  | 26,000            |     |        |
|                               |       | 16/06/2018                    | 0960_MW145_9.5_180616     | Normal    | 212372                    | <0.002                                                    | <0.005                                               | <0.01                                       | <0.002                                                  | <0.05                                              |                                 | 170                               |                             |              |               | 43,000   | 5.4           |                                            | 5,700    | 1,100              | 2,800                | 960                  | 27,000            |     |        |
|                               |       | 29/11/2019                    | 0960_MW145_5.0-5.5_191129 | Normal    | EP1912678                 | <0.02                                                     | <0.05                                                | <0.05                                       | <0.02                                                   | <0.05                                              | <1                              | 205                               | 205                         | 1,200        | 1,410         | 38,300   | 8.12          | 5,320                                      |          | 1,260              | 3,000                | 1,390                | 24,400            |     |        |
|                               |       | 24/06/2020                    | 0960_MW145_200624         | Normal    | EP2006516                 | <0.02                                                     | <0.05                                                | <0.05                                       | <0.02                                                   | <0.05                                              | <1                              | 123                               | 123                         | 1,080        | 1,270         | 34,600   | 8.04          | 4,940                                      |          | 1,040              | 2,690                | 1,060                | 22,300            |     |        |
|                               |       | 20/11/2020                    | 0960_MW145_201120         | Normal    | EP2012943                 | <0.02                                                     | <0.05                                                | <0.05                                       | <0.02                                                   | <0.05                                              | <1                              | 118                               | 118                         | 1,230        | 1,490         | 39,000   | 9.77          | 5,980                                      |          | 1,260              | 3,150                | 1,210                | 26,200            |     |        |
|                               |       | 24/06/2021                    | 0960_MW145_210624         | Normal    | EP2107273                 | <0.02                                                     | <0.05                                                | <0.05                                       | <0.02                                                   | <0.05                                              | <1                              | 126                               | 126                         | 1,290        | 1,430         | 41,700   | 5.24          | 5,300                                      |          | 1,180              | 3,000                | 1,170                | 25,200            |     |        |
| F-site Area west of Wapet Cre | MW146 | 24/11/2021                    | 0960_MW145_5-5.5_211124   | Normal    | EP2114394                 | <0.02                                                     | <0.05                                                | <0.05                                       | <0.02                                                   | <0.05                                              | <1                              | 123                               | 123                         | 1,140        | 1,310         | 36,400   | 7.00          | 5,390                                      |          | 1,080              | 2,780                | 1,180                | 23,000            |     |        |
|                               |       | 22/06/2022                    | 0960_MW145_3-3.5_220622   | Normal    | EP2207731                 | <0.02                                                     | <0.05                                                | <0.05                                       | <0.02                                                   | <0.05                                              | <1                              | 130                               | 130                         | 1,350        | 1,340         | 43,300   | 0.17          | 5,950                                      |          | 1,100              | 2,940                | 1,120                | 23,400            |     |        |
|                               |       | 8/03/2018                     | 0960_MW146_3.0-3.5_180308 | Normal    | 208042                    | <0.002                                                    | <0.005                                               | <0.05                                       | <0.002                                                  | <0.05                                              |                                 | 140                               |                             |              |               | 34,000   | 4             |                                            | 5,600    | 1,100              | 2,300                | 740                  | 21,000            |     |        |
|                               |       | 8/03/2018                     | 0960_MW146_5.0-5.5_180308 | Normal    | 208042                    | <0.002                                                    | <0.005                                               | <0.05                                       | <0.002                                                  | <0.05                                              |                                 | 160                               |                             |              |               | 36,000   | 5.2           |                                            | 6,000    | 1,200              | 2,400                | 740                  | 23,000            |     |        |
|                               |       | 8/03/2018                     | 0960_MW146_7.0-7.5_180308 | Normal    | 208042                    | <0.002                                                    | <0.005                                               | <0.05                                       | <0.002                                                  | <0.05                                              |                                 | 170                               |                             |              |               | 38,000   | 8.8           |                                            | 6,000    | 1,300              | 2,700                | 850                  | 25,000            |     |        |
|                               |       | 8/03/2018                     | 0960_MW146_9.0-9.5_180308 | Normal    | 208042                    | <0.002                                                    | <0.005                                               | <0.05                                       | <0.002                                                  | <0.05                                              |                                 | 160                               |                             |              |               | 42,000   | 4.7           |                                            | 6,600    | 1,200              | 2,800                | 930                  | 26,000            |     |        |
|                               |       | 16/06/2018                    | 0960_MW146_3.5_180616     | Normal    | 212372                    | <0.002                                                    | <0.005                                               | <0.01                                       | <0.002                                                  | <0.05                                              |                                 | 180                               |                             |              |               | 36,000   | 3.0           |                                            | 5,200    | 960                | 2,300                | 720                  | 22,000            |     |        |
|                               |       | 16/06/2018                    | 0960_MW146_5.5_180616     | Normal    | 212372                    | <0.002                                                    | <0.005                                               | <0.01                                       | <0.002                                                  | <0.05                                              |                                 | 160                               |                             |              |               | 38,000   | 3.4           |                                            | 5,400    | 990                | 2,400                | 770                  | 23,000            |     |        |
| F-site Area west of Wapet Cre | MW147 | 16/06/2018                    | 0960_MW146_7.5_180616     | Normal    | 212372                    | <0.002                                                    | <0.005                                               | <0.01                                       | <0.002                                                  | <0.05                                              |                                 | 240                               |                             |              |               | 44,000   | 4.4           |                                            | 6,200    | 1,200              | 2,800                | 900                  | 27,000            |     |        |
|                               |       | 16/06/2018                    | 0960_MW146_9.5_180616     | Normal    | 212372                    | <0.002                                                    | <0.005                                               | <0.01                                       | <0.002                                                  | <0.05                                              |                                 | 160                               |                             |              |               | 46,000   | 2.1           |                                            | 6,400    | 1,100              | 2,800                | 940                  | 27,000            |     |        |
|                               |       | 29/11/2019                    | 0960_MW146_5.0-5.5_191129 | Normal    | EP1912678                 | <0.02                                                     | <0.05                                                | <0.05                                       | <0.02                                                   | <0.05                                              | <1                              | 140                               | 140                         | 1,160        | 1,400         | 36,700   | 9.09          | 5,990                                      |          | 1,200              | 3,010                | 1,370                | 24,200            |     |        |
|                               |       | 24/06/2020                    | 0960_MW146_200624         | Normal    | EP2006516                 | <0.02                                                     | <0.05                                                | <0.05                                       | <0.02                                                   | <0.05                                              | <1                              | 142                               | 142                         | 1,120        | 1,290         | 35,700   | 6.82          | 5,520                                      |          | 1,050              | 2,760                | 1,050                | 22,600            |     |        |
|                               |       | 21/11/2020                    | 0960_MW146_5.0_201121     | Normal    | EP2013115                 | <0.02                                                     | <0.05                                                | <0.05                                       | <0.02                                                   | <0.05                                              | <1                              | 128                               | 128                         | 1,200        | 1,380         | 37,800   | 7.06          | 6,130                                      |          | 1,130              | 3,020                | 1,150                | 24,000            |     |        |
|                               |       | 24/06/2021                    | 0960_MW146_210624         | Normal    | EP2107276                 | <0.02                                                     | <0.05                                                | <0.05                                       | <0.02                                                   | <0.05                                              | <1                              | 128                               | 128                         | 1,190        | 1,280         | 38,400   | 3.69          | 4,900                                      |          | 1,080              | 2,750                | 1,290                | 22,200            |     |        |
|                               |       | 24/11/2021                    | 0960_MW146_3-3.5_211124   | Normal    | EP2114394                 | <0.02                                                     | <0.05                                                | <0.05                                       | <0.02                                                   | <0.05                                              | <1                              | 128                               | 128                         | 1,110        | 1,330         | 35,100   | 8.83          | 5,800                                      |          | 1,060              | 2,810                | 1,060                | 23,400            |     |        |
|                               |       | 22/06/2022                    | 0960_MW146_3-3.5_220622   | Normal    | EP2207731                 | <0.02                                                     | <0.05                                                | <0.05                                       | <0.02                                                   | <0.05                                              | <1                              | 133                               | 133                         | 1,310        | 1,340         | 41,800   | 1.32          | 6,000                                      |          | 1,110              | 2,910                | 1,130                | 23,400            |     |        |
|                               |       | F-site Area west of Wapet Cre | MW147                     | 8/03/2018 | 0960_MW147_3.0-3.5_180308 | Normal                                                    | 208042                                               | <0.002                                      | <0.005                                                  | <0.05                                              | <0.002                          | <0.05                             |                             | 150          |               |          |               | 39,000                                     | 4.9      |                    | 6,600                | 1,400                | 2,800             | 870 | 24,000 |
|                               |       |                               |                           | 8/03/2018 | 0960_MW147_5.0-5.5_180308 | Normal                                                    | 208042                                               | <0.002                                      | <0.005                                                  | <0.05                                              | <0.002                          | <0.05                             |                             | 180          |               |          |               | 40,000                                     | 1.9      |                    | 6,300                | 1,100                | 2,600             | 800 | 23,000 |
|                               |       |                               |                           | 8/03/2018 | 0960_MW147_7.0-7.5_180308 | Normal                                                    | 208042                                               | <0.002                                      | <0.005                                                  | <0.05                                              | <0.002                          | <0.05                             |                             | 190          |               |          |               | 40,000                                     |          |                    |                      |                      |                   |     |        |



|                   |        |            |                           |        |           | PFAS - Perfluoroalkyl Sulfonamides                                |                                                               |                                                   |                                                                 |                                                             | Inorganics                         |                                         |                                |              |               |          |               |                                                  |          |                    |                      |                      |                   |  |
|-------------------|--------|------------|---------------------------|--------|-----------|-------------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------|-----------------------------------------------------------------|-------------------------------------------------------------|------------------------------------|-----------------------------------------|--------------------------------|--------------|---------------|----------|---------------|--------------------------------------------------|----------|--------------------|----------------------|----------------------|-------------------|--|
|                   |        |            |                           |        |           | N-Methyl<br>perfluorooctane<br>sulfonamidoacetic<br>acid (MeFOAA) | N-methyl<br>perfluorooctane<br>sulfonamidoethanol<br>(MeFOSE) | N-Ethyl<br>perfluorooctane<br>sulfonamide (EFOSA) | N-Ethyl<br>perfluorooctane<br>sulfonamidoacetic<br>acid (EFOAA) | N-Ethyl<br>perfluorooctane<br>sulfonamidoethanol<br>(EFOSE) | Carbonate Alkalinity<br>(as CaCO3) | Alkalinity<br>(Bicarbonate as<br>CaCO3) | Alkalinity (total) as<br>CaCO3 | Anions Total | Cations Total | Chloride | Ionic Balance | Sulphate as SO4 -<br>Turbidimetric<br>(filtered) | Sulphate | Calcium (filtered) | Magnesium (filtered) | Potassium (filtered) | Sodium (filtered) |  |
|                   |        |            |                           |        |           | µg/L                                                              | µg/L                                                          | µg/L                                              | µg/L                                                            | µg/L                                                        | mg/L                               | mg/L                                    | mg/L                           | meq/L        | meq/L         | mg/L     | %             | mg/L                                             | mg/L     | mg/L               | mg/L                 | mg/L                 | mg/L              |  |
| Off-site Receptor | MW177  | 17/06/2018 | 0960_MW177_6.5_180617     | Normal | 212372    | <0.002                                                            | <0.005                                                        | <0.01                                             | <0.002                                                          | <0.05                                                       |                                    | 180                                     |                                |              |               | 39,000   | -1.1          |                                                  | 5,400    | 720                | 2,400                | 720                  | 22,000            |  |
|                   |        | 17/06/2018 | 0960_MW177_9.0_180617     | Normal | 212372    | <0.002                                                            | <0.005                                                        | <0.01                                             | <0.002                                                          | <0.05                                                       |                                    | 160                                     |                                |              |               | 40,000   | 4.4           |                                                  | 5,500    | 800                | 2,700                | 820                  | 25,000            |  |
|                   |        | 29/11/2019 | 0960_MW177_1.5-2.0_191129 | Normal | EP1912673 | <0.02                                                             | <0.05                                                         | <0.05                                             | <0.02                                                           | <0.05                                                       | <1                                 | 240                                     | 240                            | 790          | 943           | 25,100   | 8.81          | 3,730                                            |          | 783                | 2,140                | 912                  | 16,200            |  |
|                   |        | 24/06/2020 | 0960_MW177_200624         | Normal | EP2006524 | <0.02                                                             | <0.05                                                         | <0.05                                             | <0.02                                                           | <0.05                                                       | <1                                 | 270                                     | 270                            | 893          | 932           | 28,700   | 2.16          | 3,740                                            |          | 761                | 2,110                | 795                  | 16,100            |  |
|                   |        | 20/11/2020 | 0960_MW177_201120         | Normal | EP2012946 | <0.02                                                             | <0.05                                                         | <0.05                                             | <0.02                                                           | <0.05                                                       | <1                                 | 204                                     | 204                            | 1,050        | 1,120         | 34,200   | 3.30          | 4,010                                            |          | 890                | 2,460                | 1,140                | 19,500            |  |
|                   |        | 23/06/2021 | 0960_MW177_3.5-4.0_210623 | Normal | EP2107272 | <0.02                                                             | <0.05                                                         | <0.05                                             | <0.02                                                           | <0.05                                                       | <1                                 | 193                                     | 193                            | 938          | 1,100         | 30,200   | 8.11          | 3,930                                            |          | 872                | 2,440                | 925                  | 19,200            |  |
|                   |        | 24/11/2021 | 0960_MW177_3.5-4_211124   | Normal | EP2114392 | <0.02                                                             | <0.05                                                         | <0.05                                             | <0.02                                                           | <0.05                                                       | <1                                 | 136                                     | 136                            | 1,080        | 1,220         | 34,600   | 6.22          | 4,900                                            |          | 838                | 2,640                | 995                  | 21,600            |  |
|                   |        | 23/06/2022 | 0960_MW177_1.5-2_220623   | Normal | EP2207814 | <0.02                                                             | <0.05                                                         | <0.05                                             | <0.02                                                           | <0.05                                                       | <1                                 | 162                                     | 162                            | 1,220        | 1,240         | 39,800   | 0.91          | 4,610                                            |          | 982                | 2,840                | 1,030                | 21,500            |  |
| Off-site Receptor | MW178  | 17/06/2018 | 0960_MW178_2.5_180617     | Normal | 212372    | <0.002                                                            | <0.005                                                        | <0.01                                             | <0.002                                                          | <0.05                                                       |                                    | 160                                     |                                |              |               | 38,000   | 4.5           |                                                  | 5,500    | 1,100              | 2,400                | 780                  | 23,000            |  |
|                   |        | 17/06/2018 | 0960_MW178_4.5_180617     | Normal | 212372    | <0.002                                                            | <0.005                                                        | <0.01                                             | <0.002                                                          | <0.05                                                       |                                    | 170                                     |                                |              |               | 37,000   | 3.7           |                                                  | 5,500    | 1,200              | 2,300                | 680                  | 23,000            |  |
|                   |        | 17/06/2018 | 0960_MW178_7.5_180617     | Normal | 212372    | <0.002                                                            | <0.005                                                        | <0.01                                             | <0.002                                                          | <0.05                                                       |                                    | 150                                     |                                |              |               | 37,000   | 0.16          |                                                  | 5,400    | 1,100              | 2,100                | 670                  | 21,000            |  |
|                   |        | 17/06/2018 | 0960_MW178_9.5_180617     | Normal | 212372    | <0.002                                                            | <0.005                                                        | <0.01                                             | <0.002                                                          | <0.05                                                       |                                    | 170                                     |                                |              |               | 38,000   | 3.5           |                                                  | 5,600    | 1,000              | 2,400                | 780                  | 23,000            |  |
|                   |        | 29/11/2019 | 0960_MW178_4.0-4.5_191129 | Normal | EP1912673 | <0.02                                                             | <0.05                                                         | <0.05                                             | <0.02                                                           | <0.05                                                       | <1                                 | 149                                     | 149                            | 1,010        | 1,140         | 32,000   | 5.98          | 5,220                                            |          | 1,140              | 2,500                | 1,100                | 19,600            |  |
|                   |        | 24/06/2020 | 0960_MW178_200624         | Normal | EP2006524 | <0.02                                                             | <0.05                                                         | <0.05                                             | <0.02                                                           | <0.05                                                       | <1                                 | 157                                     | 157                            | 1,030        | 1,090         | 32,500   | 2.98          | 5,120                                            |          | 1,040              | 2,440                | 920                  | 18,700            |  |
|                   |        | 20/11/2020 | 0960_MW178_201120         | Normal | EP2012943 | <0.02                                                             | <0.05                                                         | <0.05                                             | <0.02                                                           | <0.05                                                       | <1                                 | 128                                     | 128                            | 1,050        | 1,300         | 33,000   | 10.6          | 5,730                                            |          | 1,230              | 2,800                | 1,060                | 22,600            |  |
|                   |        | 24/06/2021 | 0960_MW178_210624         | Normal | EP2107273 | <0.02                                                             | <0.05                                                         | <0.05                                             | <0.02                                                           | <0.05                                                       | <1                                 | 121                                     | 121                            | 1,050        | 1,260         | 33,400   | 9.10          | 4,960                                            |          | 1,160              | 2,680                | 1,040                | 21,900            |  |
|                   |        | 24/11/2021 | 0960_MW178_9-9.5_211124   | Normal | EP2114392 | <0.02                                                             | <0.05                                                         | <0.05                                             | <0.02                                                           | <0.05                                                       | <1                                 | 128                                     | 128                            | 1,050        | 1,240         | 33,500   | 8.04          | 5,080                                            |          | 1,140              | 2,620                | 996                  | 21,600            |  |
|                   |        | 23/06/2022 | 0960_MW178_2-2.5_220623   | Normal | EP2207814 | <0.02                                                             | <0.05                                                         | <0.05                                             | <0.02                                                           | <0.05                                                       | <1                                 | 147                                     | 147                            | 1,300        | 1,340         | 41,600   | 1.56          | 6,010                                            |          | 1,240              | 2,960                | 1,100                | 23,200            |  |
| Off-site Receptor | MW179  | 16/06/2018 | 0960_MW179_1.5_180616     | Normal | 212372    | <0.002                                                            | <0.005                                                        | <0.01                                             | <0.002                                                          | <0.05                                                       |                                    | 170                                     |                                |              |               | 31,000   | 6.7           |                                                  | 4,500    | 890                | 2,100                | 630                  | 20,000            |  |
|                   |        | 16/06/2018 | 0960_MW179_3.7_180616     | Normal | 212372    | <0.002                                                            | <0.005                                                        | <0.01                                             | <0.002                                                          | <0.05                                                       |                                    | 200                                     |                                |              |               | 30,000   | 3.2           |                                                  | 3,900    | 630                | 1,900                | 620                  | 18,000            |  |
|                   |        | 16/06/2018 | 0960_MW179_6.4_180616     | Normal | 212372    | <0.002                                                            | <0.005                                                        | <0.01                                             | <0.002                                                          | <0.05                                                       |                                    | 210                                     |                                |              |               | 30,000   | 5.4           |                                                  | 4,000    | 650                | 2,000                | 650                  | 19,000            |  |
|                   |        | 16/06/2018 | 0960_MW179_9.0_180616     | Normal | 212372    | <0.002                                                            | <0.005                                                        | <0.01                                             | <0.002                                                          | <0.05                                                       |                                    | 280                                     |                                |              |               |          |               |                                                  |          | 690                | 2,000                | 650                  | 19,000            |  |
|                   |        | 29/11/2019 | 0960_MW179_3.2-3.7_191129 | Normal | EP1912678 | <0.02                                                             | <0.05                                                         | <0.05                                             | <0.02                                                           | <0.05                                                       | <1                                 | 144                                     | 144                            | 877          | 1,010         | 27,900   | 6.95          | 4,170                                            |          | 826                | 2,300                | 965                  | 17,300            |  |
|                   |        | 24/06/2020 | 0960_MW179_200624         | Normal | EP2006523 | <0.02                                                             | <0.05                                                         | <0.05                                             | <0.02                                                           | <0.05                                                       | <1                                 | 200                                     | 200                            | 918          | 969           | 29,600   | 2.72          | 3,780                                            |          | 674                | 2,240                | 789                  | 16,800            |  |
|                   |        | 20/11/2020 | 0960_MW179_201120         | Normal | EP2012943 | <0.02                                                             | <0.05                                                         | <0.05                                             | <0.02                                                           | <0.05                                                       | <1                                 | 169                                     | 169                            | 940          | 1,070         | 29,900   | 6.64          | 4,500                                            |          | 745                | 2,390                | 1,060                | 18,700            |  |
|                   |        | 24/06/2021 | 0960_MW179_210624         | Normal | EP2107273 | <0.02                                                             | <0.05                                                         | <0.05                                             | <0.02                                                           | <0.05                                                       | <1                                 | 171                                     | 171                            | 891          | 1,040         | 28,800   | 7.59          | 3,600                                            |          | 695                | 2,290                | 871                  | 18,200            |  |
|                   |        | 24/11/2021 | 0960_MW179_3.2-3.7_211124 | Normal | EP2114394 | <0.02                                                             | <0.05                                                         | <0.05                                             | <0.02                                                           | <0.05                                                       | <1                                 | 176                                     | 176                            | 877          | 1,020         | 28,000   | 7.75          | 4,000                                            |          | 662                | 2,240                | 922                  | 18,000            |  |
|                   |        | 22/06/2022 | 0960_MW179_1-1.5_220622   | Normal | EP2207737 | <0.02                                                             | <0.05                                                         | <0.05                                             | <0.02                                                           | <0.05                                                       | <1                                 | 184                                     | 184                            | 1,080        | 1,090         | 35,300   | 0.20          | 4,140                                            |          | 676                | 2,430                | 994                  | 19,100            |  |
| Seepage Water     | OTH103 | 1/03/2018  | 0960_OTH103_180301        | Normal | 207735    | <0.002                                                            | <0.005                                                        | <0.01                                             | <0.002                                                          | <0.05                                                       |                                    | 450                                     |                                |              |               | 21,000   | -0.75         |                                                  | 3,300    | 430                | 1,400                | 420                  | 12,000            |  |
|                   |        | 10/06/2018 | 0960_OTH103_180610_A      | Normal | 211878    | <0.002                                                            | <0.005                                                        | <0.01                                             | <0.002                                                          | <0.05                                                       |                                    | 470                                     |                                |              |               | 20,000   | 0.38          |                                                  |          | 420                | 1,300                | 390                  | 11,000            |  |
|                   |        | 10/06/2018 | 0960_OTH103_180610_B      | Normal | 211878    | <0.002                                                            | <0.005                                                        | <0.01                                             | <0.002                                                          | <0.05                                                       |                                    | 210                                     |                                |              |               | 20,000   | 0.96          |                                                  | 2,700    | 430                | 1,300                | 390                  | 11,000            |  |
|                   |        | 1/12/2019  | 0960_OTH103_191201        | Normal | EP1912685 | <0.02                                                             | <0.05                                                         | <0.05                                             | <0.02                                                           | <0.05                                                       | <1                                 | 121                                     | 121                            | 635          | 790           | 20,400   | 10.9          | 2,740                                            |          | 525                | 1,810                | 754                  | 13,700            |  |
|                   |        | 25/06/2020 | 0960_OTH103_200625        | Normal | EP2006595 | <0.02                                                             | <0.05                                                         | <0.05                                             | <0.02                                                           | <0.05                                                       | <1                                 | 128                                     | 128                            | 623          | 665           | 19,900   | 3.27          | 2,840                                            |          | 463                | 1,500                | 548                  | 11,600            |  |
|                   |        | 20/11/2020 | 0960_OTH103_201120        | Normal | EP2012946 | <0.02                                                             | <0.05                                                         | <0.05                                             | <0.02                                                           | <0.05                                                       | <1                                 | 131                                     | 131                            | 712          | 691           | 23,000   | 1.44          | 2,890                                            |          | 487                | 1,590                | 560                  | 12,000            |  |
|                   |        | 23/06/2021 | 0960_OTH103_210623        | Normal | EP2107272 | <0.02                                                             | <0.05                                                         | <0.05                                             | <0.02                                                           | <0.05                                                       | <1                                 | 132                                     | 132                            | 637          | 696           | 20,600   | 4.42          | 2,560                                            |          | 490                | 1,560                | 657                  | 12,100            |  |
|                   |        | 24/11/2021 | 0960_OTH103_211124        | Normal | EP2114392 | <0.02                                                             | <0.05                                                         | <0.05                                             | <0.02                                                           | <0.05                                                       | 4                                  | 121                                     | 125                            | 589          | 656           | 18,900   | 5.41          | 2,560                                            |          | 468                | 1,480                | 596                  | 11,400            |  |
|                   |        | 23/06/2022 | 0960_OTH103_220623        | Normal | EP2207816 | <0.02                                                             | <0.05                                                         | <0.05                                             | <0.02                                                           | <0.05                                                       | <1                                 | 150                                     | 150                            | 571          | 682           | 18,300   | 8.86          | 2,480                                            |          | 505                | 1,590                | 661                  | 11,700            |  |
|                   |        | 28/02/2018 | 0960_OTH106_180228        | Normal | 207735    | <0.002                                                            | <0.005                                                        | <0.01                                             | <0.002                                                          | <0.05                                                       |                                    | 420                                     |                                |              |               | 21,000   | -0.33         |                                                  | 3,400    | 440                | 1,400                | 420                  | 12,000            |  |
|                   | OTH106 | 9/06/2018  | 0960_OTH106_180609_A      | Normal | 211878    | <0.002                                                            | <0.005                                                        | <0.01                                             | <0.002                                                          | <0.05                                                       |                                    | 370                                     |                                |              |               | 20,000   | 1.5           |                                                  | 2,700    | 430                |                      |                      |                   |  |



|                           |                   |            |                   |        |           | PFAS - Perfluoroalkyl Sulfonamides                                 |                                                               |                                                   |                                                                  |                                                             |                                    | Inorganics                              |                                |              |               |          |               |                                                  |          |                    |                      |                      |                   |  |  |  |
|---------------------------|-------------------|------------|-------------------|--------|-----------|--------------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------|------------------------------------------------------------------|-------------------------------------------------------------|------------------------------------|-----------------------------------------|--------------------------------|--------------|---------------|----------|---------------|--------------------------------------------------|----------|--------------------|----------------------|----------------------|-------------------|--|--|--|
|                           |                   |            |                   |        |           | N-Methyl<br>perfluorooctane<br>sulfonamidoacetic<br>acid (MeFOSAA) | N-methyl<br>perfluorooctane<br>sulfonamidoethanol<br>(MeFOSE) | N-Ethyl<br>perfluorooctane<br>sulfonamide (EFOSA) | N-Ethyl<br>perfluorooctane<br>sulfonamidoacetic<br>acid (EFOSAA) | N-Ethyl<br>perfluorooctane<br>sulfonamidoethanol<br>(EFOSE) | Carbonate Alkalinity<br>(as CaCO3) | Alkalinity<br>(Bicarbonate as<br>CaCO3) | Alkalinity (total) as<br>CaCO3 | Anions Total | Cations Total | Chloride | Ionic Balance | Sulphate as SO4 -<br>Turbidimetric<br>(filtered) | Sulphate | Calcium (filtered) | Magnesium (filtered) | Potassium (filtered) | Sodium (filtered) |  |  |  |
|                           |                   |            |                   |        |           | µg/L                                                               | µg/L                                                          | µg/L                                              | µg/L                                                             | µg/L                                                        | mg/L                               | mg/L                                    | mg/L                           | meq/L        | meq/L         | mg/L     | %             | mg/L                                             | mg/L     | mg/L               | mg/L                 | mg/L                 | mg/L              |  |  |  |
| Northern Drainage Channel | SW220             | 17/05/2022 | 0960_SW190_220517 | Normal | EP2205925 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 70                                      | 70                             | 51.8         | 48.4          | 1,620    | 3.38          | 226                                              |          | 52                 | 99                   | 53                   | 835               |  |  |  |
|                           |                   | 23/06/2022 | 0960_SW190_220623 | Normal | EP2207812 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | 2                                  | 98                                      | 100                            | 10.4         | 9.12          | 251      | 6.43          | 62                                               |          | 32                 | 18                   | 15                   | 130               |  |  |  |
| Central Drainage Channel  | SW192             | 18/05/2022 | 0960_SW192_220518 | Normal | EP2205970 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 113                                     | 113                            | 458          | 398           | 14,700   | 6.94          | 1,970                                            |          | 303                | 953                  | 359                  | 6,800             |  |  |  |
|                           |                   | 23/06/2022 | 0960_SW192_220623 | Normal | EP2207816 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 102                                     | 102                            | 90.3         | 92.2          | 2,840    | 1.07          | 390                                              |          | 80                 | 201                  | 99                   | 1,590             |  |  |  |
| Northern Drainage Channel | SW193             | 28/05/2020 | 0960_SW193_200528 | Normal | EP2005558 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 85                                      | 85                             | 360          | 370           | 11,600   | 1.32          | 1,520                                            |          | 287                | 836                  | 357                  | 6,390             |  |  |  |
|                           |                   | 25/06/2020 | 0960_SW193_200625 | Normal | EP2006596 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 168                                     | 168                            | 724          | 798           | 23,100   | 4.81          | 3,330                                            |          | 603                | 1,840                | 616                  | 13,800            |  |  |  |
|                           |                   | 4/03/2021  | 0960_SW193_210304 | Normal | EP2102258 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 63                                      | 63                             | 2.38         | 2.68          | 25       | 5.88          | 20                                               |          | 20                 | 3                    | 5                    | 30                |  |  |  |
|                           |                   | 23/06/2021 | 0960_SW193_210623 | Normal | EP2107270 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 163                                     | 163                            | 545          | 560           | 17,600   | 1.35          | 2,160                                            |          | 404                | 1,270                | 510                  | 9,700             |  |  |  |
|                           |                   | 18/05/2022 | 0960_SW193_220518 | Normal | EP2205970 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 116                                     | 116                            | 506          | 446           | 16,200   | 6.34          | 2,260                                            |          | 330                | 1,060                | 404                  | 7,630             |  |  |  |
|                           |                   | 23/06/2022 | 0960_SW193_220623 | Normal | EP2207816 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 93                                      | 93                             | 21.6         | 18.8          | 638      | 6.71          | 82                                               |          | 35                 | 38                   | 26                   | 306               |  |  |  |
| Southern Drainage Channel | SW199             | 26/05/2020 | 0960_SW199_200526 | Normal | EP2005408 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 91                                      | 91                             | 2.20         | 2.50          | 13       | 6.18          | 1                                                |          | 28                 | 4                    | 8                    | 13                |  |  |  |
|                           |                   | 4/03/2021  | 0960_SW199_210304 | Normal | EP2102262 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 68                                      | 68                             | 1.47         | 1.66          | 4        | 5.91          | <1                                               |          | 24                 | 2                    | 3                    | 5                 |  |  |  |
|                           |                   | 22/06/2022 | 0960_SW199_220622 | Normal | EP2207732 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 128                                     | 128                            | 2.64         | 2.55          | 3        | 1.72          | <1                                               |          | 38                 | 4                    | 6                    | 4                 |  |  |  |
| Southern Drainage Channel | SW200             | 19/02/2018 | 0960_SW200_180219 | Normal | 207115    | <0.002                                                             | <0.005                                                        | <0.01                                             | <0.002                                                           | <0.05                                                       |                                    | 110                                     |                                |              |               | 93       | -4.4          |                                                  | 34       | 18                 | 4.4                  | 10                   | 82                |  |  |  |
|                           |                   | 4/03/2021  | 0960_SW200_210304 | Normal | EP2102262 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 51                                      | 51                             | 1.12         | 1.31          | 2        | 8.07          | 2                                                |          | 20                 | 1                    | 4                    | 3                 |  |  |  |
|                           |                   | 24/06/2021 | 0960_SW200_210624 | Normal | EP2107281 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 81                                      | 81                             | 3.56         | 3.96          | 65       | 5.32          | 5                                                |          | 20                 | 5                    | 6                    | 55                |  |  |  |
| 22/06/2022                | 0960_SW200_220622 | Normal     | EP2207732         | <0.02  | <0.05     | <0.05                                                              | <0.02                                                         | <0.05                                             | <1                                                               | 67                                                          | 67                                 | 1.46                                    | 1.30                           | 2            | 5.88          | 3        |               | 18                                               | 2        | 4                  | 3                    |                      |                   |  |  |  |
| WAPET Creek south         | SW205             | 19/02/2018 | 0960_SW205_180219 | Normal | 207115    | <0.002                                                             | <0.005                                                        | <0.01                                             | <0.002                                                           | <0.05                                                       |                                    | 280                                     |                                |              |               | 29,000   | 1.3           |                                                  | 4,600    | 610                | 1,900                | 560                  | 17,000            |  |  |  |
|                           |                   | 14/06/2018 | 0960_SW205_180614 | Normal | 212372    | <0.002                                                             | <0.005                                                        | <0.01                                             | <0.002                                                           | <0.05                                                       |                                    | 310                                     |                                |              |               | 27,000   | 8.0           |                                                  | 3,800    | 630                | 2,000                | 590                  | 18,000            |  |  |  |
|                           |                   | 27/05/2020 | 0960_SW205_200527 | Normal | EP2005487 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 157                                     | 157                            | 609          | 705           | 19,400   | 7.29          | 2,830                                            |          | 562                | 1,570                | 675                  | 12,200            |  |  |  |
|                           |                   | 24/06/2020 | 0960_SW205_200624 | Normal | EP2006551 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 279                                     | 279                            | 811          | 941           | 25,800   | 7.45          | 3,710                                            |          | 651                | 2,060                | 664                  | 16,600            |  |  |  |
|                           |                   | 20/11/2020 | 0960_SW205_201120 | Normal | EP2013114 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 190                                     | 190                            | 991          | 1,180         | 31,200   | 8.91          | 5,130                                            |          | 919                | 2,620                | 1,230                | 20,500            |  |  |  |
|                           |                   | 4/03/2021  | 0960_SW205_210304 | Normal | EP2102258 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 106                                     | 106                            | 580          | 680           | 18,400   | 7.91          | 2,830                                            |          | 488                | 1,520                | 667                  | 11,800            |  |  |  |
|                           |                   | 24/06/2021 | 0960_SW205_210624 | Normal | EP2107278 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 206                                     | 206                            | 692          | 840           | 22,200   | 9.71          | 2,940                                            |          | 600                | 1,890                | 771                  | 14,600            |  |  |  |
|                           |                   | 25/11/2021 | 0960_SW205_211125 | Normal | EP2114473 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       |                                    |                                         |                                |              |               |          |               |                                                  |          |                    |                      |                      |                   |  |  |  |
|                           |                   | 17/05/2022 | 0960_SW205_220517 | Normal | EP2205925 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 162                                     | 162                            | 644          | 644           | 20,600   | 0.03          | 2,850                                            |          | 473                | 1,490                | 585                  | 11,100            |  |  |  |
|                           |                   | 23/06/2022 | 0960_SW205_220623 | Normal | EP2207812 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 278                                     | 278                            | 746          | 781           | 23,600   | 2.32          | 3,570                                            |          | 531                | 1,810                | 719                  | 13,500            |  |  |  |
| WAPET Creek south         | SW207             | 28/02/2018 | 0960_SW207_180228 | Normal | 207735    | <0.002                                                             | <0.005                                                        | <0.01                                             | <0.002                                                           | <0.05                                                       |                                    | 150                                     |                                |              |               | 21,000   | 4.1           |                                                  | 3,400    | 490                | 1,500                | 460                  | 13,000            |  |  |  |
|                           |                   | 13/06/2018 | 0960_SW207_180613 | Normal | 212151    | <0.002                                                             | <0.005                                                        | <0.01                                             | <0.002                                                           | <0.05                                                       |                                    | 140                                     |                                |              |               | 23,000   | 2.2           |                                                  | 3,200    | 480                | 1,500                | 450                  | 13,000            |  |  |  |
|                           |                   | 2/12/2019  | 0960_SW207_191202 | Normal | EP1912748 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 188                                     | 188                            | 735          | 977           | 23,600   | 14.1          | 3,160                                            |          | 684                | 2,190                | 909                  | 17,000            |  |  |  |
|                           |                   | 27/05/2020 | 0960_SW207_200527 | Normal | EP2005487 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 161                                     | 161                            | 660          | 797           | 21,000   | 9.40          | 3,090                                            |          | 606                | 1,780                | 774                  | 13,800            |  |  |  |
|                           |                   | 24/06/2020 | 0960_SW207_200624 | Normal | EP2006531 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 129                                     | 129                            | 643          | 723           | 20,600   | 5.83          | 2,850                                            |          | 486                | 1,550                | 552                  | 12,800            |  |  |  |
|                           |                   | 20/11/2020 | 0960_SW207_201120 | Normal | EP2012942 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 122                                     | 122                            | 610          | 704           | 19,400   | 7.15          | 2,880                                            |          | 499                | 1,620                | 572                  | 12,200            |  |  |  |
|                           |                   | 4/03/2021  | 0960_SW207_210304 | Normal | EP2102262 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 111                                     | 111                            | 623          | 662           | 19,900   | 3.08          | 2,850                                            |          | 475                | 1,480                | 655                  | 11,500            |  |  |  |
|                           |                   | 24/06/2021 | 0960_SW207_210624 | Normal | EP2107278 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 134                                     | 134                            | 672          | 803           | 21,500   | 8.85          | 3,040                                            |          | 585                | 1,780                | 718                  | 14,000            |  |  |  |
|                           |                   | 24/11/2021 | 0960_SW207_211124 | Normal | EP2114399 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 170                                     | 170                            | 671          | 757           | 21,400   | 6.02          | 3,060                                            |          | 542                | 1,680                | 672                  | 13,200            |  |  |  |
|                           |                   | 25/11/2021 | 0960_SW207_211125 | Normal | EP2114473 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                                 | 138                                     | 138                            | 607          | 704           | 19,400   | 7.45          | 2,720                                            |          | 487                | 1,570                | 618                  | 12,300            |  |  |  |
| 18/05/2022                | 0960_SW207_220518 | Normal     | EP2205970         | <0.02  | <0.05     | <0.05                                                              | <0.02                                                         | <0.05                                             | <1                                                               | 111                                                         | 111                                | 616                                     | 554                            | 19,800       | 5.29          | 2,670    |               | 408                                              | 1,300    | 488                | 9,530                |                      |                   |  |  |  |
| 23/06/2022                | 0960_SW207_220623 | Normal     | EP2207812         | <0.02  | <0.05     | <0.05                                                              | <0.02                                                         | <0.05                                             | <1                                                               | 185                                                         | 185                                | 573                                     | 636                            | 18,200       | 5.27          | 2,670    |               | 481                                              | 1,490    | 612                | 10,900               |                      |                   |  |  |  |
| WAPET Creek south         | SW208             | 1/03/2018  | 0960_SW208_180301 | Normal | 207735    | <0.002                                                             | <0.005                                                        | <0.01                                             | <0.002                                                           | <0.05                                                       |                                    | 120                                     |                                |              |               | 20,000   | 4.2           | </                                               |          |                    |                      |                      |                   |  |  |  |

|                   |                   |            |                   |        |           | PFAS - Perfluoroalkyl Sulfonamides                                 |                                                               |                                                   |                                                                  |                                                             | Inorganics                       |                                       |                                |              |               |          |               |                                                  |          |                    |                      |                      |                   |  |
|-------------------|-------------------|------------|-------------------|--------|-----------|--------------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------|------------------------------------------------------------------|-------------------------------------------------------------|----------------------------------|---------------------------------------|--------------------------------|--------------|---------------|----------|---------------|--------------------------------------------------|----------|--------------------|----------------------|----------------------|-------------------|--|
|                   |                   |            |                   |        |           | N-Methyl<br>perfluorooctane<br>sulfonamidoacetic<br>acid (MeFOSAA) | N-methyl<br>perfluorooctane<br>sulfonamidoethanol<br>(MeFOSE) | N-Ethyl<br>perfluorooctane<br>sulfonamide (EFOSA) | N-Ethyl<br>perfluorooctane<br>sulfonamidoacetic<br>acid (EFOSAA) | N-Ethyl<br>perfluorooctane<br>sulfonamidoethanol<br>(EFOSE) | Carbonate Alkalinity<br>as CaCO3 | Alkalinity<br>Bicarbonate as<br>CaCO3 | Alkalinity (total) as<br>CaCO3 | Anions Total | Cations Total | Chloride | Ionic Balance | Sulphate as SO4 -<br>Turbidimetric<br>(filtered) | Sulphate | Calcium (filtered) | Magnesium (filtered) | Potassium (filtered) | Sodium (filtered) |  |
|                   |                   |            |                   |        |           | µg/L                                                               | µg/L                                                          | µg/L                                              | µg/L                                                             | µg/L                                                        | mg/L                             | mg/L                                  | mg/L                           | meq/L        | meq/L         | mg/L     | %             | mg/L                                             | mg/L     | mg/L               | mg/L                 | mg/L                 | mg/L              |  |
|                   |                   | 23/06/2021 | 0960_SW300_210623 | Normal | EP2107270 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                               | 236                                   | 236                            | 581          | 599           | 18,600   | 1.56          | 2,460                                            |          | 430                | 1,360                | 519                  | 10,400            |  |
|                   |                   | 24/11/2021 | 0960_SW300_211124 | Normal | EP2114398 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                               | 248                                   | 248                            | 1,150        | 1,300         | 36,800   | 6.20          | 5,150                                            |          | 872                | 2,880                | 1,010                | 22,900            |  |
|                   |                   | 18/05/2022 | 0960_SW300_220518 | Normal | EP2205970 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                               | 211                                   | 211                            | 645          | 619           | 20,500   | 2.04          | 3,000                                            |          | 499                | 1,450                | 539                  | 10,600            |  |
|                   |                   | 23/06/2022 | 0960_SW300_220623 | Normal | EP2207816 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                               | 220                                   | 220                            | 357          | 387           | 11,200   | 4.02          | 1,760                                            |          | 311                | 914                  | 354                  | 6,600             |  |
|                   |                   | 20/06/2018 | 0960_SW301_180620 | Normal | 212572    | <0.002                                                             | <0.005                                                        | <0.01                                             | <0.002                                                           | <0.05                                                       |                                  | 190                                   |                                |              |               | 19,000   | 0.35          |                                                  | 3,000    | 500                | 1,200                | 330                  | 11,000            |  |
|                   |                   | 24/06/2021 | 0960_SW301_210624 | Normal | EP2107278 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                               | 186                                   | 186                            | 724          | 885           | 23,100   | 10.0          | 3,280                                            |          | 686                | 1,950                | 807                  | 15,400            |  |
| WAPET creek north | SW301             | 25/11/2021 | 0960_SW301_211125 | Normal | EP2114473 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                               | 186                                   | 186                            | 1,120        | 1,110         | 35,900   | 0.43          | 5,190                                            |          | 707                | 2,560                | 976                  | 19,400            |  |
|                   |                   | 17/05/2022 | 0960_SW301_220517 | Normal | EP2205925 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                               | 182                                   | 182                            | 672          | 632           | 21,500   | 2.99          | 2,950                                            |          | 474                | 1,460                | 572                  | 10,900            |  |
|                   |                   | 23/06/2022 | 0960_SW301_220623 | Normal | EP2207812 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                               | 205                                   | 205                            | 1,120        | 1,090         | 35,800   | 1.02          | 4,920                                            |          | 777                | 2,560                | 1,040                | 18,800            |  |
|                   |                   | 20/06/2018 | 0960_SW302_180620 | Normal | 212572    | <0.002                                                             | <0.005                                                        | <0.01                                             | <0.002                                                           | <0.05                                                       |                                  | 280                                   |                                |              |               | 24,000   | -0.41         |                                                  | 3,300    | 470                | 1,500                | 450                  | 14,000            |  |
|                   |                   | 2/12/2019  | 0960_SW302_191202 | Normal | EP1912743 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                               | 178                                   | 178                            | 796          | 966           | 25,600   | 9.67          | 3,360                                            |          | 669                | 2,120                | 901                  | 16,900            |  |
|                   |                   | 26/05/2020 | 0960_SW302_200526 | Normal | EP2005408 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                               | 119                                   | 119                            | 495          | 539           | 15,900   | 4.25          | 2,120                                            |          | 414                | 1,200                | 519                  | 9,340             |  |
| WAPET creek north | SW302             | 24/06/2020 | 0960_SW302_200624 | Normal | EP2006531 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                               | 183                                   | 183                            | 678          | 745           | 21,700   | 4.69          | 2,990                                            |          | 508                | 1,590                | 561                  | 13,200            |  |
|                   |                   | 20/11/2020 | 0960_SW302_201120 | Normal | EP2012942 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                               | 154                                   | 154                            | 720          | 796           | 22,900   | 4.99          | 3,410                                            |          | 567                | 1,830                | 644                  | 13,800            |  |
|                   |                   | 4/03/2021  | 0960_SW302_210304 | Normal | EP2102262 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                               | 127                                   | 127                            | 424          | 438           | 13,600   | 1.63          | 1,840                                            |          | 347                | 970                  | 458                  | 7,580             |  |
|                   |                   | 24/06/2021 | 0960_SW302_210624 | Normal | EP2107274 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                               | 224                                   | 224                            | 596          | 602           | 19,300   | 0.49          | 2,270                                            |          | 450                | 1,380                | 533                  | 10,400            |  |
|                   |                   | 24/11/2021 | 0960_SW302_211124 | Normal | EP2114399 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                               | 184                                   | 184                            | 789          | 964           | 25,100   | 9.99          | 3,730                                            |          | 648                | 2,120                | 885                  | 16,900            |  |
|                   |                   | 18/05/2022 | 0960_SW302_220518 | Normal | EP2205970 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                               | 159                                   | 159                            | 625          | 545           | 20,000   | 6.83          | 2,750                                            |          | 409                | 1,280                | 479                  | 9,350             |  |
| 22/06/2022        | 0960_SW302_220622 | Normal     | EP2207739         | <0.02  | <0.05     | <0.05                                                              | <0.02                                                         | <0.05                                             | <1                                                               | 151                                                         | 151                              | 354                                   | 346                            | 11,400       | 1.16          | 1,400    |               | 274                                              | 814      | 359                | 5,880                |                      |                   |  |
| WAPET creek north | SW303             | 20/06/2018 | 0960_SW303_180620 | Normal | 212572    | <0.002                                                             | <0.005                                                        | <0.01                                             | <0.002                                                           | <0.05                                                       |                                  | 48                                    |                                |              |               | 140      | -2.2          |                                                  | 31       | 17                 | 11                   | 6.0                  | 80                |  |
|                   |                   | 2/12/2019  | 0960_SW303_191202 | Normal | EP1912743 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                               | 208                                   | 208                            | 751          | 914           | 23,800   | 9.74          | 3,640                                            |          | 630                | 2,050                | 850                  | 15,900            |  |
|                   |                   | 26/05/2020 | 0960_SW303_200526 | Normal | EP2005408 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                               | 112                                   | 112                            | 479          | 514           | 15,400   | 3.58          | 2,020                                            |          | 398                | 1,150                | 492                  | 8,900             |  |
|                   |                   | 24/06/2020 | 0960_SW303_200624 | Normal | EP2006531 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                               | 133                                   | 133                            | 639          | 713           | 20,500   | 5.46          | 2,780                                            |          | 477                | 1,540                | 550                  | 12,600            |  |
|                   |                   | 20/11/2020 | 0960_SW303_201120 | Normal | EP2012947 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                               | 172                                   | 172                            | 659          | 693           | 21,000   | 2.51          | 3,030                                            |          | 493                | 1,600                | 568                  | 12,000            |  |
|                   |                   | 4/03/2021  | 0960_SW303_210304 | Normal | EP2102258 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                               | 109                                   | 109                            | 578          | 669           | 18,400   | 7.29          | 2,740                                            |          | 485                | 1,500                | 665                  | 11,600            |  |
| WAPET creek north | SW303             | 23/06/2021 | 0960_SW303_210623 | Normal | EP2107270 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                               | 215                                   | 215                            | 571          | 594           | 18,400   | 1.97          | 2,290                                            |          | 441                | 1,340                | 534                  | 10,300            |  |
|                   |                   | 24/11/2021 | 0960_SW303_211124 | Normal | EP2114399 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                               | 207                                   | 207                            | 730          | 886           | 23,200   | 9.66          | 3,430                                            |          | 620                | 1,950                | 798                  | 15,500            |  |
|                   |                   | 18/05/2022 | 0960_SW303_220518 | Normal | EP2205970 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                               | 157                                   | 157                            | 624          | 563           | 20,000   | 5.08          | 2,700                                            |          | 420                | 1,330                | 494                  | 9,660             |  |
|                   |                   | 23/06/2022 | 0960_SW303_220623 | Normal | EP2207816 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                               | 174                                   | 174                            | 332          | 318           | 10,500   | 2.13          | 1,530                                            |          | 266                | 761                  | 304                  | 5,380             |  |
|                   |                   | 20/06/2018 | 0960_SW304_180620 | Normal | 212572    | <0.002                                                             | <0.005                                                        | <0.01                                             | <0.002                                                           | <0.05                                                       |                                  | 52                                    |                                |              |               | 150      | -3.4          |                                                  | 33       | 18                 | 10                   | 6.2                  | 81                |  |
|                   |                   | 26/05/2020 | 0960_SW304_200526 | Normal | EP2005408 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                               | 136                                   | 136                            | 585          | 680           | 18,800   | 7.51          | 2,490                                            |          | 509                | 1,510                | 660                  | 11,800            |  |
| WAPET creek north | SW304             | 24/06/2020 | 0960_SW304_200624 | Normal | EP2006551 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                               | 226                                   | 226                            | 676          | 735           | 21,600   | 4.16          | 3,000                                            |          | 516                | 1,570                | 568                  | 13,000            |  |
|                   |                   | 20/11/2020 | 0960_SW304_201120 | Normal | EP2012947 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                               | 149                                   | 149                            | 705          | 790           | 22,400   | 5.67          | 3,370                                            |          | 568                | 1,810                | 646                  | 13,700            |  |
|                   |                   | 4/03/2021  | 0960_SW304_210304 | Normal | EP2102258 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                               | 115                                   | 115                            | 579          | 658           | 18,400   | 6.35          | 2,770                                            |          | 485                | 1,470                | 645                  | 11,400            |  |
|                   |                   | 23/06/2021 | 0960_SW304_210623 | Normal | EP2107270 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                               | 214                                   | 214                            | 571          | 599           | 18,400   | 2.44          | 2,280                                            |          | 442                | 1,350                | 538                  | 10,400            |  |
|                   |                   | 24/11/2021 | 0960_SW304_211124 | Normal | EP2114398 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                               | 252                                   | 252                            | 752          | 857           | 24,000   | 6.56          | 3,340                                            |          | 629                | 1,870                | 760                  | 15,000            |  |
|                   |                   | 18/05/2022 | 0960_SW304_220518 | Normal | EP2205970 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                               | 150                                   | 150                            | 618          | 558           | 19,800   | 5.16          | 2,730                                            |          | 414                | 1,310                | 490                  | 9,580             |  |
| 23/06/2022        | 0960_SW304_220623 | Normal     | EP2207816         | <0.02  | <0.05     | <0.05                                                              | <0.02                                                         | <0.05                                             | <1                                                               | 215                                                         | 215                              | 357                                   | 392                            | 11,300       | 4.61          | 1,650    |               | 332                                              | 935      | 375                | 6,640                |                      |                   |  |
| WAPET Creek south | SW305             | 14/06/2018 | 0960_SW305_180614 | Normal | 212372    | <0.002                                                             | <0.005                                                        | <0.01                                             | <0.002                                                           | <0.05                                                       |                                  | 130                                   |                                |              |               | 21,000   | -0.21         |                                                  | 2,800    | 390                | 1,300                | 390                  | 12,000            |  |
|                   |                   | 26/05/2020 | 0960_SW305_200526 | Normal | EP2005408 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                               | 125                                   | 125                            | 532          | 572           | 17,100   | 3.66          | 2,260                                            |          | 438                | 1,280                | 550                  | 9,910             |  |
|                   |                   | 24/06/2020 | 0960_SW305_200624 | Normal | EP2006550 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                               | 131                                   | 131                            | 638          | 668           | 20,500   | 2.30          | 2,730                                            |          | 455                | 1,440                | 521                  | 11,800            |  |
|                   |                   | 20/11/2020 | 0960_SW305_201120 | Normal | EP2012947 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                               | 138                                   | 138                            | 736          | 821           | 23,500   | 5.46          | 3,370                                            |          | 576                | 1,910                | 671                  | 14,200            |  |
|                   |                   | 4/03/2021  | 0960_SW305_210304 | Normal | EP2102262 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                               | 104                                   | 104                            | 419          | 442           | 13,400   | 2.61          | 1,890                                            |          | 364                | 967                  | 464                  | 7,640             |  |
|                   |                   | 23/06/2021 | 0960_SW305_210623 | Normal | EP2107270 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                               | 149                                   | 149                            | 642          | 684           | 20,700   | 3.22          | 2,640                                            |          | 486                | 1,540                | 624                  | 11,900            |  |
|                   |                   | 24/11/2021 | 0960_SW305_211124 | Normal | EP2114398 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                               | 203                                   | 203                            | 693          | 796           | 22,200   | 6.90          | 3,020                                            |          | 573                | 1,760                | 701                  | 13,900            |  |
|                   |                   | 18/05/2022 | 0960_SW305_220518 | Normal | EP2205970 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                               | 150                                   | 150                            | 610          | 578           | 19,500   | 2.68          | 2,720                                            |          | 430                | 1,360                | 506                  | 9,920             |  |
|                   |                   | 23/06/2022 | 0960_SW305_220623 | Normal | EP2207816 | <0.02                                                              | <0.05                                                         | <0.05                                             | <0.02                                                            | <0.05                                                       | <1                               | 191                                   | 191                            | 367          | 397           | 11,600   | 4.01          | 1,710                                            |          | 332                | 951                  | 379                  | 6,730             |  |

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

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

[illegible]



[illegible]

|                 |       |            |                       |        | PFAS - Perfluoroalkyl Carboxylic Acids |                                          |                                         |                                          |                                        |                                        |                               |                                |                               |                                 | PFAS - (n-2) Fluorotelomer Sulfonic Acids |                               |                               |                                  |                                  |                                      |                                    |                                              |                                             |                                              | PFAS - Perfluoroalkyl Sulfonamides          |                                                |                                               |                      |                         |             |         |         |         |  | PFAS |  |  |
|-----------------|-------|------------|-----------------------|--------|----------------------------------------|------------------------------------------|-----------------------------------------|------------------------------------------|----------------------------------------|----------------------------------------|-------------------------------|--------------------------------|-------------------------------|---------------------------------|-------------------------------------------|-------------------------------|-------------------------------|----------------------------------|----------------------------------|--------------------------------------|------------------------------------|----------------------------------------------|---------------------------------------------|----------------------------------------------|---------------------------------------------|------------------------------------------------|-----------------------------------------------|----------------------|-------------------------|-------------|---------|---------|---------|--|------|--|--|
|                 |       |            |                       |        | Perfluorobutanoic sulfonic acid (PFBS) | Perfluoropentanoic sulfonic acid (PFPeS) | Perfluorohexanoic sulfonic acid (PFHxS) | Perfluoroheptanoic sulfonic acid (PFHpS) | Perfluorooctanoic sulfonic acid (PFOs) | Perfluorodecanoic sulfonic acid (PFDS) | Perfluorobutanoic acid (PFBA) | Perfluoropentanoic acid (PFPA) | Perfluorohexanoic acid (PFHA) | Perfluoroheptanoic acid (PFHPA) | Perfluorooctanoic acid (PFOA)             | Perfluorononanoic acid (PFNA) | Perfluorodecanoic acid (PFDA) | Perfluoroundecanoic acid (PFUDA) | Perfluorododecanoic acid (PFDDA) | Perfluorotetradecanoic acid (PFTeDA) | Perfluorooctanesulfonic acid (FOS) | N-Ethylperfluorooctanesulfonamide (N-EtFOSu) | N-Methylperfluorooctanesulfonamide (MeFOSu) | N-Ethylperfluorodecanesulfonamide (N-EtFDSu) | N-Methylperfluorodecanesulfonamide (MeFDSu) | N-Ethylperfluorododecanesulfonamide (N-EtFDDu) | N-Methylperfluorododecanesulfonamide (MeFDDu) | Sum of PFBS and PFOs | Sum of PFAS (WATER USE) | Sum of PFAS |         |         |         |  |      |  |  |
|                 |       |            |                       |        | mg/kg                                  | mg/kg                                    | mg/kg                                   | mg/kg                                    | mg/kg                                  | mg/kg                                  | mg/kg                         | mg/kg                          | mg/kg                         | mg/kg                           | mg/kg                                     | mg/kg                         | mg/kg                         | mg/kg                            | mg/kg                            | mg/kg                                | mg/kg                              | mg/kg                                        | mg/kg                                       | mg/kg                                        | mg/kg                                       | mg/kg                                          | mg/kg                                         | mg/kg                | mg/kg                   | mg/kg       | mg/kg   | mg/kg   |         |  |      |  |  |
| On-site pathway | SS124 | 25/06/2020 | 0960 SS124_200625     | Normal | EP2006592                              | <0.0002                                  | <0.0002                                 | <0.0002                                  | <0.0002                                | 0.0426                                 | 0.0002                        | <0.0001                        | <0.0002                       | <0.0002                         | <0.0002                                   | 0.0007                        | 0.0007                        | 0.0003                           | 0.0004                           | <0.0002                              | <0.0002                            | <0.0002                                      | <0.0002                                     | <0.0002                                      | <0.0002                                     | <0.0002                                        | <0.0002                                       | <0.0002              | <0.0002                 | <0.0002     | 0.0426  | 0.0426  | 0.0449  |  |      |  |  |
| On-site pathway | SS124 | 19/11/2020 | 0960 SS124_201119     | Normal | EP2012519                              | <0.0002                                  | <0.0002                                 | <0.0002                                  | <0.0002                                | 0.188                                  | 0.0147                        | <0.0001                        | <0.0002                       | 0.0005                          | <0.0002                                   | 0.0004                        | 0.0012                        | 0.0036                           | 0.0017                           | 0.0014                               | 0.0002                             | <0.0002                                      | <0.0002                                     | <0.0002                                      | <0.0002                                     | <0.0002                                        | <0.0002                                       | <0.0002              | <0.0002                 | <0.0002     | 0.188   | 0.190   | 0.212   |  |      |  |  |
| On-site pathway | SS124 | 4/03/2021  | 0960 SS124_210304     | Normal | EP2102259                              | <0.0002                                  | <0.0002                                 | <0.0002                                  | <0.0002                                | 0.0384                                 | 0.0016                        | <0.0001                        | <0.0002                       | <0.0002                         | <0.0002                                   | <0.0002                       | 0.0006                        | 0.0017                           | 0.0012                           | 0.0012                               | 0.0003                             | <0.0002                                      | <0.0002                                     | <0.0002                                      | <0.0002                                     | <0.0002                                        | <0.0002                                       | <0.0002              | <0.0002                 | <0.0002     | 0.0384  | 0.0384  | 0.0450  |  |      |  |  |
| On-site pathway | SS124 | 23/06/2021 | 0960 SS124_210623     | Normal | EP2107198                              | <0.0002                                  | <0.0002                                 | <0.0002                                  | <0.0002                                | 0.0766                                 | 0.0031                        | <0.0001                        | <0.0002                       | <0.0002                         | <0.0002                                   | <0.0002                       | 0.0008                        | 0.0019                           | 0.0007                           | <0.0002                              | <0.0002                            | <0.0002                                      | <0.0002                                     | <0.0002                                      | <0.0002                                     | <0.0002                                        | <0.0002                                       | <0.0002              | <0.0002                 | <0.0002     | 0.0766  | 0.0766  | 0.0839  |  |      |  |  |
| On-site pathway | SS124 | 25/11/2021 | 0960 SS124_211125     | Normal | EP2114476                              | <0.0002                                  | <0.0002                                 | <0.0002                                  | <0.0002                                | 0.241                                  | 0.0118                        | <0.0001                        | <0.0002                       | <0.0002                         | <0.0002                                   | 0.0002                        | 0.0018                        | 0.0041                           | 0.0014                           | 0.0009                               | <0.0002                            | <0.0002                                      | <0.0002                                     | <0.0002                                      | <0.0002                                     | <0.0002                                        | <0.0002                                       | <0.0002              | <0.0002                 | <0.0002     | 0.241   | 0.242   | 0.262   |  |      |  |  |
| On-site pathway | SS124 | 17/05/2022 | 0960 SS124_220517     | Normal | EP2205953                              | <0.0002                                  | <0.0002                                 | <0.0002                                  | <0.0002                                | 0.0022                                 | <0.0002                       | <0.0001                        | <0.0002                       | <0.0002                         | <0.0002                                   | <0.0002                       | <0.0002                       | <0.0002                          | <0.0002                          | <0.0002                              | <0.0002                            | <0.0002                                      | <0.0002                                     | <0.0002                                      | <0.0002                                     | <0.0002                                        | <0.0002                                       | <0.0002              | <0.0002                 | <0.0002     | 0.0022  | 0.0022  | 0.0022  |  |      |  |  |
| On-site pathway | SS124 | 22/06/2022 | 0960 SS124_220622     | Normal | EP2207729                              | <0.0002                                  | <0.0002                                 | <0.0002                                  | <0.0002                                | 0.365                                  | 0.0015                        | <0.0001                        | <0.0002                       | <0.0002                         | <0.0002                                   | <0.0002                       | 0.0028                        | 0.0008                           | 0.0003                           | 0.0002                               | <0.0002                            | <0.0002                                      | <0.0002                                     | <0.0002                                      | <0.0002                                     | <0.0002                                        | <0.0002                                       | <0.0002              | <0.0002                 | <0.0002     | 0.365   | 0.365   | 0.371   |  |      |  |  |
| On-site pathway | SS125 | 23/02/2018 | 0960 SS125_0_0_180223 | Normal | 207454                                 | <0.0001                                  | <0.0001                                 | 0.0001                                   | <0.0001                                | 0.0096                                 | 0.0002                        | <0.0001                        | <0.0002                       | <0.0001                         | <0.0001                                   | <0.0001                       | <0.0001                       | <0.0001                          | <0.0001                          | <0.0001                              | <0.0001                            | <0.0001                                      | <0.0001                                     | <0.0001                                      | <0.0001                                     | <0.0001                                        | <0.0001                                       | <0.0001              | <0.0001                 | <0.0001     | <0.0001 | <0.0001 | <0.0001 |  |      |  |  |
| On-site pathway | SS125 | 23/02/2018 | 0960 SS125_0_4_180223 | Normal | 207454                                 | <0.0001                                  | <0.0001                                 | <0.0001                                  | <0.0001                                | 0.01                                   | 0.0002                        | <0.0001                        | <0.0001                       | <0.0001                         | <0.0001                                   | <0.0001                       | <0.0001                       | <0.0001                          | <0.0001                          | <0.0001                              | <0.0001                            | <0.0001                                      | <0.0001                                     | <0.0001                                      | <0.0001                                     | <0.0001                                        | <0.0001                                       | <0.0001              | <0.0001                 | <0.0001     | <0.0001 | <0.0001 | <0.0001 |  |      |  |  |
| On-site pathway | SS125 | 29/11/2019 | 0960 SS125_191129     | Normal | EP1912674                              | <0.0002                                  | <0.0002                                 | <0.0002                                  | <0.0002                                | 0.0261                                 | <0.0002                       | <0.0001                        | <0.0002                       | <0.0002                         | <0.0002                                   | <0.0002                       | <0.0002                       | <0.0002                          | <0.0002                          | <0.0002                              | <0.0002                            | <0.0002                                      | <0.0002                                     | <0.0002                                      | <0.0002                                     | <0.0002                                        | <0.0002                                       | <0.0002              | <0.0002                 | <0.0002     | 0.0261  | 0.0261  | 0.0261  |  |      |  |  |
| On-site pathway | SS125 | 27/05/2020 | 0960 SS125_200527     | Normal | EP2005481                              | <0.0002                                  | <0.0002                                 | <0.0002                                  | <0.0002                                | 0.0024                                 | <0.0002                       | <0.0001                        | <0.0002                       | <0.0002                         | <0.0002                                   | <0.0002                       | <0.0002                       | <0.0002                          | <0.0002                          | <0.0002                              | <0.0002                            | <0.0002                                      | <0.0002                                     | <0.0002                                      | <0.0002                                     | <0.0002                                        | <0.0002                                       | <0.0002              | <0.0002                 | <0.0002     | 0.0024  | 0.0024  | 0.0024  |  |      |  |  |
| On-site pathway | SS125 | 25/06/2020 | 0960 SS125_200625     | Normal | EP2006592                              | <0.0002                                  | <0.0002                                 | <0.0002                                  | <0.0002                                | 0.0263                                 | <0.0002                       | <0.0001                        | <0.0002                       | <0.0002                         | <0.0002                                   | <0.0002                       | <0.0002                       | <0.0002                          | <0.0002                          | <0.0002                              | <0.0002                            | <0.0002                                      | <0.0002                                     | <0.0002                                      | <0.0002                                     | <0.0002                                        | <0.0002                                       | <0.0002              | <0.0002                 | <0.0002     | 0.0263  | 0.0263  | 0.0263  |  |      |  |  |
| On-site pathway | SS125 | 19/11/2020 | 0960 SS125_201119     | Normal | EP2012519                              | <0.0002                                  | <0.0002                                 | <0.0002                                  | <0.0002                                | 0.141                                  | 0.0018                        | <0.0001                        | <0.0002                       | <0.0002                         | <0.0002                                   | <0.0002                       | <0.0002                       | 0.0004                           | <0.0001                          | <0.0001                              | <0.0002                            | <0.0002                                      | <0.0002                                     | <0.0002                                      | <0.0002                                     | <0.0002                                        | <0.0002                                       | <0.0002              | <0.0002                 | <0.0002     | 0.141   | 0.143   | 0.143   |  |      |  |  |
| On-site pathway | SS125 | 4/03/2021  | 0960 SS125_210304     | Normal | EP2102259                              | <0.0002                                  | <0.0002                                 | <0.0002                                  | <0.0002                                | 0.0507                                 | 0.0008                        | <0.0001                        | <0.0002                       | <0.0002                         | <0.0002                                   | <0.0002                       | <0.0002                       | <0.0002                          | <0.0002                          | <0.0002                              | <0.0002                            | <0.0002                                      | <0.0002                                     | <0.0002                                      | <0.0002                                     | <0.0002                                        | <0.0002                                       | <0.0002              | <0.0002                 | <0.0002     | 0.0507  | 0.0507  | 0.0515  |  |      |  |  |
| On-site pathway | SS125 | 24/06/2021 | 0960 SS125_210624     | Normal | EP2107280                              | <0.0002                                  | <0.0002                                 | <0.0002                                  | <0.0002                                | 0.0152                                 | <0.0002                       | <0.0001                        | <0.0002                       | <0.0002                         | <0.0002                                   | <0.0002                       | <0.0002                       | <0.0002                          | <0.0002                          | <0.0002                              | <0.0002                            | <0.0002                                      | <0.0002                                     | <0.0002                                      | <0.0002                                     | <0.0002                                        | <0.0002                                       | <0.0002              | <0.0002                 | <0.0002     | 0.0152  | 0.0152  | 0.0152  |  |      |  |  |
| On-site pathway | SS125 | 25/11/2021 | 0960 SS125_211125     | Normal | EP2114476                              | <0.0002                                  | <0.0002                                 | <0.0002                                  | <0.0002                                | 0.0020                                 | <0.0002                       | <0.0001                        | <0.0002                       | <0.0002                         | <0.0002                                   | <0.0002                       | <0.0002                       | <0.0002                          | <0.0002                          | <0.0002                              | <0.0002                            | <0.0002                                      | <0.0002                                     | <0.0002                                      | <0.0002                                     | <0.0002                                        | <0.0002                                       | <0.0002              | <0.0002                 | <0.0002     | 0.0020  | 0.0020  | 0.0020  |  |      |  |  |
| On-site pathway | SS125 | 17/05/2022 | 0960 SS125_220517     | Normal | EP2205953                              | <0.0002                                  | <0.0002                                 | <0.0002                                  | <0.0002                                | 0.0005                                 | <0.0002                       | <0.0001                        | <0.0002                       | <0.0002                         | <0.0002                                   | <0.0002                       | <0.0002                       | <0.0002                          | <0.0002                          | <0.0002                              | <0.                                |                                              |                                             |                                              |                                             |                                                |                                               |                      |                         |             |         |         |         |  |      |  |  |



[illegible]

[illegible]

**First Time detect of PFOA or PFHxS+PFOS**

**Environmental Standards**

HEPA, January 2020, PFAS NEMP 2020 Ecological direct exposure

HEPA, January 2020, PFAS NEMP 2020 Ecological indirect exposure

HEPA, January 2020, PFAS NEMP 2020 Industrial/ commercial (HIL D



| Monitoring Date | Monitoring Location | Screen Interval | TOC (mAHD) | Well Depth (m) | SWL (mbTOC) | RWL (mAHD) |
|-----------------|---------------------|-----------------|------------|----------------|-------------|------------|
| 21/02/2018      | MW016               | 3.1 - 6.1       | 4.022      | 6.1            | 3.672       | 0.35       |
| 14/06/2018      | MW016               | 3.1 - 6.1       | 4.022      | 6.1            | 3.664       | 0.358      |
| 2/12/2019       | MW016               | 3.1 - 6.1       | 4.022      | 6.1            | 3.03        | 0.992      |
| 24/06/2020      | MW016               | 3.1 - 6.1       | 4.022      | 6.1            | 3.596       | 0.426      |
| 19/11/2020      | MW016               | 3.1 - 6.1       | 4.022      | 6.1            | 3.873       | 0.149      |
| 23/06/2021      | MW016               | 3.1 - 6.1       | 4.022      | 6.1            | 3.335       | 0.687      |
| 24/11/2021      | MW016               | 3.1 - 6.1       | 4.022      |                |             |            |
| 16/03/2018      | MW018               | 5.5-8.5         | 6.403      | 8.50           | 5.506       | 0.897      |
| 10/06/2018      | MW018               | 5.5-8.5         | 6.403      | 8.50           | 5.49        | 0.913      |
| 26/11/2019      | MW018               | 5.5-8.5         | 6.403      | 8.50           |             |            |
| 24/06/2020      | MW018               | 5.5-8.5         | 6.403      | 8.50           | 5.54        | 0.863      |
| 14/10/2020      | MW018               | 5.5-8.5         | 6.403      | 8.50           | 5.655       | 0.748      |
| 19/11/2020      | MW018               | 5.5-8.5         | 6.403      | 8.50           | 5.7         | 0.703      |
| 23/02/2021      | MW018               | 5.5-8.5         | 6.403      | 8.50           | 5.675       | 0.728      |
| 23/06/2021      | MW018               | 5.5-8.5         | 6.403      | 8.50           | 5.2         | 1.203      |
| 23/11/2021      | MW018               | 5.5-8.5         | 6.403      | 8.50           | 5.448       | 0.955      |
| 25/11/2021      | MW018               | 5.5-8.5         | 6.403      | 8.50           | 5.567       | 0.836      |
| 22/06/2022      | MW018               | 5.5-8.5         | 6.403      | 8.50           | 4.97        | 1.433      |
| 31/10/2022      | MW018               | 5.5-8.5         | 6.403      | 8.50           | 5.16        | 1.243      |
| 6/03/2018       | MW021               | 5.6-8.6         | 6.745      | 8.60           | 5.844       | 0.901      |
| 10/06/2018      | MW021               | 5.6-8.6         | 6.745      | 8.60           | 5.82        | 0.925      |
| 26/11/2019      | MW021               | 5.6-8.6         | 6.745      | 8.60           | 5.9         | 0.845      |
| 24/06/2020      | MW021               | 5.6-8.6         | 6.745      | 8.60           | 5.865       | 0.88       |
| 19/11/2020      | MW021               | 5.6-8.6         | 6.745      | 8.60           |             |            |
| 23/02/2021      | MW021               | 5.6-8.6         | 6.745      | 8.60           | 6.02        | 0.725      |
| 23/06/2021      | MW021               | 5.6-8.6         | 6.745      | 8.60           | 5.521       | 1.224      |
| 23/11/2021      | MW021               | 5.6-8.6         | 6.745      | 8.60           | 5.794       | 0.951      |
| 24/11/2021      | MW021               | 5.6-8.6         | 6.745      | 8.60           | 5.767       | 0.978      |
| 22/06/2022      | MW021               | 5.6-8.6         | 6.745      | 8.60           | 5.35        | 1.395      |
| 31/10/2022      | MW021               | 5.6-8.6         | 6.745      | 8.60           | 5.499       | 1.246      |
| 16/03/2018      | MW102               | 2.5-8.5         | 4.6266     | 8.50           | 4.521       | 0.106      |
| 9/06/2018       | MW102               | 2.5-8.5         | 4.6266     | 8.50           | 4.512       | 0.115      |
| 2/12/2019       | MW102               | 2.5-8.5         | 4.6266     | 8.50           | 4.12        | 0.507      |
| 24/06/2020      | MW102               | 2.5-8.5         | 4.6266     | 8.50           | 4.506       | 0.121      |
| 19/11/2020      | MW102               | 2.5-8.5         | 4.6266     | 8.50           | 4.66        | -0.033     |
| 23/06/2021      | MW102               | 2.5-8.5         | 4.6266     | 8.50           | 4.163       | 0.464      |
| 25/11/2021      | MW102               | 2.5-8.5         | 4.6266     | 8.50           | 4.49        | 0.137      |
| 22/06/2022      | MW102               | 2.5-8.5         | 4.6266     | 8.50           | 3.795       | 0.832      |
| 16/03/2018      | MW103               | 1.0-5.8         | 2.2785     | 5.80           | 2.144       | 0.135      |
| 15/06/2018      | MW103               | 1.0-5.8         | 2.2785     | 5.80           | 2.141       | 0.138      |
| 30/11/2019      | MW103               | 1.0-5.8         | 2.2785     | 5.80           | 2.37        | -0.091     |
| 24/06/2020      | MW103               | 1.0-5.8         | 2.2785     | 5.80           | 2.057       | 0.222      |
| 20/11/2020      | MW103               | 1.0-5.8         | 2.2785     | 5.80           | 2.328       | -0.049     |
| 23/06/2021      | MW103               | 1.0-5.8         | 2.2785     | 5.80           | 1.605       | 0.674      |
| 25/11/2021      | MW103               | 1.0-5.8         | 2.2785     | 5.80           | 2.335       | -0.056     |
| 22/06/2022      | MW103               | 1.0-5.8         | 2.2785     | 5.80           |             |            |
| 16/03/2018      | MW104               | 1.0-6.5         | 2.7256     | 6.50           | 2.572       | 0.154      |
| 14/06/2018      | MW104               | 1.0-6.5         | 2.7256     | 6.50           | 2.56        | 0.166      |
| 29/11/2019      | MW104               | 1.0-6.5         | 2.7256     | 6.50           | 2.7         | 0.026      |
| 24/06/2020      | MW104               | 1.0-6.5         | 2.7256     | 6.50           | 2.498       | 0.228      |
| 19/11/2020      | MW104               | 1.0-6.5         | 2.7256     | 6.50           | 2.45        | 0.276      |
| 23/06/2021      | MW104               | 1.0-6.5         | 2.7256     | 6.50           | 2.133       | 0.593      |
| 25/11/2021      | MW104               | 1.0-6.5         | 2.7256     | 6.50           | 2.59        | 0.136      |
| 22/06/2022      | MW104               | 1.0-6.5         | 2.7256     | 6.50           | 1.425       | 1.301      |
| 16/03/2018      | MW105               | 2.0-8.0         | 3.7272     | 8.00           | 3.421       | 0.306      |
| 13/06/2018      | MW105               | 2.0-8.0         | 3.7272     | 8.00           | 3.4         | 0.327      |
| 29/11/2019      | MW105               | 2.0-8.0         | 3.7272     | 8.00           | 3.54        | 0.187      |
| 2/12/2019       | MW105               | 2.0-8.0         | 3.7272     | 8.00           | 3.5         | 0.227      |
| 18/03/2020      | MW105               | 2.0-8.0         | 3.7272     | 8.00           | 3.71        | 0.017      |
| 25/06/2020      | MW105               | 2.0-8.0         | 3.7272     | 8.00           | 3.372       | 0.355      |
| 19/11/2020      | MW105               | 2.0-8.0         | 3.7272     | 8.00           |             |            |
| 23/06/2021      | MW105               | 2.0-8.0         | 3.7272     | 8.00           | 3.05        | 0.677      |
| 24/11/2021      | MW105               | 2.0-8.0         | 3.7272     | 8.00           | 3.24        | 0.487      |
| 22/06/2022      | MW105               | 2.0-8.0         | 3.7272     | 8.00           | 2.71        | 1.017      |
| 9/03/2018       | MW112               | 3.0-8.0         | 5.1191     | 8.00           | 4.403       | 0.716      |
| 8/06/2018       | MW112               | 3.0-8.0         | 5.1191     | 8.00           | 4.382       | 0.737      |
| 26/11/2019      | MW112               | 3.0-8.0         | 5.1191     | 8.00           | 4.53        | 0.589      |
| 25/06/2020      | MW112               | 3.0-8.0         | 5.1191     | 8.00           | 4.39        | 0.729      |
| 19/11/2020      | MW112               | 3.0-8.0         | 5.1191     | 8.00           | 4.55        | 0.569      |
| 24/06/2021      | MW112               | 3.0-8.0         | 5.1191     | 8.00           | 4.054       | 1.065      |
| 25/11/2021      | MW112               | 3.0-8.0         | 5.1191     | 8.00           | 4.316       | 0.803      |

| Monitoring Date | Monitoring Location | Screen Interval | TOC (mAHD) | Well Depth (m) | SWL (mbTOC) | RWL (mAHD) |
|-----------------|---------------------|-----------------|------------|----------------|-------------|------------|
| 22/06/2022      | MW112               | 3.0-8.0         | 5.1191     | 8.00           | 3.88        | 1.239      |
| 16/03/2018      | MW113               | 4.0-10.0        | 7.3165     | 10.00          | 6.421       | 0.895      |
| 14/06/2018      | MW113               | 4.0-10.0        | 7.3165     | 10.00          | 6.39        | 0.927      |
| 29/11/2019      | MW113               | 4.0-10.0        | 7.3165     | 10.00          | 6.56        | 0.757      |
| 24/06/2020      | MW113               | 4.0-10.0        | 7.3165     | 10.00          | 6.46        | 0.857      |
| 15/10/2020      | MW113               | 4.0-10.0        | 7.3165     | 10.00          | 6.585       | 0.732      |
| 19/11/2020      | MW113               | 4.0-10.0        | 7.3165     | 10.00          | 6.6         | 0.717      |
| 23/02/2021      | MW113               | 4.0-10.0        | 7.3165     | 10.00          | 6.593       | 0.724      |
| 23/06/2021      | MW113               | 4.0-10.0        | 7.3165     | 10.00          | 6.1         | 1.217      |
| 24/11/2021      | MW113               | 4.0-10.0        | 7.3165     | 10.00          | 6.351       | 0.966      |
| 22/06/2022      | MW113               | 4.0-10.0        | 7.3165     | 10.00          | 5.915       | 1.401      |
| 16/03/2018      | MW114               | 4.0-10.0        | 7.7467     | 10.00          | 6.8         | 0.947      |
| 10/06/2018      | MW114               | 4.0-10.0        | 7.7467     | 10.00          | 6.791       | 0.956      |
| 26/11/2019      | MW114               | 4.0-10.0        | 7.7467     | 10.00          | 6.95        | 0.797      |
| 24/06/2020      | MW114               | 4.0-10.0        | 7.7467     | 10.00          | 6.835       | 0.912      |
| 19/11/2020      | MW114               | 4.0-10.0        | 7.7467     | 10.00          | 7.04        | 0.707      |
| 23/06/2021      | MW114               | 4.0-10.0        | 7.7467     | 10.00          | 6.53        | 1.217      |
| 24/11/2021      | MW114               | 4.0-10.0        | 7.7467     | 10.00          | 6.542       | 1.205      |
| 22/06/2022      | MW114               | 4.0-10.0        | 7.7467     | 10.00          | 6.32        | 1.427      |
| 8/03/2018       | MW115               | 3.0-8.0         | 4.9133     | 8.00           | 4.33        | 0.583      |
| 8/06/2018       | MW115               | 3.0-8.0         | 4.9133     | 8.00           | 4.311       | 0.602      |
| 29/11/2019      | MW115               | 3.0-8.0         | 4.9133     | 8.00           | 4.38        | 0.533      |
| 25/06/2020      | MW115               | 3.0-8.0         | 4.9133     | 8.00           | 4.312       | 0.601      |
| 19/11/2020      | MW115               | 3.0-8.0         | 4.9133     | 8.00           | 4.475       | 0.438      |
| 24/06/2021      | MW115               | 3.0-8.0         | 4.9133     | 8.00           | 3.997       | 0.916      |
| 25/11/2021      | MW115               | 3.0-8.0         | 4.9133     | 8.00           | 4.227       | 0.686      |
| 22/06/2022      | MW115               | 3.0-8.0         | 4.9133     | 8.00           | 3.82        | 1.093      |
| 15/06/2018      | MW122               | 1.7-7.7         | 3.9702     | 7.70           | 3.68        | 0.290      |
| 30/11/2019      | MW122               | 1.7-7.7         | 3.9702     | 7.70           | 3.81        | 0.160      |
| 25/06/2020      | MW122               | 1.7-7.7         | 3.9702     | 7.70           | 3.93        | 0.040      |
| 19/11/2020      | MW122               | 1.7-7.7         | 3.9702     | 7.70           | 3.87        | 0.100      |
| 24/06/2021      | MW122               | 1.7-7.7         | 3.9702     | 7.70           | 3.35        | 0.620      |
| 25/11/2021      | MW122               | 1.7-7.7         | 3.9702     | 7.70           | 3.535       | 0.435      |
| 22/06/2022      | MW122               | 1.7-7.7         | 3.9702     | 7.70           | 3.05        | 0.92       |
| 16/03/2018      | MW124               | 1.0-6.0         | 2.9183     | 6.00           | 3.125       | -0.207     |
| 9/06/2018       | MW124               | 1.0-6.0         | 2.9183     | 6.00           | 2.795       | 0.123      |
| 2/12/2019       | MW124               | 1.0-6.0         | 2.9183     | 6.00           | 2.99        | -0.072     |
| 19/11/2020      | MW124               | 1.0-6.0         | 2.9183     | 6.00           | 2.907       | 0.011      |
| 23/06/2021      | MW124               | 1.0-6.0         | 2.9183     | 6.00           | 2.444       | 0.474      |
| 25/11/2021      | MW124               | 1.0-6.0         | 2.9183     | 6.00           | 2.831       | 0.087      |
| 22/06/2022      | MW124               | 1.0-6.0         | 2.9183     | 6.00           | 1.998       | 0.92       |
| 16/03/2018      | MW126               | 2.0-8.0         | 4.5088     | 8.00           | 4.251       | 0.258      |
| 8/06/2018       | MW126               | 2.0-8.0         | 4.5088     | 8.00           | 4.251       | 0.258      |
| 29/11/2019      | MW126               | 2.0-8.0         | 4.5088     | 8.00           | 5.5         | -0.991     |
| 24/06/2020      | MW126               | 2.0-8.0         | 4.5088     | 8.00           | 4.245       | 0.264      |
| 19/11/2020      | MW126               | 2.0-8.0         | 4.5088     | 8.00           |             |            |
| 23/06/2021      | MW126               | 2.0-8.0         | 4.5088     | 8.00           | 3.95        | 0.559      |
| 25/11/2021      | MW126               | 2.0-8.0         | 4.5088     | 8.00           | 4.09        | 0.419      |
| 22/06/2022      | MW126               | 2.0-8.0         | 4.5088     | 8.00           | 3.64        | 0.869      |
| 16/03/2018      | MW127               | 2.5-8.5         | 5.6238     | 8.50           | 5.291       | 0.333      |
| 8/06/2018       | MW127               | 2.5-8.5         | 5.6238     | 8.50           | 5.315       | 0.309      |
| 29/11/2019      | MW127               | 2.5-8.5         | 5.6238     | 8.50           | 3.88        | 1.744      |
| 25/06/2020      | MW127               | 2.5-8.5         | 5.6238     | 8.50           | 5.32        | 0.304      |
| 19/11/2020      | MW127               | 2.5-8.5         | 5.6238     | 8.50           | 5.29        | 0.334      |
| 23/06/2021      | MW127               | 2.5-8.5         | 5.6238     | 8.50           | 4.85        | 0.774      |
| 25/11/2021      | MW127               | 2.5-8.5         | 5.6238     | 8.50           | 4.86        | 0.764      |
| 22/06/2022      | MW127               | 2.5-8.5         | 5.6238     | 8.50           | 4.75        | 0.874      |
| 16/03/2018      | MW134               | 1.0-5.7         | 2.5155     | 5.70           | 2.256       | 0.260      |
| 10/06/2018      | MW134               | 1.0-5.7         | 2.5155     | 5.70           | 2.221       | 0.295      |
| 29/11/2019      | MW134               | 1.0-5.7         | 2.5155     | 5.70           |             |            |
| 26/06/2020      | MW134               | 1.0-5.7         | 2.5155     | 5.70           | 2.164       | 0.352      |
| 20/11/2020      | MW134               | 1.0-5.7         | 2.5155     | 5.70           | 2.4         | 0.116      |
| 24/06/2021      | MW134               | 1.0-5.7         | 2.5155     | 5.70           | 1.76        | 0.756      |
| 25/11/2021      | MW134               | 1.0-5.7         | 2.5155     | 5.70           | 2.226       | 0.290      |
| 23/06/2022      | MW134               | 1.0-5.7         | 2.5155     | 5.70           | 1.33        | 1.185      |

| Monitoring Date | Monitoring Location | Screen Interval | TOC (mAHD) | Well Depth (m) | SWL (mbTOC) | RWL (mAHD) |
|-----------------|---------------------|-----------------|------------|----------------|-------------|------------|
| 8/03/2018       | MW135               | 9.0-9.5         | 2.7884     | 9.50           | 2.445       | 0.343      |
| 8/03/2018       | MW135               | 2.5-3.0         | 2.7781     | 3.00           | 2.37        | 0.408      |
| 8/03/2018       | MW135               | 4.5-5.0         | 2.7828     | 5.00           | 2.392       | 0.391      |
| 8/03/2018       | MW135               | 6.5-7.0         | 2.7858     | 7.00           | 2.377       | 0.409      |
| 16/06/2018      | MW135               | 6.5-7.0         | 2.7858     | 7.00           | 2.34        | 0.446      |
| 16/06/2018      | MW135               | 9.0-9.5         | 2.7884     | 9.50           | 2.345       | 0.443      |
| 16/06/2018      | MW135               | 2.5-3.0         | 2.7781     | 3.00           | 2.338       | 0.440      |
| 16/06/2018      | MW135               | 4.5-5.0         | 2.7828     | 5.00           | 2.338       | 0.445      |
| 29/11/2019      | MW135               | 2.5-3.0         | 2.7781     | 3.00           | 2.47        | 0.308      |
| 25/06/2020      | MW135               | 2.5-3.0         | 2.7781     | 3.00           | 2.25        | 0.528      |
| 21/11/2020      | MW135               | 2.5-3.0         | 2.7781     | 3.00           | 2.535       | 0.243      |
| 24/06/2021      | MW135               | 2.5-3.0         | 2.7781     | 3.00           | 1.945       | 0.833      |
| 24/11/2021      | MW135               | 6.5-7.0         | 2.7858     | 7.00           | 2.49        | 0.296      |
| 23/06/2022      | MW135               | 2.5-3.0         | 2.7781     | 3.00           | 1.61        | 1.168      |
| 16/06/2018      | MW137               | 6.5-7.0         | 2.2034     | 7.00           | 1.29        | 0.913      |
| 16/06/2018      | MW137               | 0.8-1.3         | 2.1687     | 1.30           | 1.338       | 0.831      |
| 16/06/2018      | MW137               | 2.5-3.0         | 2.1691     | 3.00           | 1.351       | 0.818      |
| 16/06/2018      | MW137               | 4.5-5.0         | 2.2017     | 5.00           | 1.31        | 0.892      |
| 29/11/2019      | MW137               | 4.5-5.0         | 2.2017     | 5.00           | 1.91        | 0.292      |
| 24/06/2020      | MW137               | 2.5-3.0         | 2.1691     | 3.00           | 1.52        | 0.649      |
| 20/11/2020      | MW137               | 2.5-3.0         | 2.1691     | 3.00           | 1.74        | 0.429      |
| 24/06/2021      | MW137               | 2.5-3.0         | 2.1691     | 3.00           | 1.257       | 0.912      |
| 24/11/2021      | MW137               | 2.5-3.0         | 2.1691     | 3.00           | 1.501       | 0.668      |
| 22/06/2022      | MW137               | 0.8-1.3         | 2.1687     | 1.30           | 0.94        | 1.229      |
| 12/03/2018      | MW138               | 9.0-9.5         | 3.3224     | 9.50           | 3.303       | 0.019      |
| 12/03/2018      | MW138               | 3.0-3.5         | 3.3074     | 3.50           | 3.16        | 0.147      |
| 12/03/2018      | MW138               | 5.0-5.5         | 3.3166     | 5.50           | 3.195       | 0.122      |
| 12/03/2018      | MW138               | 7.0-7.5         | 3.3205     | 7.50           | 3.287       | 0.034      |
| 16/06/2018      | MW138               | 7.0-7.5         | 3.3205     | 7.50           | 3.191       | 0.130      |
| 16/06/2018      | MW138               | 9.0-9.5         | 3.3224     | 9.50           | 3.141       | 0.181      |
| 16/06/2018      | MW138               | 3.0-3.5         | 3.3074     | 3.50           | 3.17        | 0.137      |
| 16/06/2018      | MW138               | 5.0-5.5         | 3.3166     | 5.50           | 3.172       | 0.145      |
| 29/11/2019      | MW138               | 5.0-5.5         | 3.3166     | 5.50           | 3.41        | -0.093     |
| 24/06/2020      | MW138               | 3.0-3.5         | 3.3074     | 3.50           | 3.3         | 0.007      |
| 20/11/2020      | MW138               | 7.0-7.5         | 3.3205     | 7.50           | 3.38        | -0.059     |
| 24/06/2021      | MW138               | 3.0-3.5         | 3.3074     | 3.50           | 2.865       | 0.442      |
| 24/11/2021      | MW138               | 3.0-3.5         | 3.3074     | 3.50           | 3.269       | 0.038      |
| 22/06/2022      | MW138               | 3.0-3.5         | 3.3074     | 3.50           | 2.145       | 1.162      |
| 12/03/2018      | MW139               | 2.0-7.0         | 4.1386     | 7.00           | 3.885       | 0.254      |
| 16/06/2018      | MW139               | 2.0-7.0         | 4.1386     | 7.00           | 3.861       | 0.278      |
| 29/11/2019      | MW139               | 2.0-7.0         | 4.1386     | 7.00           | 3.95        | 0.189      |
| 24/06/2020      | MW139               | 2.0-7.0         | 4.1386     | 7.00           | 1.67        | 2.469      |
| 21/11/2020      | MW139               | 2.0-7.0         | 4.1386     | 7.00           | 4.03        | 0.109      |
| 24/06/2021      | MW139               | 2.0-7.0         | 4.1386     | 7.00           | 3.46        | 0.679      |
| 25/11/2021      | MW139               | 2.0-7.0         | 4.1386     | 7.00           | 3.779       | 0.360      |
| 22/06/2022      | MW139               | 2.0-7.0         | 4.1386     | 7.00           | 3.00        | 1.139      |
| 16/06/2018      | MW140               | 3.5-4.0         | 2.5035     | 4.00           | 1.835       | 0.669      |
| 16/06/2018      | MW140               | 6.0-6.5         | 2.5081     | 6.50           | 1.745       | 0.763      |
| 16/06/2018      | MW140               | 8.5-9.0         | 2.5345     | 9.00           | 1.75        | 0.785      |
| 16/06/2018      | MW140               | 1.5-2.0         | 2.4916     | 2.00           | 1.946       | 0.546      |
| 29/11/2019      | MW140               | 3.5-4.0         | 2.5035     | 4.00           | 2.00        | 0.504      |
| 24/06/2020      | MW140               | 3.5-4.0         | 2.5035     | 4.00           | 1.82        | 0.684      |
| 20/11/2020      | MW140               | 3.5-4.0         | 2.5035     | 4.00           | 1.798       | 0.706      |
| 24/06/2021      | MW140               | 6.0-6.5         | 2.5081     | 6.50           | 1.70        | 0.808      |
| 25/11/2021      | MW140               | 3.5-4.0         | 2.5035     | 4.00           | 1.85        | 0.654      |
| 23/06/2022      | MW140               | 1.5-2.0         | 2.4916     | 2.00           | 1.355       | 1.137      |
| 8/03/2018       | MW141               | 5.0-5.5         | 2.8141     | 5.50           | 2.152       | 0.662      |
| 8/03/2018       | MW141               | 7.0-7.5         | 2.8224     | 7.50           | 2.199       | 0.623      |
| 8/03/2018       | MW141               | 1.5-2.0         | 2.7999     | 2.00           | 2.1         | 0.700      |
| 8/03/2018       | MW141               | 3.0-3.5         | 2.8073     | 3.50           | 2.105       | 0.702      |
| 16/06/2018      | MW141               | 3.0-3.5         | 2.8073     | 3.50           | 2.128       | 0.679      |
| 16/06/2018      | MW141               | 5.0-5.5         | 2.8141     | 5.50           | 2.128       | 0.686      |
| 16/06/2018      | MW141               | 7.0-7.5         | 2.8224     | 7.50           | 2.127       | 0.695      |
| 16/06/2018      | MW141               | 1.5-2.0         | 2.7999     | 2.00           | 2.141       | 0.659      |
| 29/11/2019      | MW141               | 3.0-3.5         | 2.8073     | 3.50           | 2.3         | 0.507      |
| 24/06/2020      | MW141               | 3.0-3.5         | 2.8073     | 3.50           | 2.25        | 0.557      |
| 20/11/2020      | MW141               | 3.0-3.5         | 2.8073     | 3.50           | 1.64        | 1.167      |
| 24/06/2021      | MW141               | 7.0-7.5         | 2.8224     | 7.50           | 2.05        | 0.772      |
| 25/11/2021      | MW141               | 5.0-5.5         | 2.8141     | 5.50           | 2.17        | 0.644      |
| 23/06/2022      | MW141               | 1.5-2.0         | 2.7999     | 2.00           | 1.745       | 1.055      |

| Monitoring Date | Monitoring Location | Screen Interval | TOC (mAHD) | Well Depth (m) | SWL (mbTOC) | RWL (mAHD) |
|-----------------|---------------------|-----------------|------------|----------------|-------------|------------|
| 10/03/2018      | MW143               | 5.0-5.5         | 2.8204     | 5.50           | 2.71        | 0.110      |
| 10/03/2018      | MW143               | 7.0-7.5         | 2.8221     | 7.50           | 2.725       | 0.097      |
| 10/03/2018      | MW143               | 9.0-9.5         | 2.8273     | 9.50           | 2.79        | 0.037      |
| 10/03/2018      | MW143               | 3.0-3.5         | 2.8174     | 3.50           | 2.715       | 0.102      |
| 16/06/2018      | MW143               | 9.0-9.5         | 2.8273     | 9.50           | 2.69        | 0.137      |
| 16/06/2018      | MW143               | 3.0-3.5         | 2.8174     | 3.50           | 2.691       | 0.126      |
| 16/06/2018      | MW143               | 5.0-5.5         | 2.8204     | 5.50           | 2.691       | 0.129      |
| 16/06/2018      | MW143               | 7.0-7.5         | 2.8221     | 7.50           | 2.689       | 0.133      |
| 29/11/2019      | MW143               | 3.0-3.5         | 2.8174     | 3.50           | 2.93        | -0.113     |
| 25/06/2020      | MW143               | 3.0-3.5         | 2.8174     | 3.50           | 2.82        | -0.003     |
| 20/11/2020      | MW143               | 3.0-3.5         | 2.8174     | 3.50           | 2.86        | -0.043     |
| 24/06/2021      | MW143               | 3.0-3.5         | 2.8174     | 3.50           | 1.11        | 1.707      |
| 25/11/2021      | MW143               | 3.0-3.5         | 2.8174     | 3.50           | 2.69        | 0.127      |
| 22/06/2022      | MW143               | 3.0-3.5         | 2.8174     | 3.50           | 1.975       | 0.842      |
| 8/03/2018       | MW144               | 9.0-9.5         | 3.0573     | 9.50           | 2.842       | 0.215      |
| 8/03/2018       | MW144               | 3.0-3.5         | 3.0481     | 3.50           | 2.778       | 0.270      |
| 8/03/2018       | MW144               | 5.0-5.5         | 3.0520     | 5.50           | 2.787       | 0.265      |
| 8/03/2018       | MW144               | 7.0-7.5         | 3.0545     | 7.50           | 2.827       | 0.228      |
| 16/06/2018      | MW144               | 7.0-7.5         | 3.0545     | 7.50           | 2.758       | 0.297      |
| 16/06/2018      | MW144               | 9.0-9.5         | 3.0573     | 9.50           | 2.751       | 0.306      |
| 16/06/2018      | MW144               | 3.0-3.5         | 3.0481     | 3.50           | 2.79        | 0.258      |
| 16/06/2018      | MW144               | 5.0-5.5         | 3.0520     | 5.50           | 2.771       | 0.281      |
| 29/11/2019      | MW144               | 3.0-3.5         | 3.0481     | 3.50           | 2.5         | 0.548      |
| 25/06/2020      | MW144               | 3.0-3.5         | 3.0481     | 3.50           | 2.83        | 0.218      |
| 20/11/2020      | MW144               | 3.0-3.5         | 3.0481     | 3.50           | 3.01        | 0.038      |
| 24/06/2021      | MW144               | 3.0-3.5         | 3.0481     | 3.50           | 2.44        | 0.608      |
| 24/11/2021      | MW144               | 3.0-3.5         | 3.0481     | 3.50           | 2.8         | 0.248      |
| 22/06/2022      | MW144               | 3.0-3.5         | 3.0481     | 3.50           | 1.97        | 1.078      |
| 12/03/2018      | MW145               | 7.0-7.5         | 3.1506     | 7.5            | 3.033       | 0.118      |
| 12/03/2018      | MW145               | 9.0-9.5         | 3.1519     | 9.50           | 3.037       | 0.115      |
| 12/03/2018      | MW145               | 3.0-3.5         | 3.1416     | 3.50           | 3.015       | 0.127      |
| 12/03/2018      | MW145               | 5.0-5.5         | 3.1481     | 5.50           | 3.025       | 0.123      |
| 16/06/2018      | MW145               | 5.0-5.5         | 3.1481     | 5.50           | 2.943       | 0.205      |
| 16/06/2018      | MW145               | 7.0-7.5         | 3.1506     | 7.50           | 2.94        | 0.211      |
| 16/06/2018      | MW145               | 9.0-9.5         | 3.1519     | 9.50           | 2.931       | 0.221      |
| 16/06/2018      | MW145               | 3.0-3.5         | 3.1416     | 3.50           | 2.945       | 0.197      |
| 29/11/2019      | MW145               | 5.0-5.5         | 3.1481     | 5.50           | 3.25        | -0.102     |
| 24/06/2020      | MW145               | 3.0-3.5         | 3.1416     | 3.50           | 2.8         | 0.342      |
| 20/11/2020      | MW145               | 5.0-5.5         | 3.1481     | 5.50           | 3.18        | -0.032     |
| 24/06/2021      | MW145               | 5.0-5.5         | 3.1481     | 5.50           | 2.53        | 0.618      |
| 24/11/2021      | MW145               | 3.0-3.5         | 3.1416     | 3.50           | 3.001       | 0.141      |
| 22/06/2022      | MW145               | 3.0-3.5         | 3.1416     | 3.50           | 2.045       | 1.097      |
| 8/03/2018       | MW146               | 4.5-5.0         | 2.8009     | 5.00           | 2.635       | 0.166      |
| 8/03/2018       | MW146               | 7.0-7.5         | 2.8020     | 7.50           | 2.649       | 0.153      |
| 8/03/2018       | MW146               | 9.0-9.5         | 2.8184     | 9.50           | 2.645       | 0.173      |
| 8/03/2018       | MW146               | 3.0-3.5         | 2.7937     | 3.50           | 2.615       | 0.179      |
| 16/06/2018      | MW146               | 9.0-9.5         | 2.8184     | 9.50           | 2.555       | 0.263      |
| 16/06/2018      | MW146               | 3.0-3.5         | 2.7937     | 3.50           | 2.535       | 0.259      |
| 16/06/2018      | MW146               | 4.5-5.0         | 2.8009     | 5.00           | 2.513       | 0.288      |
| 16/06/2018      | MW146               | 7.0-7.5         | 2.8020     | 7.50           | 2.545       | 0.257      |
| 29/11/2019      | MW146               | 4.5-5.0         | 2.8009     | 5.00           | 2.76        | 0.041      |
| 24/06/2020      | MW146               | 4.5-5.0         | 2.8009     | 5.00           | 2.57        | 0.231      |
| 21/11/2020      | MW146               | 4.5-5.0         | 2.8009     | 5.00           | 2.84        | -0.039     |
| 24/06/2021      | MW146               | 4.5-5.0         | 2.8009     | 5.00           | 2.2         | 0.601      |
| 24/11/2021      | MW146               | 3.0-3.5         | 2.7937     | 3.50           | 2.561       | 0.233      |
| 22/06/2022      | MW146               | 3.0-3.5         | 2.7937     | 3.50           | 1.77        | 1.024      |
| 8/03/2018       | MW147               | 9.0-9.5         | 2.9209     | 9.50           | 2.808       | 0.113      |
| 8/03/2018       | MW147               | 3.0-3.5         | 2.9123     | 3.50           | 2.685       | 0.227      |
| 8/03/2018       | MW147               | 5.0-5.5         | 2.9152     | 5.50           | 2.681       | 0.234      |
| 8/03/2018       | MW147               | 7.0-7.5         | 2.9183     | 7.50           | 2.682       | 0.236      |
| 16/06/2018      | MW147               | 7.0-7.5         | 2.9183     | 7.50           | 2.598       | 0.320      |
| 16/06/2018      | MW147               | 9.0-9.5         | 2.9209     | 9.50           | 2.595       | 0.326      |
| 16/06/2018      | MW147               | 3.0-3.5         | 2.9123     | 3.50           | 2.622       | 0.290      |
| 16/06/2018      | MW147               | 5.0-5.5         | 2.9152     | 5.50           | 2.597       | 0.318      |
| 29/11/2019      | MW147               | 3.0-3.5         | 2.9123     | 3.50           | 2.8         | 0.112      |
| 24/06/2020      | MW147               | 3.0-3.5         | 2.9123     | 3.50           | 2.6         | 0.312      |
| 20/11/2020      | MW147               | 5.0-5.5         | 2.9152     | 5.50           | 2.87        | 0.045      |
| 24/06/2021      | MW147               | 5.0-5.5         | 2.9152     | 5.50           | 2.33        | 0.585      |
| 25/11/2021      | MW147               | 3.0-3.5         | 2.9123     | 3.50           | 2.817       | 0.095      |
| 23/06/2022      | MW147               | 3.0-3.5         | 2.9123     | 3.50           | 1.89        | 1.022      |



| Monitoring Date | Monitoring Location | Screen Interval | TOC (mAHD) | Well Depth (m) | SWL (mbTOC) | RWL (mAHD) |
|-----------------|---------------------|-----------------|------------|----------------|-------------|------------|
| 15/06/2018      | MW148D              | 14.0-20.0       | 3.5778     | 20.00          | 3.382       | 0.196      |
| 2/12/2019       | MW148D              | 14.0-20.0       | 3.5778     | 20.00          | 3.57        | 0.008      |
| 18/03/2020      | MW148D              | 14.0-20.0       | 3.5778     | 20.00          | 3.64        | -0.062     |
| 24/06/2020      | MW148D              | 14.0-20.0       | 3.5778     | 20.00          | 3.361       | 0.217      |
| 19/11/2020      | MW148D              | 14.0-20.0       | 3.5778     | 20.00          | 3.59        | -0.012     |
| 23/06/2021      | MW148D              | 14.0-20.0       | 3.5778     | 20.00          | 2.899       | 0.679      |
| 24/11/2021      | MW148D              | 14.0-20.0       | 3.5778     | 20.00          | 3.41        | 0.168      |
| 22/06/2022      | MW148D              | 14.0-20.0       | 3.5778     | 20.00          | 2.695       | 0.883      |
| 15/06/2018      | MW148S              | 2.0-8.0         | 3.6851     | 8.00           | 3.375       | 0.310      |
| 2/12/2019       | MW148S              | 2.0-8.0         | 3.6851     | 8.00           | 3.57        | 0.115      |
| 18/03/2020      | MW148S              | 2.0-8.0         | 3.6851     | 8.00           | 3.65        | 0.035      |
| 24/06/2020      | MW148S              | 2.0-8.0         | 3.6851     | 8.00           | 3.345       | 0.340      |
| 19/11/2020      | MW148S              | 2.0-8.0         | 3.6851     | 8.00           | 3.504       | 0.181      |
| 23/06/2021      | MW148S              | 2.0-8.0         | 3.6851     | 8.00           | 2.899       | 0.786      |
| 24/11/2021      | MW148S              | 2.0-8.0         | 3.6851     | 8.00           | 3.36        | 0.325      |
| 22/06/2022      | MW148S              | 2.0-8.0         | 3.6851     | 8.00           | 2.595       | 1.090      |
| 18/06/2018      | MW151               | 2.0-8.0         | 4.0631     | 8.00           | 3.673       | 0.390      |
| 18/03/2020      | MW151               | 2.0-8.0         | 4.0631     | 8.00           | 3.93        | 0.133      |
| 24/06/2020      | MW151               | 2.0-8.0         | 4.0631     | 8.00           | 3.661       | 0.402      |
| 19/11/2020      | MW151               | 2.0-8.0         | 4.0631     | 8.00           | 3.849       | 0.214      |
| 23/06/2021      | MW151               | 2.0-8.0         | 4.0631     | 8.00           | 3.307       | 0.756      |
| 24/11/2021      | MW151               | 2.0-8.0         | 4.0631     | 8.00           | 3.68        | 0.383      |
| 22/06/2022      | MW151               | 2.0-8.0         | 4.0631     | 8.00           | 3.02        | 1.043      |
| 15/06/2018      | MW159               | 3.0-9.0         | 4.1895     | 9.00           | 3.707       | 0.483      |
| 29/11/2019      | MW159               | 3.0-9.0         | 4.1895     | 9.00           | 4.1         | 0.090      |
| 18/03/2020      | MW159               | 3.0-9.0         | 4.1895     | 9.00           | 3.98        | 0.210      |
| 24/06/2020      | MW159               | 3.0-9.0         | 4.1895     | 9.00           | 3.706       | 0.484      |
| 20/11/2020      | MW159               | 3.0-9.0         | 4.1895     | 9.00           | 3.92        | 0.270      |
| 23/06/2021      | MW159               | 3.0-9.0         | 4.1895     | 9.00           | 3.365       | 0.825      |
| 23/11/2021      | MW159               | 3.0-9.0         | 4.1895     | 9.00           | 3.765       | 0.425      |
| 25/11/2021      | MW159               | 3.0-9.0         | 4.1895     | 9.00           | 3.744       | 0.446      |
| 22/06/2022      | MW159               | 3.0-9.0         | 4.1895     | 9.00           | 3.1         | 1.089      |
| 15/06/2018      | MW162               | 17.0-20.0       | 6.856      | 20.00          | 5.652       | 1.204      |
| 26/11/2019      | MW162               | 17.0-20.0       | 6.856      | 20.00          | 6.1         | 0.756      |
| 24/06/2020      | MW162               | 17.0-20.0       | 6.856      | 20.00          | 6.01        | 0.846      |
| 15/10/2020      | MW162               | 17.0-20.0       | 6.856      | 20.00          | 6.129       | 0.727      |
| 19/11/2020      | MW162               | 17.0-20.0       | 6.856      | 20.00          | 6.16        | 0.696      |
| 23/02/2021      | MW162               | 17.0-20.0       | 6.856      | 20.00          | 6.167       | 0.689      |
| 23/06/2021      | MW162               | 17.0-20.0       | 6.856      | 20.00          | 5.64        | 1.216      |
| 23/11/2021      | MW162               | 17.0-20.0       | 6.856      | 20.00          | 5.938       | 0.918      |
| 24/11/2021      | MW162               | 17.0-20.0       | 6.856      | 20.00          | 5.876       | 0.980      |
| 22/06/2022      | MW162               | 17.0-20.0       | 6.856      | 20.00          | 5.45        | 1.406      |
| 15/06/2018      | MW163               | 17.0-20.0       | 6.7808     | 20.00          | 5.874       | 0.907      |
| 26/11/2019      | MW163               | 17.0-20.0       | 6.7808     | 20.00          | 6.05        | 0.731      |
| 24/06/2020      | MW163               | 17.0-20.0       | 6.7808     | 20.00          | 5.955       | 0.826      |
| 19/11/2020      | MW163               | 17.0-20.0       | 6.7808     | 20.00          | 6.09        | 0.691      |
| 23/06/2021      | MW163               | 17.0-20.0       | 6.7808     | 20.00          | 5.55        | 1.231      |
| 24/11/2021      | MW163               | 17.0-20.0       | 6.7808     | 20.00          | 6.403       | 0.378      |
| 22/06/2022      | MW163               | 17.0-20.0       | 6.7808     | 20.00          | 5.36        | 1.421      |
| 15/06/2018      | MW164               | 17.0-20.0       | 6.7893     | 20.00          | 5.91        | 0.879      |
| 26/11/2019      | MW164               | 17.0-20.0       | 6.7893     | 20.00          | 6.07        | 0.719      |
| 24/06/2020      | MW164               | 17.0-20.0       | 6.7893     | 20.00          | 5.95        | 0.839      |
| 19/11/2020      | MW164               | 17.0-20.0       | 6.7893     | 20.00          | 6.11        | 0.679      |
| 23/06/2021      | MW164               | 17.0-20.0       | 6.7893     | 20.00          | 5.55        | 1.239      |
| 25/11/2021      | MW164               | 17.0-20.0       | 6.7893     | 20.00          | 5.868       | 0.921      |
| 22/06/2022      | MW164               | 17.0-20.0       | 6.7893     | 20.00          | 5.35        | 1.439      |
| 10/06/2018      | MW165               | 3.0-9.0         | 6.1043     | 9.00           | 5.191       | 0.913      |
| 26/11/2019      | MW165               | 3.0-9.0         | 6.1043     | 9.00           | 5.34        | 0.764      |
| 24/06/2020      | MW165               | 3.0-9.0         | 6.1043     | 9.00           | 5.26        | 0.844      |
| 19/11/2020      | MW165               | 3.0-9.0         | 6.1043     | 9.00           | 5.36        | 0.744      |
| 23/06/2021      | MW165               | 3.0-9.0         | 6.1043     | 9.00           | 4.85        | 1.254      |
| 24/11/2021      | MW165               | 3.0-9.0         | 6.1043     | 9.00           | 5.148       | 0.956      |
| 22/06/2022      | MW165               | 3.0-9.0         | 6.1043     | 9.00           | 4.63        | 1.474      |
| 10/06/2018      | MW166               | 2.5-8.5         | 5.7441     | 8.50           | 4.875       | 0.869      |
| 26/11/2019      | MW166               | 2.5-8.5         | 5.7441     | 8.50           | 5.015       | 0.729      |
| 24/06/2020      | MW166               | 2.5-8.5         | 5.7441     | 8.50           | 4.92        | 0.824      |
| 19/11/2020      | MW166               | 2.5-8.5         | 5.7441     | 8.50           | 5.05        | 0.694      |
| 23/06/2021      | MW166               | 2.5-8.5         | 5.7441     | 8.50           | 4.55        | 1.194      |
| 24/11/2021      | MW166               | 2.5-8.5         | 5.7441     | 8.50           | 4.812       | 0.932      |
| 22/06/2022      | MW166               | 2.5-8.5         | 5.7441     | 8.50           | 4.3         | 1.444      |

| Monitoring Date | Monitoring Location | Screen Interval | TOC (mAHD) | Well Depth (m) | SWL (mbTOC) | RWL (mAHD) |
|-----------------|---------------------|-----------------|------------|----------------|-------------|------------|
| 10/06/2018      | MW167               | 2.5-8.5         | 6.2094     | 8.50           | 5.379       | 0.830      |
| 26/11/2019      | MW167               | 2.5-8.5         | 6.2094     | 8.50           | 5.525       | 0.684      |
| 25/06/2020      | MW167               | 2.5-8.5         | 6.2094     | 8.50           | 5.39        | 0.819      |
| 19/11/2020      | MW167               | 2.5-8.5         | 6.2094     | 8.50           | 5.56        | 0.649      |
| 23/06/2021      | MW167               | 2.5-8.5         | 6.2094     | 8.50           | 5.06        | 1.149      |
| 24/11/2021      | MW167               | 2.5-8.5         | 6.2094     | 8.50           | 5.304       | 0.905      |
| 22/06/2022      | MW167               | 2.5-8.5         | 6.2094     | 8.50           | 4.86        | 1.349      |
| 10/06/2018      | MW168               | 2.5-8.5         | 6.1713     | 8.50           | 5.4         | 0.771      |
| 26/11/2019      | MW168               | 2.5-8.5         | 6.1713     | 8.50           | 5.55        | 0.621      |
| 25/06/2020      | MW168               | 2.5-8.5         | 6.1713     | 8.50           | 5.408       | 0.763      |
| 19/11/2020      | MW168               | 2.5-8.5         | 6.1713     | 8.50           | 5.57        | 0.601      |
| 23/06/2021      | MW168               | 2.5-8.5         | 6.1713     | 8.50           | 5.08        | 1.091      |
| 24/11/2021      | MW168               | 2.5-8.5         | 6.1713     | 8.50           | 5.335       | 0.836      |
| 22/06/2022      | MW168               | 2.5-8.5         | 6.1713     | 8.50           | 4.89        | 1.281      |
| 18/06/2018      | MW170               | 2.5-8.5         | 5.639      | 8.50           | 5.161       | 0.478      |
| 29/11/2019      | MW170               | 2.5-8.5         | 5.639      | 8.50           | 5.27        | 0.369      |
| 24/06/2020      | MW170               | 2.5-8.5         | 5.639      | 8.50           | 4.398       | 1.241      |
| 16/10/2020      | MW170               | 2.5-8.5         | 5.639      | 8.50           | 5.298       | 0.341      |
| 19/11/2020      | MW170               | 2.5-8.5         | 5.639      | 8.50           | 5.299       | 0.340      |
| 24/02/2021      | MW170               | 2.5-8.5         | 5.639      | 8.50           | 5.376       | 0.263      |
| 23/06/2021      | MW170               | 2.5-8.5         | 5.639      | 8.50           | 4.764       | 0.875      |
| 23/11/2021      | MW170               | 2.5-8.5         | 5.639      | 8.50           | 5.023       | 0.616      |
| 25/11/2021      | MW170               | 2.5-8.5         | 5.639      | 8.50           | 4.994       | 0.645      |
| 22/06/2022      | MW170               | 2.5-8.5         | 5.639      | 8.50           | 4.56        | 1.079      |
| 18/06/2018      | MW172               | 2.5-8.5         | 5.6193     | 8.50           | 5.061       | 0.558      |
| 29/11/2019      | MW172               | 2.5-8.5         | 5.6193     | 8.50           | 5.19        | 0.429      |
| 24/06/2020      | MW172               | 2.5-8.5         | 5.6193     | 8.50           | 5.051       | 0.568      |
| 19/11/2020      | MW172               | 2.5-8.5         | 5.6193     | 8.50           | 5.198       | 0.421      |
| 23/06/2021      | MW172               | 2.5-8.5         | 5.6193     | 8.50           | 4.714       | 0.905      |
| 25/11/2021      | MW172               | 2.5-8.5         | 5.6193     | 8.50           | 4.933       | 0.686      |
| 22/06/2022      | MW172               | 2.5-8.5         | 5.6193     | 8.50           | 4.533       | 1.086      |
| 17/06/2018      | MW175               | 7.0-7.5         | 4.7995     | 7.50           | 4.242       | 0.558      |
| 17/06/2018      | MW175               | 9.0-9.5         | 4.8316     | 9.50           | 4.236       | 0.596      |
| 17/06/2018      | MW175               | 4.0-4.5         | 4.7916     | 4.50           | 4.391       | 0.401      |
| 17/06/2018      | MW175               | 5.5-6.0         | 4.7982     | 6.00           | 4.29        | 0.508      |
| 29/11/2019      | MW175               | 5.5-6.0         | 4.7982     | 6.00           | 4.52        | 0.278      |
| 25/06/2020      | MW175               | 5.5-6.0         | 4.7982     | 6.00           | 4.82        | -0.022     |
| 20/11/2020      | MW175               | 5.5-6.0         | 4.7982     | 6.00           | 5           | -0.202     |
| 23/06/2021      | MW175               | 7.0-7.5         | 4.7995     | 7.50           | 4.13        | 0.670      |
| 24/11/2021      | MW175               | 5.5-6.0         | 4.7982     | 6.00           | 4.3         | 0.498      |
| 23/06/2022      | MW175               | 4.0-4.5         | 4.7916     | 4.50           | 3.84        | 0.952      |
| 17/06/2018      | MW176               | 1.5-2.0         | 2.1274     | 2.00           | 1.835       | 0.292      |
| 17/06/2018      | MW176               | 3.5-4.0         | 2.1279     | 4.00           | 1.7         | 0.428      |
| 17/06/2018      | MW176               | 6.0-6.5         | 2.1294     | 6.50           | 1.72        | 0.409      |
| 17/06/2018      | MW176               | 8.5-9.0         | 2.1712     | 9.00           | 1.631       | 0.540      |
| 29/11/2019      | MW176               | 3.5-4.0         | 2.1279     | 4.00           | 1.97        | 0.158      |
| 24/06/2020      | MW176               | 1.5-2.0         | 2.1274     | 2.00           | 1.88        | 0.247      |
| 20/11/2020      | MW176               | 1.5-2.0         | 2.1274     | 2.00           | 1.835       | 0.292      |
| 23/06/2021      | MW176               | 3.5-4.0         | 2.1279     | 4.00           | 1.24        | 0.888      |
| 24/11/2021      | MW176               | 6.0-6.5         | 2.1594     | 6.50           | 1.78        | 0.379      |
| 23/06/2022      | MW176               | 1.5-2.0         | 2.1274     | 2.00           | 1.315       | 0.812      |
| 17/06/2018      | MW177               | 1.5-2.0         | 2.2299     | 2.00           | 1.739       | 0.491      |
| 17/06/2018      | MW177               | 3.5-4.0         | 2.2517     | 4.00           | 1.553       | 0.699      |
| 17/06/2018      | MW177               | 6.0-6.5         | 2.2531     | 6.50           | 1.415       | 0.838      |
| 17/06/2018      | MW177               | 8.5-9.0         | 2.2718     | 9.00           | 1.371       | 0.901      |
| 29/11/2019      | MW177               | 1.5-2.0         | 2.2299     | 2.00           | 2.01        | 0.220      |
| 24/06/2020      | MW177               | 1.5-2.0         | 2.2299     | 2.00           | 1.7         | 0.530      |
| 20/11/2020      | MW177               | 1.5-2.0         | 2.2299     | 2.00           | 1.535       | 0.695      |
| 23/06/2021      | MW177               | 3.5-4.0         | 2.2517     | 4.00           | 0.9         | 1.352      |
| 24/11/2021      | MW177               | 3.5-4.0         | 2.2517     | 4.00           | 1.63        | 0.622      |
| 23/06/2022      | MW177               | 1.5-2.0         | 2.2299     | 2.00           | 1.205       | 1.025      |
| 17/06/2018      | MW178               | 7.0-7.5         | 2.1726     | 7.50           | 1.887       | 0.286      |
| 17/06/2018      | MW178               | 9.0-9.5         | 2.1762     | 9.50           | 1.86        | 0.316      |
| 17/06/2018      | MW178               | 2.0-2.5         | 2.1612     | 2.50           | 2.068       | 0.093      |
| 17/06/2018      | MW178               | 4.0-4.5         | 2.1614     | 4.50           | 1.995       | 0.166      |
| 29/11/2019      | MW178               | 4.0-4.5         | 2.1614     | 4.50           | 2.3         | -0.139     |
| 24/06/2020      | MW178               | 2.0-2.5         | 2.1612     | 2.50           | 1.95        | 0.211      |
| 20/11/2020      | MW178               | 4.0-4.5         | 2.1614     | 4.50           | 2.06        | 0.101      |
| 24/06/2021      | MW178               | 4.0-4.5         | 2.1614     | 4.50           | 1.75        | 0.411      |
| 24/11/2021      | MW178               | 9.0-9.5         | 2.1762     | 9.50           | 1.86        | 0.316      |
| 23/06/2022      | MW178               | 2.0-2.5         | 2.1612     | 2.50           | 1.35        | 0.811      |

| Monitoring Date | Monitoring Location | Screen Interval | TOC (mAHD) | Well Depth (m) | SWL (mbTOC) | RWL (mAHD) |
|-----------------|---------------------|-----------------|------------|----------------|-------------|------------|
| 16/06/2018      | MW179               | 1.0-1.5         | 2.2220     | 1.50           | 1.392       | 0.830      |
| 16/06/2018      | MW179               | 3.2-3.7         | 2.2371     | 3.70           | 1.465       | 0.772      |
| 16/06/2018      | MW179               | 5.9-6.4         | 2.2653     | 6.40           | 1.375       | 0.890      |
| 16/06/2018      | MW179               | 8.5-9.0         | 2.2689     | 9.00           | 1.211       | 1.058      |
| 29/11/2019      | MW179               | 3.2-3.7         | 2.2371     | 3.70           | 1.71        | 0.527      |
| 24/06/2020      | MW179               | 1.0-1.5         | 2.2220     | 1.50           | 1.43        | 0.792      |
| 20/11/2020      | MW179               | 3.2-3.7         | 2.2371     | 3.70           | 2.1         | 0.137      |
| 24/06/2021      | MW179               | 3.2-3.7         | 2.2371     | 3.70           | 2.46        | -0.223     |
| 24/11/2021      | MW179               | 3.2-3.7         | 2.2371     | 3.70           | 1.535       | 0.702      |
| 22/06/2022      | MW179               | 1.0-1.5         | 2.2220     | 1.50           | 0.9         | 1.322      |
| 17/06/2018      | MW180               | 1.0-1.5         | 1.9179     | 1.50           | 1.48        | 0.438      |
| 17/06/2018      | MW180               | 3.5-4.0         | 1.9226     | 4.00           | 1.177       | 0.746      |
| 17/06/2018      | MW180               | 6.0-6.5         | 1.9368     | 6.50           | 1.06        | 0.877      |
| 17/06/2018      | MW180               | 8.5-9.0         | 1.9458     | 9.00           | 1.028       | 0.918      |
| 29/11/2019      | MW180               | 6.0-6.5         | 1.9368     | 6.50           | 1.75        | 0.187      |
| 24/06/2020      | MW180               | 3.5-4.0         | 1.9226     | 4.00           | 1.47        | 0.453      |
| 21/11/2020      | MW180               | 3.5-4.0         | 1.9226     | 4.00           | 1.521       | 0.402      |
| 24/06/2021      | MW180               | 1.0-1.5         | 1.9179     | 1.50           | 1.16        | 0.758      |
| 24/11/2021      | MW180               | 3.5-4.0         | 1.9226     | 4.00           | 1.64        | 0.283      |
| 23/06/2022      | MW180               | 1.0-1.5         | 1.9179     | 1.50           | 0.85        | 1.068      |
| 16/06/2018      | MW181               | 5.5-6.0         | 2.2789     | 6.00           | 1.81        | 0.469      |
| 16/06/2018      | MW181               | 7.0-7.5         | 2.3122     | 7.50           | 1.74        | 0.572      |
| 16/06/2018      | MW181               | 1.5-2.0         | 2.2333     | 2.00           | 1.855       | 0.378      |
| 16/06/2018      | MW181               | 3.5-4.0         | 2.2773     | 4.00           | 1.701       | 0.576      |
| 29/11/2019      | MW181               | 3.5-4.0         | 2.2773     | 4.00           | 2.05        | 0.227      |
| 24/06/2020      | MW181               | 3.5-4.0         | 2.2773     | 4.00           | 1.9         | 0.377      |
| 20/11/2020      | MW181               | 1.5-2.0         | 2.2333     | 2.00           | 1.904       | 0.329      |
| 24/06/2021      | MW181               | 5.5-6.0         | 2.2789     | 6.00           | 1.52        | 0.759      |
| 25/11/2021      | MW181               | 3.5-4.0         | 2.2773     | 4.00           | 1.81        | 0.467      |
| 23/06/2022      | MW181               | 3.5-4.0         | 2.2773     | 4.00           | 1.3         | 0.977      |
| 9/03/2018       | MW211               | unknown         | 6.3409     | unknown        | 5.445       | 0.896      |
| 9/06/2018       | MW211               | unknown         | 6.3409     | unknown        | 5.39        | 0.951      |
| 26/11/2019      | MW211               | unknown         | 6.3409     | unknown        | 5.57        | 0.771      |
| 24/06/2020      | MW211               | unknown         | 6.3409     | unknown        | 5.455       | 0.886      |
| 14/10/2020      | MW211               | unknown         | 6.3409     | unknown        | 5.591       | 0.750      |
| 19/11/2020      | MW211               | unknown         | 6.3409     | unknown        | 5.64        | 0.701      |
| 23/02/2021      | MW211               | unknown         | 6.3409     | unknown        | 5.595       | 0.746      |
| 23/06/2021      | MW211               | unknown         | 6.3409     | unknown        | 5.08        | 1.261      |
| 23/11/2021      | MW211               | unknown         | 6.3409     | unknown        | 5.359       | 0.982      |
| 25/11/2021      | MW211               | unknown         | 6.3409     | unknown        | 5.408       | 0.933      |
| 22/06/2022      | MW211               | unknown         | 6.3409     | unknown        | 4.87        | 1.471      |
| 31/10/2022      | MW211               | unknown         | 6.3409     | unknown        | 3.622       | 2.719      |
| 6/03/2018       | MW233               | 4.0-7.0         | 6.2620     | 7.00           | 5.34        | 0.922      |
| 10/06/2018      | MW233               | 4.0-7.0         | 6.2620     | 7.00           | 5.32        | 0.942      |
| 15/10/2020      | MW233               | 4.0-7.0         | 6.2620     | 7.00           | 5.502       | 0.760      |
| 23/02/2021      | MW233               | 4.0-7.0         | 6.2620     | 7.00           | 5.538       | 0.724      |
| 23/06/2021      | MW233               | 4.0-7.0         | 6.2620     | 7.00           | 5           | 1.262      |
| 23/11/2021      | MW233               | 4.0-7.0         | 6.2620     | 7.00           | 5.286       | 0.976      |
| 24/11/2021      | MW233               | 4.0-7.0         | 6.2620     | 7.00           | 5.247       | 1.015      |
| 22/06/2022      | MW233               | 4.0-7.0         | 6.2620     | 7.00           | 4.8         | 1.462      |
| 24/11/2021      | MW238               | 3.0-6.0         | 3.980      | 6.00           | 3.16        | 0.820      |
| 22/06/2022      | MW238               | 3.0-6.0         | 3.980      | 6.00           | 2.92        | 1.060      |



|          |      |                   | DO (Field) | Temperature (Field) | Redox Potential (Field) | Electrical Conductivity (field) | pH (Field) |
|----------|------|-------------------|------------|---------------------|-------------------------|---------------------------------|------------|
| Location | Well | Sampled Date/Time | mg/L       | °C                  | mV                      | µS/cm                           | pH Units   |
| MW016    | -    | 21/02/2018        | 2.09       | 28.6                | -11.1                   | 8778                            | 7.45       |
| MW016    | -    | 14/06/2018        | 0.96       | 30.5                | 75.2                    | 13129                           | 7.2        |
| MW016    | -    | 2/12/2019         | 5.92       | 30.7                | 5.2                     | 11597                           | 7.36       |
| MW016    | -    | 24/06/2020        | 1.36       | 28.2                | -22.5                   | 11585                           | 7.3        |
| MW016    | -    | 19/11/2020        | 1.78       | 29.6                | 9.3                     | 12869                           | 7.06       |
| MW016    | -    | 23/06/2021        | 1.26       | 25.1                | 4.1                     | 10117                           | 7.33       |
| MW018    | -    | 10/06/2018        | 2.13       | 30.2                | 129.4                   | 6170                            | 7.15       |
| MW018    | -    | 24/06/2020        | 2.7        | 29.5                | -52.8                   | 3462                            | 7.47       |
| MW018    | -    | 14/10/2020        | 2.85       | 30.3                | 114.8                   | 4283                            | 7.25       |
| MW018    | -    | 19/11/2020        | 2.99       | 30.8                | 20.8                    | 5026                            | 7.67       |
| MW018    | -    | 23/02/2021        | 0.93       | 32.2                | 37.5                    | 5921                            | 7.21       |
| MW018    | -    | 23/06/2021        | 3.25       | 26.5                | 136.5                   | 3065                            | 7.88       |
| MW018    | -    | 18/01/2022        | 2.42       | 30                  | -47.9                   | 3195                            | 7.9        |
| MW018    | -    | 22/06/2022        | 3.06       | 29.8                | 28.9                    | 2889                            | 7.93       |
| MW018    | -    | 31/10/2022        | 2.33       | 28.3                | 48.2                    | 2680                            | 7.87       |
| MW021    | -    | 6/03/2018         | 1.75       | 30.6                | 89.9                    | 11568                           | 6.94       |
| MW021    | -    | 10/06/2018        | 3.12       | 30                  | 139.8                   | 10640                           | 6.88       |
| MW021    | -    | 26/11/2019        |            | 30.4                | 131                     | 4210                            | 7.66       |
| MW021    | -    | 24/06/2020        | 2.28       | 25.8                | -73                     | 5275                            | 7.19       |
| MW021    | -    | 23/02/2021        | 2.26       | 31.7                | 119.3                   | 7204                            | 5.79       |
| MW021    | -    | 23/06/2021        | 2.5        | 23.1                | 190.1                   | 6746                            | 7.32       |
| MW021    | -    | 23/11/2021        | 2.18       | 28.8                | 94.5                    | 6821                            | 7.37       |
| MW021    | -    | 18/01/2022        | 3.2        | 31.5                | 104                     | 3887                            | 8.01       |
| MW021    | -    | 22/06/2022        | 2.48       | 27.9                | 25.6                    | 4173                            | 7.92       |
| MW021    | -    | 31/10/2022        | 3.59       | 25.3                | 55.6                    | 2574                            | 7.01       |
| MW102    | -    | 9/06/2018         | 0.13       | 30.1                | 97.3                    | 100165                          | 6.75       |
| MW102    | -    | 2/12/2019         | 1.61       | 29.8                | 8.5                     | 95137                           | 6.82       |
| MW102    | -    | 24/06/2020        | 3.17       | 30                  | 49.1                    | 88788                           | 7.02       |
| MW102    | -    | 19/11/2020        | 0.7        | 28.9                | 56.4                    | 98424                           | 6.8        |
| MW102    | -    | 23/06/2021        | 16.2       | 25.4                | 72.4                    | 90727                           | 6.95       |
| MW102    | -    | 18/01/2022        | 0.72       | 28.4                | 137                     | 89930                           | 7.02       |
| MW102    | -    | 22/06/2022        | 0.98       | 27.9                | 56.2                    | 88214                           | 7.06       |
| MW103    | -    | 15/06/2018        | 0.13       | 29.7                | -59.9                   | 75220                           | 6.82       |
| MW103    | -    | 30/11/2019        | 1          | 31.4                | -59.7                   | 80068                           | 6.82       |
| MW103    | -    | 24/06/2020        | 0.56       | 29.2                | -142.1                  | 76604                           | 6.85       |
| MW103    | -    | 20/11/2020        | 0.53       | 28.9                | -93.3                   | 79683                           | 6.66       |
| MW103    | -    | 23/06/2021        | 0.78       | 26                  | -76.6                   | 77824                           | 6.87       |
| MW103    | -    | 18/01/2022        | 3.42       | 29.4                | -21.8                   | 76112                           | 7.2        |
| MW104    | -    | 14/06/2018        | 0.04       | 29.8                | -83.2                   | 85415                           | 6.97       |
| MW104    | -    | 29/11/2019        | 2.76       | 28.3                | -66.2                   | 26369                           | 7.22       |
| MW104    | -    | 24/06/2020        | 0.66       | 28.4                | -164.8                  | 86955                           | 7.02       |
| MW104    | -    | 19/11/2020        | 4.22       | 29.1                | 27.2                    | 89312                           | 6.83       |
| MW104    | -    | 23/06/2021        | 2.77       | 24.1                | 105.4                   | 42018                           | 7.225      |
| MW104    | -    | 18/01/2022        | 2.18       | 29.2                | 37.3                    | 82320                           | 7.19       |
| MW104    | -    | 22/06/2022        | 0.89       | 27.7                | 37                      | 80922                           | 7.12       |
| MW105    | -    | 13/06/2018        | 0.15       | 29.9                | 108.3                   | 48895                           | 6.69       |
| MW105    | -    | 29/11/2019        | 2.38       | 30.5                | -80.3                   | 21924                           | 6.91       |
| MW105    | -    | 2/12/2019         | 2.09       | 32.9                | -160.3                  | 48900                           | 6.95       |
| MW105    | -    | 23/06/2021        | 2.31       | 22.9                | 1.5                     | 44390                           | 7          |
| MW105    | -    | 18/01/2022        | 1.11       | 27.8                | 106.3                   | 45186                           | 6.91       |
| MW105    | -    | 22/06/2022        | 0.8        | 27.5                | 33                      | 46173                           | 6.85       |
| MW112    | -    | 8/06/2018         | 1.26       | 30.4                | 93.5                    | 16229                           | 6.74       |
| MW112    | -    | 26/11/2019        | 2.86       | 30.3                | 142.8                   | 15268                           | 6.98       |
| MW112    | -    | 25/06/2020        | 1.89       | 28.7                | 61.7                    | 15350                           | 7.07       |
| MW112    | -    | 19/11/2020        | 2.39       | 29.2                | 46.6                    | 15058                           | 7.32       |
| MW112    | -    | 24/06/2021        | 3.36       | 23.6                | 50.6                    | 12943                           | 7.26       |
| MW112    | -    | 18/01/2022        | 2.85       | 29.2                | 125.9                   | 12869                           | 7.2        |
| MW112    | -    | 22/06/2022        | 0.88       | 27.7                | -183.2                  | 12559                           | 7.17       |
| MW113    | -    | 14/06/2018        | 1.55       | 29.9                | 97.1                    | 11226                           | 6.78       |
| MW113    | -    | 29/11/2019        | 4.79       | 29.3                | -37.3                   | 12161                           | 7.26       |

|          |         |                   | DO (Field) | Temperature (Field) | Redox Potential (Field) | Electrical Conductivity (field) | pH (Field) |
|----------|---------|-------------------|------------|---------------------|-------------------------|---------------------------------|------------|
| Location | Well    | Sampled Date/Time | mg/L       | °C                  | mV                      | µS/cm                           | pH Units   |
| MW113    | -       | 24/06/2020        | 2.5        | 28.9                | -51.7                   | 10297                           | 6.74       |
| MW113    | -       | 15/10/2020        | 3.55       | 30.7                | 145.8                   | 11285                           | 6.76       |
| MW113    | -       | 19/11/2020        | 4.09       | 30.3                | 84.5                    | 12515                           | 7.33       |
| MW113    | -       | 23/02/2021        | 1.32       | 33.6                | 89.3                    | 11792                           | 6.85       |
| MW113    | -       | 23/06/2021        | 2.6        | 26.2                | 125.1                   | 10527                           | 7.06       |
| MW113    | -       | 18/01/2022        | 2.55       | 30.5                | 123.8                   | 10462                           | 6.99       |
| MW113    | -       | 22/06/2022        | 2.54       | 28.8                | 42.1                    | 10518                           | 7.12       |
| MW114    | -       | 10/06/2018        | 0.78       | 26.7                | 123.4                   | 9566                            | 7.03       |
| MW114    | -       | 26/11/2019        | 5.66       | 34.4                | 131.3                   | 4991                            | 7          |
| MW114    | -       | 24/06/2020        | 1.78       | 26.3                | 10.7                    | 8455                            | 6.91       |
| MW114    | -       | 19/11/2020        | 2.89       | 27.7                | 125.3                   | 10704                           | 7.26       |
| MW114    | -       | 23/06/2021        | 2.61       | 24                  | 142.6                   | 8998                            | 7.2        |
| MW114    | -       | 18/01/2022        | 2.16       | 29.4                | 114.1                   | 8863                            | 7.19       |
| MW114    | -       | 22/06/2022        | 1.4        | 28.7                | 34.7                    | 8931                            | 7.14       |
| MW115    | -       | 8/06/2018         | 0.85       | 30.5                | 101.5                   | 42390                           | 6.56       |
| MW115    | -       | 29/11/2019        | 4.37       | 28.4                | -67.4                   | 21318                           | 7.21       |
| MW115    | -       | 25/06/2020        | 3.12       | 27.4                | 57.4                    | 38328                           | 6.87       |
| MW115    | -       | 19/11/2020        | 1.19       | 28.3                | 41.3                    | 36921                           | 7.03       |
| MW115    | -       | 24/06/2021        | 2.69       | 23.7                | 59.1                    | 35391                           | 7.09       |
| MW115    | -       | 18/01/2022        | 1.28       | 30.3                | 1114                    | 34870                           | 6.85       |
| MW115    | -       | 22/06/2022        | 0.7        | 28.6                | -208.8                  | 33667                           | 6.89       |
| MW122    | -       | 15/06/2018        | 0.65       | 29.8                | 112.2                   | 50547                           | 6.97       |
| MW122    | -       | 30/11/2019        | 1.87       | 30.3                | -398.7                  | 34606                           | 7.28       |
| MW122    | -       | 25/06/2020        | 0.92       | 27                  | 40.6                    | 33727                           | 7.37       |
| MW122    | -       | 19/11/2020        | 0.66       | 28                  | 69.9                    | 34302                           | 7.44       |
| MW122    | -       | 24/06/2021        | 0.89       | 25.1                | 55.6                    | 46016                           | 7.08       |
| MW122    | -       | 18/01/2022        | 1.25       | 28.6                | 25                      | 44823                           | 7.17       |
| MW122    | -       | 22/06/2022        | 1.11       | 28.4                | 41.3                    | 33250                           | 7.56       |
| MW124    | -       | 9/06/2018         | 0.12       | 29.5                | -115.7                  | 92877                           | 6.89       |
| MW124    | -       | 2/12/2019         | 0.84       | 29.8                | 28.3                    | 94945                           | 6.97       |
| MW124    | -       | 19/11/2020        | 1.07       | 29.1                | 75.4                    | 93370                           | 6.79       |
| MW124    | -       | 23/06/2021        | 3.51       | 24.7                | 13.4                    | 52600                           | 7.45       |
| MW124    | -       | 18/01/2022        | 1.51       | 30.1                | -32.6                   | 85714                           | 7.24       |
| MW124    | -       | 22/06/2022        | 2.47       | 26.6                | 43.4                    | 83833                           | 7.33       |
| MW126    | -       | 8/06/2018         | 0.16       | 29.3                | 96.2                    | 80311                           | 6.61       |
| MW126    | -       | 29/11/2019        | 2.18       |                     | 76.8                    | 25135                           | 7          |
| MW126    | -       | 24/06/2020        | 1.37       | 29                  | 90.2                    | 73576                           | 7.4        |
| MW126    | -       | 23/06/2021        | 2.8        | 25.8                | 103.4                   | 61001                           | 7.06       |
| MW126    | -       | 18/01/2022        | 2.04       | 29.8                | 138.1                   | 59812                           | 7.09       |
| MW126    | -       | 22/06/2022        | 0.46       | 26.4                | 56.3                    | 70710                           | 6.91       |
| MW127    | -       | 8/06/2018         | 3.41       | 29.9                | 98.5                    | 76160                           | 6.79       |
| MW127    | -       | 29/11/2019        | 2.74       | 29.1                | -71.4                   | 21454                           | 7.05       |
| MW127    | -       | 25/06/2020        | 2.34       | 29.5                | 111.8                   | 74776                           | 6.97       |
| MW127    | -       | 19/11/2020        | 1.52       | 31.4                | 106.8                   | 66878                           | 7.22       |
| MW127    | -       | 23/06/2021        | 2.2        | 25.3                | 122.7                   | 37527                           | 7.2        |
| MW127    | -       | 18/01/2022        | 1.33       | 28.4                | 125.4                   | 71601                           | 7          |
| MW127    | -       | 22/06/2022        | 1.42       | 25.5                | 81.4                    | 68237                           | 6.98       |
| MW134    | -       | 10/06/2018        | 0.08       | 29.4                | -98.6                   | 64396                           | 7.14       |
| MW134    | -       | 29/11/2019        | 0.92       | 29.2                | -88.3                   | 64577                           | 7.02       |
| MW134    | -       | 26/06/2020        | 1.65       | 26.5                | 42.5                    | 57148                           | 7.34       |
| MW134    | -       | 20/11/2020        | 0.92       | 28.7                | -81.2                   | 63692                           | 6.95       |
| MW134    | -       | 24/06/2021        | 2.97       | 22.8                | 8.1                     | 61680                           | 5.85       |
| MW134    | -       | 18/01/2022        | 1.28       | 30.3                | 81.6                    | 60099                           | 7.3        |
| MW134    | -       | 23/06/2022        | 1.01       | 24.8                | 54.5                    | 60852                           | 7.02       |
| MW135    | 2.5-3.0 | 8/03/2018         | 0.34       | 30.2                | -73.6                   | 34560                           | 7.35       |
| MW135    | 4.5-5.0 | 8/03/2018         | 0.22       | 29.6                | -137.3                  | 41522                           | 7.42       |
| MW135    | 6.5-7.0 | 8/03/2018         | 0.34       | 29.5                | -182.4                  | 45044                           | 7.45       |
| MW135    | 9.0-9.5 | 8/03/2018         | 0.2        | 29.4                | -185.6                  | 40733                           | 7.47       |
| MW135    | 2.5-3.0 | 16/06/2018        | 0.35       | 28.5                | -76.9                   | 34243                           | 7.16       |
| MW135    | 4.5-5.0 | 16/06/2018        | 0.09       | 29.1                | -98.6                   | 42655                           | 7.19       |
| MW135    | 6.5-7.0 | 16/06/2018        | 0.07       | 28.7                | -95.8                   | 47820                           | 7.19       |

|          |         |                   | DO (Field) | Temperature (Field) | Redox Potential (Field) | Electrical Conductivity (field) | pH (Field) |
|----------|---------|-------------------|------------|---------------------|-------------------------|---------------------------------|------------|
| Location | Well    | Sampled Date/Time | mg/L       | °C                  | mV                      | µS/cm                           | pH Units   |
| MW135    | 9.0-9.5 | 16/06/2018        | 0.25       | 28.6                | -102.8                  | 51772                           | 7.26       |
| MW135    | 2.5-3.0 | 29/11/2019        | 2.05       | 29                  | -4.8                    | 31727                           | 7.19       |
| MW135    | 2.5-3.0 | 25/06/2020        | 1.97       | 25.6                | -73.8                   | 33200                           | 7.38       |
| MW135    | 2.5-3.0 | 21/11/2020        | 1.76       | 28.2                | -44.2                   | 38656                           | 7.37       |
| MW135    | 2.5-3.0 | 24/06/2021        | 2.48       | 25.7                | -13.9                   | 33920                           | 6.64       |
| MW135    | 6.5-7.0 | 18/01/2022        | 1.79       | 27.4                | -19.9                   | 35542                           | 7.54       |
| MW135    | 2.5-3.0 | 23/06/2022        | 3.28       | 26.5                | 44.2                    | 35374                           | 7.81       |
| MW137    |         | 16/06/2018        | 0.41       | 28.8                | 21.1                    | 88093                           | 7.33       |
| MW137    | 0.8-1.3 | 16/06/2018        | 2.6        | 25.8                | 80.3                    | 82500                           | 7.34       |
| MW137    | 2.5-3.0 | 16/06/2018        | 0.39       | 28.6                | 63.9                    | 82155                           | 7.12       |
| MW137    | 4.5-5.0 | 16/06/2018        | 0.84       | 28.3                | 70.3                    | 87361                           | 7.33       |
| MW137    | 4.5-5.0 | 29/11/2019        | 2          | 28.9                | 35.7                    | 44424                           | 7.46       |
| MW137    | 2.5-3.0 | 24/06/2020        | 1.92       | 24.2                | 55.2                    | 78192                           | 7.77       |
| MW137    | 2.5-3.0 | 20/11/2020        | 0.56       | 30.5                | 191.3                   | 78837                           | 7.51       |
| MW137    | 2.5-3.0 | 24/06/2021        | 2.77       | 25.6                | 13.1                    | 73157                           | 7.68       |
| MW137    | 2.5-3.0 | 18/01/2022        | 3.99       | 32.7                | -30.8                   | 41303                           | 7.48       |
| MW137    | 0.8-1.3 | 22/06/2022        | 1.21       | 25.9                | -186.1                  | 82874                           | 7.36       |
| MW138    | 5.0-5.5 | 12/03/2018        | 0.75       | 30                  | -190.4                  | 79067                           | 7.38       |
| MW138    | 7.0-7.5 | 12/03/2018        | 0.55       | 30                  | -103.2                  | 83497                           | 7.36       |
| MW138    | 9.0-9.5 | 12/03/2018        | 0.66       | 30.2                | -175.4                  | 72441                           | 7.38       |
| MW138    | 3.0-3.5 | 16/06/2018        | 3.56       | 29.4                | -19                     | 40029                           | 7.57       |
| MW138    | 5.0-5.5 | 16/06/2018        | 0.21       | 29.9                | -84.2                   | 95278                           | 7.07       |
| MW138    | 7.0-7.5 | 16/06/2018        | 0.07       | 29.6                | -119.1                  | 103810                          | 6.91       |
| MW138    | 9.0-9.5 | 16/06/2018        | 0.14       | 29.5                | -122.8                  | 109663                          | 7.04       |
| MW138    | 5.0-5.5 | 29/11/2019        | 1.95       | 29.4                | -18.6                   | 72287                           | 7.31       |
| MW138    | 3.0-3.5 | 24/06/2020        | 0.75       | 29.4                | -99.1                   | 78021                           | 7.36       |
| MW138    | 7.0-7.5 | 20/11/2020        | 1.12       | 29.6                | 232.9                   | 55967                           | 7.71       |
| MW138    | 3.0-3.5 | 24/06/2021        | 0.85       | 27.4                | -177.2                  | 41420                           | 7.31       |
| MW138    | 3.0-3.5 | 18/01/2022        | 2.36       | 30.5                | -172.1                  | 43189                           | 7.4        |
| MW138    | 3.0-3.5 | 22/06/2022        | 2.77       | 27.9                | 71                      | 44998                           | 7.39       |
| MW139    | -       | 16/06/2018        | 0.05       | 29.6                | 80.5                    | 83408                           | 6.89       |
| MW139    | -       | 29/11/2019        | 3.99       | 29.4                | 16.3                    | 41690                           | 7.57       |
| MW139    | -       | 24/06/2020        | 1.24       | 25.7                | 66                      | 71923                           | 7.07       |
| MW139    | -       | 21/11/2020        | 0.64       | 28.2                |                         | 53232                           | 9.83       |
| MW139    | -       | 24/06/2021        | 0.45       | 25.8                | 126                     | 69914                           | 6.99       |
| MW139    | -       | 18/01/2022        | 1.11       | 28.4                | -67.8                   | 63060                           | 7.12       |
| MW139    | -       | 22/06/2022        | 0.4        | 29.9                | 38.3                    | 67196                           | 6.95       |
| MW140    | 1.5-2.0 | 16/06/2018        | 0.22       | 27                  | 3.7                     | 103198                          | 7.02       |
| MW140    | 3.5-4.0 | 16/06/2018        | 0.23       | 28.7                | 7.7                     | 105617                          | 6.94       |
| MW140    | 6.0-6.5 | 16/06/2018        | 0.04       | 28.5                | -49.1                   | 97766                           | 6.89       |
| MW140    | 8.5-9.0 | 16/06/2018        | 0.04       | 28.5                | -88.6                   | 87081                           | 6.96       |
| MW140    | 3.5-4.0 | 29/11/2019        | 9.5        | 29                  | 214                     | 938                             | 6.7        |
| MW140    | 3.5-4.0 | 24/06/2020        | 1.97       | 25.2                | -22.2                   | 97682                           | 7.52       |
| MW140    | 3.5-4.0 | 20/11/2020        | 0.93       | 28                  | -83.6                   | 104111                          | 6.62       |
| MW140    | 6.0-6.5 | 24/06/2021        | 2.67       | 23.5                | 123.2                   | 98966                           | 7.62       |
| MW140    | 3.5-4.0 | 18/01/2022        | 2.51       | 27.8                | 141.4                   | 100090                          | 7.94       |
| MW140    | 1.5-2.0 | 23/06/2022        | 3.04       | 24.4                | 47.4                    | 53588                           | 7.71       |
| MW141    | 1.5-2.0 | 8/03/2018         | 2.45       | 31.2                | -144                    | 38330                           | 7.32       |
| MW141    | 3.0-3.5 | 8/03/2018         | 0.25       | 30.1                | -160.9                  | 39699                           | 7.07       |
| MW141    | 5.0-5.5 | 8/03/2018         | 1.1        | 30.2                | -212.2                  | 40295                           | 7.53       |
| MW141    | 7.0-7.5 | 8/03/2018         | 0.71       | 29.8                | -209.4                  | 41836                           | 7.67       |
| MW141    | 1.5-2.0 | 16/06/2018        | 2.08       | 29.2                | 39.4                    | 35926                           | 7.42       |
| MW141    | 3.0-3.5 | 16/06/2018        | 0.13       | 28.1                | -90.1                   | 37426                           | 6.97       |
| MW141    | 5.0-5.5 | 16/06/2018        | 0.06       | 28.2                | -221.9                  | 41130                           | 7.14       |
| MW141    | 7.0-7.5 | 16/06/2018        | 0.23       | 28.1                | -129.4                  | 49665                           | 7.28       |
| MW141    | 3.0-3.5 | 29/11/2019        | 1.78       | 30.9                | -398.5                  | 43833                           | 7.18       |
| MW141    | 3.0-3.5 | 24/06/2020        | 1.01       | 24.7                | -107.4                  | 35323                           | 7.38       |
| MW141    | 3.0-3.5 | 20/11/2020        | 0.65       | 28.3                | -134.1                  | 37786                           | 6.93       |
| MW141    | 7.0-7.5 | 24/06/2021        | 1.51       | 24.8                | -80.6                   | 19068                           | 7.26       |
| MW141    | 5.0-5.5 | 18/01/2022        | 2.34       | 27.3                | 124.6                   | 47332                           | 7.75       |
| MW141    | 1.5-2.0 | 23/06/2022        | 2.85       | 24.6                | 51.4                    | 40799                           | 7.66       |

|          |         |                   | DO (Field) | Temperature (Field) | Redox Potential (Field) | Electrical Conductivity (field) | pH (Field) |
|----------|---------|-------------------|------------|---------------------|-------------------------|---------------------------------|------------|
| Location | Well    | Sampled Date/Time | mg/L       | °C                  | mV                      | µS/cm                           | pH Units   |
| MW143    | 3.0-3.5 | 10/03/2018        | 1.06       | 32.7                | 48.5                    | 98591                           | 7.37       |
| MW143    | 5.0-5.5 | 10/03/2018        | 0.49       | 31.9                | 13                      | 98077                           | 7.34       |
| MW143    | 7.0-7.5 | 10/03/2018        | 0.57       | 31.4                | -27.9                   | 98362                           | 7.37       |
| MW143    | 9.0-9.5 | 10/03/2018        | 0.73       | 31.7                | 50.4                    | 91130                           | 7.41       |
| MW143    | 3.0-3.5 | 16/06/2018        | 0.7        | 29.3                | 17.6                    | 107233                          | 7.03       |
| MW143    | 5.0-5.5 | 16/06/2018        | 0.28       | 30.4                | 3.8                     | 111083                          | 6.85       |
| MW143    | 7.0-7.5 | 16/06/2018        | 0.14       | 30.1                | -145.7                  | 111884                          | 6.8        |
| MW143    | 9.0-9.5 | 16/06/2018        | 0.4        | 29.9                | -65.9                   | 112784                          | 7          |
| MW143    | 3.0-3.5 | 29/11/2019        | 1.69       | 31.2                | -12.4                   | 96237                           | 6.92       |
| MW143    | 3.0-3.5 | 25/06/2020        | 1.81       | 26.3                | 52.4                    | 87884                           | 7.67       |
| MW143    | 3.0-3.5 | 20/11/2020        | 1.69       | 31.4                | 128.7                   | 86887                           | 7.51       |
| MW143    | 3.0-3.5 | 24/06/2021        | 4.19       | 28.1                | 132.4                   | 49386                           | 6.76       |
| MW143    | 3.0-3.5 | 18/01/2022        | 38.4       | 28.9                | 114.9                   | 45293                           | 7.34       |
| MW143    | 3.0-3.5 | 22/06/2022        | 3.77       | 27.7                | 38.2                    | 87832                           | 7.56       |
| MW144    | 3.0-3.5 | 8/03/2018         | 0.52       | 30.3                | -96.1                   | 44616                           | 7.37       |
| MW144    | 5.0-5.5 | 8/03/2018         | 1.27       | 29.6                | -185.9                  | 47463                           | 7.2        |
| MW144    | 7.0-7.5 | 8/03/2018         | 0.2        | 29.5                | -133.1                  | 58350                           | 7.25       |
| MW144    | 9.0-9.5 | 8/03/2018         | 0.36       | 29.6                | -131.6                  | 62608                           | 7.33       |
| MW144    | 3.0-3.5 | 16/06/2018        | 0.39       | 28.3                | -35.4                   | 45637                           | 7.26       |
| MW144    | 5.0-5.5 | 16/06/2018        | 0.11       | 29                  | -116.3                  | 52917                           | 6.95       |
| MW144    | 7.0-7.5 | 16/06/2018        | 0.1        | 28.6                | -119.9                  | 69979                           | 6.93       |
| MW144    | 9.0-9.5 | 16/06/2018        | 0.16       | 28.7                | -148.3                  | 82470                           | 7.02       |
| MW144    | 3.0-3.5 | 29/11/2019        | 1.16       | 29.2                | -39.5                   | 38912                           | 7.02       |
| MW144    | 3.0-3.5 | 25/06/2020        | 2.07       | 25.8                | 8.5                     | 36675                           | 7.41       |
| MW144    | 3.0-3.5 | 20/11/2020        | 1.65       | 31.2                | 76.8                    | 40485                           | 7.52       |
| MW144    | 3.0-3.5 | 24/06/2021        | 3.78       | 25.3                | -87.7                   | 18402                           | 6.4        |
| MW144    | 3.0-3.5 | 18/01/2022        | 2.75       | 28.4                | 27.3                    | 36853                           | 7.41       |
| MW144    | 3.0-3.5 | 22/06/2022        | 3.77       | 27.2                | 30.8                    | 37044                           | 7.8        |
| MW145    | 3.0-3.5 | 12/03/2018        | 0.89       | 30.8                | 34.6                    | 102556                          | 7.3        |
| MW145    | 5.0-5.5 | 12/03/2018        | 0.76       | 30                  | -101.6                  | 108700                          | 7.33       |
| MW145    | 7.0-7.5 | 12/03/2018        | 0.52       | 29.7                | -72.5                   | 109440                          | 7.29       |
| MW145    | 9.0-9.5 | 12/03/2018        | 0.88       | 29.7                | 12.8                    | 110602                          | 7.34       |
| MW145    | 3.0-3.5 | 16/06/2018        | 1.73       | 29.4                | -8.4                    | 117162                          | 7.11       |
| MW145    | 5.0-5.5 | 16/06/2018        | 0.35       | 29.5                | -155.7                  | 126524                          | 6.91       |
| MW145    | 7.0-7.5 | 16/06/2018        | 0.31       | 29.2                | -169.3                  | 128342                          | 6.92       |
| MW145    | 9.0-9.5 | 16/06/2018        | 0.27       | 29.5                | -166.5                  | 129517                          | 6.95       |
| MW145    | 5.0-5.5 | 29/11/2019        | 1.85       | 33                  | -329.5                  | 116387                          | 7.05       |
| MW145    | 3.0-3.5 | 24/06/2020        | 0.61       | 25.4                | -71                     | 52412                           | 7.24       |
| MW145    | 5.0-5.5 | 20/11/2020        | 1.46       | 31.1                | 187                     | 97272                           | 7.39       |
| MW145    | 5.0-5.5 | 24/06/2021        | 2.78       | 23.6                | 1.1                     | 54865                           | 7.15       |
| MW145    | 5.0-5.5 | 18/01/2022        | 2.49       | 29.9                | 5.5                     | 57770                           | 7.36       |
| MW145    | 3.0-3.5 | 22/06/2022        | 3.16       | 28.3                | 75.8                    | 94315                           | 7.18       |
| MW146    | 3.0-3.5 | 8/03/2018         | 1.95       | 32.7                | 23.3                    | 103882                          | 7.48       |
| MW146    | 4.5-5.0 | 8/03/2018         | 0.96       | 31.9                | -30.5                   | 108809                          | 7.38       |
| MW146    | 7.0-7.5 | 8/03/2018         | 0.55       | 30.7                | -97.8                   | 113553                          | 7.32       |
| MW146    | 9.0-9.5 | 8/03/2018         | 0.88       | 30.8                | -76                     | 116664                          | 7.35       |
| MW146    | 3.0-3.5 | 16/06/2018        | 0.3        | 29                  | -13.5                   | 113137                          | 6.91       |
| MW146    | 4.5-5.0 | 16/06/2018        | 0.53       | 28.9                | -82.3                   | 113502                          | 6.83       |
| MW146    | 7.0-7.5 | 16/06/2018        | 0.17       | 29.7                | -173.9                  | 130377                          | 6.77       |
| MW146    | 9.0-9.5 | 16/06/2018        | 0.23       | 28.5                | -131.5                  | 130943                          | 6.96       |
| MW146    | 4.5-5.0 | 29/11/2019        | 2.32       | 29.7                | 7                       | 48507                           | 7.33       |
| MW146    | 4.5-5.0 | 24/06/2020        | 1.77       | 27.8                | 3.5                     | 100780                          | 7.33       |
| MW146    | 4.5-5.0 | 21/11/2020        | 4.75       | 27.4                | 73                      | 102759                          | 6.94       |
| MW146    | 4.5-5.0 | 24/06/2021        | 2.5        | 25.8                | 28                      | 50435                           | 7.58       |
| MW146    | 3.0-3.5 | 18/01/2022        | 3          | 29.4                | -15.7                   | 98004                           | 7.39       |
| MW146    | 3.0-3.5 | 22/06/2022        | 2.53       | 27.5                | 29.5                    | 47830                           | 7.57       |
| MW147    | 3.0-3.5 | 8/03/2018         | 0.59       | 32.1                | -81.6                   | 112080                          | 7.23       |
| MW147    | 5.0-5.5 | 8/03/2018         | 0.41       | 31.1                | -133.4                  | 110606                          | 7.27       |
| MW147    | 7.0-7.5 | 8/03/2018         | 0.95       | 31                  | -113.6                  | 111222                          | 7.33       |
| MW147    | 9.0-9.5 | 8/03/2018         | 0.64       | 31.8                | -151.4                  | 111599                          | 7.4        |
| MW147    | 3.0-3.5 | 16/06/2018        | 0.22       | 28.4                | -10.5                   | 104900                          | 7.04       |

|          |         |                   | DO (Field) | Temperature (Field) | Redox Potential (Field) | Electrical Conductivity (field) | pH (Field) |
|----------|---------|-------------------|------------|---------------------|-------------------------|---------------------------------|------------|
| Location | Well    | Sampled Date/Time | mg/L       | °C                  | mV                      | µS/cm                           | pH Units   |
| MW147    | 5.0-5.5 | 16/06/2018        | 0.11       | 29                  | -79.6                   | 106650                          | 6.97       |
| MW147    | 7.0-7.5 | 16/06/2018        | 0.07       | 29.3                | -109.3                  | 108700                          | 6.97       |
| MW147    | 9.0-9.5 | 16/06/2018        | 0          | 28.9                | -120.9                  | 104776                          | 7.01       |
| MW147    | 3.0-3.5 | 29/11/2019        | 2.22       | 28.1                | 429                     | 583                             | 7.29       |
| MW147    | 3.0-3.5 | 24/06/2020        | 1.55       | 25.7                | -10.6                   | 97183                           | 7.15       |
| MW147    | 5.0-5.5 | 20/11/2020        | 1.06       | 29                  | 30.7                    | 109345                          | 7.13       |
| MW147    | 5.0-5.5 | 24/06/2021        | 1.8        | 25.4                | 156.8                   | 102851                          | 7.25       |
| MW147    | 3.0-3.5 | 18/01/2022        | 3.46       | 28.9                | 4.7                     | 101218                          | 7.36       |
| MW147    | 3.0-3.5 | 23/06/2022        | 1.98       | 26.4                | 40.5                    | 101321                          | 7.45       |
| MW148D   | -       | 15/06/2018        | 0.09       | 29.3                | 87.3                    | 46767                           | 6.82       |
| MW148D   | -       | 15/06/2018        | 0.04       | 28.9                | 86.2                    | 93615                           | 6.87       |
| MW148D   | -       | 2/12/2019         | 3.18       | 29.6                | -225.8                  | 80452                           | 7.42       |
| MW148D   | -       | 24/06/2020        | 0.44       | 28.7                | -241.6                  | 85665                           | 7.14       |
| MW148D   | -       | 19/11/2020        | 0.97       | 30.7                | -129.7                  | 94652                           | 7.27       |
| MW148D   | -       | 23/06/2021        | 2.21       | 26.1                | -4.3                    | 77031                           | 7.6        |
| MW148D   | -       | 18/01/2022        | 0.67       | 28.3                | 76.3                    | 80379                           | 7.26       |
| MW148D   | -       | 22/06/2022        | 1.17       | 27.3                | 24                      | 79860                           | 7.05       |
| MW148S   | -       | 2/12/2019         | 3.01       | 29.6                | -14.9                   | 24240                           | 6.85       |
| MW148S   | -       | 24/06/2020        | 0.55       | 28.9                | 6.79                    | 50307                           | 6.79       |
| MW148S   | -       | 19/11/2020        | 0.62       | 29.3                | 67.2                    | 53311                           | 6.63       |
| MW148S   | -       | 23/06/2021        | 1.04       | 27.8                | 36.8                    | 43357                           | 6.91       |
| MW148S   | -       | 18/01/2022        | 0.7        | 27.1                | 113.5                   | 38882                           | 6.94       |
| MW148S   | -       | 22/06/2022        | 3.35       | 26.2                | 22.2                    | 34512                           | 7.29       |
| MW151    | -       | 18/06/2018        | 0.36       | 28.8                | 135.5                   | 10900                           | 7.17       |
| MW151    | -       | 16/03/2020        | 1.2        | 32                  |                         | 7707                            | 7.7        |
| MW151    | -       | 24/06/2020        | 0.98       | 28.5                | 50.2                    | 11990                           | 7.19       |
| MW151    | -       | 19/11/2020        | 2.93       | 30.1                | 31.4                    | 16411                           | 6.84       |
| MW151    | -       | 23/06/2021        | 1.78       | 25.1                | 105                     | 12800                           | 7.17       |
| MW151    | -       | 18/01/2022        | 1.96       | 29.7                | 85.6                    | 16319                           | 7.14       |
| MW151    | -       | 22/06/2022        | 1.69       | 26.1                | 51.3                    | 14797                           | 6.97       |
| MW159    | -       | 15/06/2018        | 0.26       | 29.6                | 118.6                   | 27809                           | 7          |
| MW159    | -       | 29/11/2019        | 1.24       | 30.1                | 3.7                     | 27610                           | 6.98       |
| MW159    | -       | 16/03/2020        | 0.64       | 33.3                |                         | 25820                           | 6.66       |
| MW159    | -       | 24/06/2020        | 3.22       | 29.8                | 150.7                   | 25707                           | 7.07       |
| MW159    | -       | 20/11/2020        | 1.8        | 29.1                | 21.1                    | 31172                           | 6.79       |
| MW159    | -       | 23/06/2021        | 2.35       | 27                  | 77.5                    | 29611                           | 7.16       |
| MW159    | -       | 23/11/2021        | 1.03       | 30                  | -23.3                   | 81407                           | 6.82       |
| MW159    | -       | 18/01/2022        | 0.98       | 29.9                | -24                     | 28563                           | 6.84       |
| MW159    | -       | 22/06/2022        | 0.87       | 28                  | 35.6                    | 21763                           | 6.79       |
| MW162    | -       | 15/06/2018        | 0.21       | 29.3                | -85.4                   | 14595                           | 6.84       |
| MW162    | -       | 26/11/2019        | 4.71       | 30                  | 20.9                    | 12600                           | 6.96       |
| MW162    | -       | 24/06/2020        | 1.67       | 27.8                | -65.5                   | 13050                           | 6.91       |
| MW162    | -       | 15/10/2020        | 0.35       | 30.1                | -205.7                  | 13867                           | 7.07       |
| MW162    | -       | 19/11/2020        | 2.84       | 29                  | 64.5                    | 13989                           | 7.52       |
| MW162    | -       | 23/02/2021        | 0.2        | 31.8                | -119                    | 14621                           | 7.06       |
| MW162    | -       | 23/06/2021        | 0.84       | 25.3                | 165.1                   | 13319                           | 6.96       |
| MW162    | -       | 18/01/2022        | 2.89       | 32                  | 77.1                    | 1801                            | 8.25       |
| MW162    | -       | 22/06/2022        | 0.75       | 28.9                | 20.7                    | 12776                           | 7.18       |
| MW163    | -       | 15/06/2018        | 0.14       | 29.2                | -85                     | 13947                           | 7          |
| MW163    | -       | 26/11/2019        | 10.7       | 29.2                | 15.3                    | 7935                            | 6.6        |
| MW163    | -       | 24/06/2020        | 1.46       | 26.6                | -135.8                  | 13809                           | 6.8        |
| MW163    | -       | 19/11/2020        | 2.69       | 32.1                | 26.6                    | 17922                           | 7.13       |
| MW163    | -       | 23/06/2021        | 2.43       | 23.7                | 91.6                    | 12160                           | 7.4        |
| MW163    | -       | 18/01/2022        | 1.92       | 28.8                | 101.8                   | 12802                           | 7.21       |
| MW163    | -       | 22/06/2022        | 2.06       | 28.8                | -57.2                   | 14218                           | 7.36       |
| MW164    | -       | 15/06/2018        | 0.46       | 29.2                | 84.9                    | 17210                           | 6.68       |
| MW164    | -       | 26/11/2019        | 1.83       | 29.6                | 15.7                    | 13636                           | 6.77       |
| MW164    | -       | 24/06/2020        | 1.27       | 27.5                | -70.3                   | 13985                           | 6.71       |
| MW164    | -       | 19/11/2020        | 1.88       | 31.6                | -33.1                   | 9727                            | 7.91       |
| MW164    | -       | 23/06/2021        | 1.81       | 25.2                | 108                     | 7078                            | 7.8        |
| MW164    | -       | 18/01/2022        | 1.71       | 29.5                | -55.5                   | 14464                           | 7.15       |



|          |         |                   | DO (Field) | Temperature (Field) | Redox Potential (Field) | Electrical Conductivity (field) | pH (Field) |
|----------|---------|-------------------|------------|---------------------|-------------------------|---------------------------------|------------|
| Location | Well    | Sampled Date/Time | mg/L       | °C                  | mV                      | µS/cm                           | pH Units   |
| MW164    | -       | 22/06/2022        | 2.5        | 29.7                | -103.4                  | 7102                            | 7.69       |
| MW165    | -       | 10/06/2018        | 1.08       | 27.1                | 73.7                    | 2399                            | 7.84       |
| MW165    | -       | 26/11/2019        | 3.12       | 29.8                | 4.2                     | 2319                            | 6.84       |
| MW165    | -       | 24/06/2020        | 2.02       | 27.6                | -127                    | 2381                            | 7.72       |
| MW165    | -       | 19/11/2020        | 2.04       | 30.2                | 109.1                   | 2633                            | 8.21       |
| MW165    | -       | 23/06/2021        | 2.02       | 23.6                | 117.6                   | 3801                            | 7.94       |
| MW165    | -       | 18/01/2022        | 3.12       | 26.6                | 117.9                   | 2727                            | 7.93       |
| MW165    | -       | 22/06/2022        | 1.99       | 26.8                | -162.2                  | 3665                            | 8.06       |
| MW166    | -       | 10/06/2018        | 0.42       | 29.1                | 84.3                    | 3451                            | 7.61       |
| MW166    | -       | 26/11/2019        | 5.57       | 31.1                | 85.5                    | 3509                            | 7.63       |
| MW166    | -       | 24/06/2020        | 3.18       | 28.6                | -106.7                  | 2953                            | 7.63       |
| MW166    | -       | 19/11/2020        | 2.22       | 30.7                | 93.3                    | 3227                            | 7.91       |
| MW166    | -       | 23/06/2021        | 1.83       | 28.6                | 117.4                   | 3332                            | 7.77       |
| MW166    | -       | 18/01/2022        | 3.27       | 29.6                | 104.4                   | 2611                            | 7.91       |
| MW166    | -       | 22/06/2022        | 2.29       | 26.5                | -144.8                  | 2883                            | 7.86       |
| MW167    | -       | 10/06/2018        | 1.06       | 28.8                | 104.3                   | 6829                            | 7.17       |
| MW167    | -       | 26/11/2019        | 6.69       | 30.7                | 88.1                    | 6734                            | 7.26       |
| MW167    | -       | 25/06/2020        | 1.6        | 29.7                | 44.4                    | 5909                            | 7.36       |
| MW167    | -       | 19/11/2020        | 1.98       | 32.7                | 59.3                    | 6335                            | 7.57       |
| MW167    | -       | 23/06/2021        | 2.16       | 25                  | 151.6                   | 7066                            | 7.37       |
| MW167    | -       | 18/01/2022        | 2.51       | 30                  | 110.6                   | 5437                            | 7.42       |
| MW167    | -       | 22/06/2022        | 2.52       | 27.8                | -161.1                  | 5297                            | 7.54       |
| MW168    | -       | 10/06/2018        | 0.43       | 28.9                | 105.6                   | 14149                           | 6.78       |
| MW168    | -       | 26/11/2019        | 3.98       | 30.9                | 95.5                    | 14772                           | 6.72       |
| MW168    | -       | 25/06/2020        | 1          | 30.2                | 43.6                    | 14593                           | 6.88       |
| MW168    | -       | 19/11/2020        | 1.86       | 29.6                | 69.7                    | 13910                           | 7.14       |
| MW168    | -       | 23/06/2021        | 1.18       | 26.1                | 73.1                    | 13890                           | 6.99       |
| MW168    | -       | 18/01/2022        | 1.31       | 30.2                | 150.2                   | 12849                           | 6.94       |
| MW168    | -       | 22/06/2022        | 1.26       | 26.6                | -165.5                  | 12256                           | 7          |
| MW170    | -       | 18/06/2018        | 0.09       | 28.6                | 70.4                    | 62293                           | 6.71       |
| MW170    | -       | 29/11/2019        | 2.5        | 29.1                | -70.2                   | 22523                           | 7.02       |
| MW170    | -       | 24/06/2020        | 0.92       | 28.5                | 117.2                   | 51001                           | 6.98       |
| MW170    | -       | 16/10/2020        | 2.5        | 29.1                | 158.8                   | 48196                           | 6.7        |
| MW170    | -       | 19/11/2020        | 5.28       | 27.7                | 1.6                     | 48116                           | 6.7        |
| MW170    | -       | 24/02/2021        | 1.41       | 32                  | 48                      | 51157                           | 7.07       |
| MW170    | -       | 23/06/2021        | 2.39       | 23.2                | 81.8                    | 48493                           | 6.95       |
| MW170    | -       | 23/11/2021        | 2.55       | 29.9                | -29.3                   | 43860                           | 7.07       |
| MW170    | -       | 18/01/2022        | 3.21       | 29                  | 116.6                   | 40988                           | 7          |
| MW170    | -       | 22/06/2022        | 2.8        | 28.1                | 38                      | 41372                           | 7.14       |
| MW172    | -       | 18/06/2018        | 2.59       | 30.7                | 82.8                    | 54405                           | 6.84       |
| MW172    | -       | 29/11/2019        | 4.06       | 27.9                | -33.4                   | 21488                           | 7.48       |
| MW172    | -       | 24/06/2020        | 3.57       | 30                  | 126.4                   | 38531                           | 7.24       |
| MW172    | -       | 23/06/2021        | 4.09       | 24.7                | 48.1                    | 18584                           | 7.17       |
| MW172    | -       | 18/01/2022        | 2.2        | 29                  | 108.4                   | 35750                           | 7.01       |
| MW172    | -       | 22/06/2022        | 2.17       | 29.3                | 47.9                    | 33497                           | 7.04       |
| MW175    | 4.0-4.5 | 17/06/2018        | 0.57       | 28.6                | -32.9                   | 11216                           | 7.3        |
| MW175    | 5.5-6.0 | 17/06/2018        | 0.36       | 28.8                | 47.2                    | 14908                           | 7.41       |
| MW175    | 7.0-7.5 | 17/06/2018        | 0.3        | 28.6                | -58.5                   | 8520                            | 7.61       |
| MW175    | 9.0-9.5 | 17/06/2018        | 0.14       | 28.4                | 20.3                    | 31725                           | 7.25       |
| MW175    | 5.5-6.0 | 29/11/2019        | 1.76       | 29.3                | -19.7                   | 6926                            | 7.57       |
| MW175    | 5.5-6.0 | 25/06/2020        | 0.59       | 25                  | -78.9                   | 3133                            | 7.75       |
| MW175    | 5.5-6.0 | 20/11/2020        | 2.05       | 30                  | -107.5                  | 3878                            | 7.55       |
| MW175    | 7.0-7.5 | 23/06/2021        | 1.57       | 25.6                | -254.9                  | 2580                            | 7.77       |
| MW175    | 5.5-6.0 | 18/01/2022        | 0.76       | 28.6                | -122.7                  | 4932                            | 7.52       |
| MW175    | 4.0-4.5 | 23/06/2022        | 1.35       | 27.6                | -108.5                  | 3485                            | 7.82       |
| MW176    | 1.5-2.0 | 17/06/2018        | 0.25       | 27.3                | -30.1                   | 56663                           | 7.1        |
| MW176    | 3.5-4.0 | 17/06/2018        | 0.16       | 28.9                | -108.9                  | 63977                           | 7.13       |
| MW176    | 6.0-6.5 | 17/06/2018        | 0.13       | 28.5                | -97.4                   | 69540                           | 7.06       |
| MW176    | 8.5-9.0 | 17/06/2018        | 0.01       | 28.6                | -113.3                  | 104479                          | 6.99       |
| MW176    | 3.5-4.0 | 29/11/2019        | 0.88       | 33.1                | -71                     | 50091                           | 7.15       |
| MW176    | 1.5-2.0 | 24/06/2020        | 3.47       | 24.7                | 64                      | 41708                           | 8.01       |

|          |         |                   | DO (Field) | Temperature (Field) | Redox Potential (Field) | Electrical Conductivity (field) | pH (Field) |
|----------|---------|-------------------|------------|---------------------|-------------------------|---------------------------------|------------|
| Location | Well    | Sampled Date/Time | mg/L       | °C                  | mV                      | µS/cm                           | pH Units   |
| MW176    | 1.5-2.0 | 20/11/2020        | 3.13       | 30.8                | 15.5                    | 54030                           | 7.39       |
| MW176    | 3.5-4.0 | 23/06/2021        | 4.09       | 24.6                | 71.3                    | 31.808                          | 8          |
| MW176    | 6.0-6.5 | 18/01/2022        | 2.61       | 28                  | 99.9                    | 68441                           | 7.91       |
| MW176    | 1.5-2.0 | 23/06/2022        | 2.55       | 24                  | 89.7                    | 53753                           | 7.47       |
| MW177    | 1.5-2.0 | 17/06/2018        | 0.2        | 26.6                | 2.3                     | 83509                           | 7.16       |
| MW177    | 3.5-4.0 | 17/06/2018        | 0.08       | 28.5                | -50.6                   | 113763                          | 7.06       |
| MW177    | 6.0-6.5 | 17/06/2018        | 0.07       | 28.3                | -90.8                   | 110799                          | 7.06       |
| MW177    | 8.5-9.0 | 17/06/2018        | 0.01       | 28                  | -111.3                  | 100576                          | 7.09       |
| MW177    | 1.5-2.0 | 29/11/2019        | 1.73       | 29.4                | -24.1                   | 73791                           | 7.01       |
| MW177    | 1.5-2.0 | 24/06/2020        | 2.58       | 27                  | 18.7                    | 77445                           | 7.52       |
| MW177    | 1.5-2.0 | 20/11/2020        | 2.24       | 29.7                | -5.7                    | 84902                           | 7.49       |
| MW177    | 3.5-4.0 | 23/06/2021        | 2.97       | 24.2                | 51.5                    | 71736                           | 7.42       |
| MW177    | 3.5-4.0 | 18/01/2022        | 2.62       | 28.6                | 87.9                    | 94268                           | 7.86       |
| MW177    | 1.5-2.0 | 23/06/2022        | 1.49       | 24.6                | 69                      | 91072                           | 7.2        |
| MW178    | 2.0-2.5 | 17/06/2018        | 0.12       | 27.9                | -84.5                   | 94559                           | 7.05       |
| MW178    | 4.0-4.5 | 17/06/2018        | 0.11       | 28.9                | -93.9                   | 94355                           | 7.08       |
| MW178    | 7.0-7.5 | 17/06/2018        | 0.09       | 28.7                | -95.5                   | 89268                           | 7.17       |
| MW178    | 9.0-9.5 | 17/06/2018        | 0.07       | 28.5                | -68.9                   | 80461                           | 7.13       |
| MW178    | 4.0-4.5 | 29/11/2019        | 0.43       | 31.7                | -23.7                   | 98968                           | 7.18       |
| MW178    | 2.0-2.5 | 24/06/2020        | 2.55       | 25                  | 73.6                    | 86481                           | 7.66       |
| MW178    | 4.0-4.5 | 20/11/2020        | 1.62       | 30.2                | 186.5                   | 89899                           | 7.55       |
| MW178    | 4.0-4.5 | 24/06/2021        | 4.29       | 22.6                | 0.5                     | 85879                           | 6.9        |
| MW178    | 9.0-9.5 | 18/01/2022        | 0.71       | 26.6                | -21.5                   | 90308                           | 7.36       |
| MW178    | 2.0-2.5 | 23/06/2022        | 3.9        | 22.6                | 109.7                   | 63338                           | 6.95       |
| MW179    | 3.2-3.7 | 16/06/2018        | 0.1        | 28.7                | -76.5                   | 59663                           | 7.21       |
| MW179    | 5.9-6.4 | 16/06/2018        | 0.06       | 28.7                | -78                     | 50874                           | 7.15       |
| MW179    | 8.5-9.0 | 16/06/2018        | 0.04       | 28.3                | -74.5                   | 74416                           | 7          |
| MW179    | 3.2-3.7 | 29/11/2019        | 1.79       | 32.6                | -191.5                  | 90064                           | 7.63       |
| MW179    | 1.0-1.5 | 24/06/2020        | 3.09       | 24.1                | 58                      | 75422                           | 7.76       |
| MW179    | 3.2-3.7 | 20/11/2020        | 1.64       | 30                  | 178.3                   | 46304                           | 7.82       |
| MW179    | 3.2-3.7 | 24/06/2021        | 10.85      | 18.2                | 34.5                    | 1260                            | 6.28       |
| MW179    | 3.2-3.7 | 18/01/2022        | 1.56       | 27.5                | -8.17                   | 79070                           | 7.45       |
| MW179    | 1.0-1.5 | 22/06/2022        | 2.46       | 26.1                | -107.9                  | 81954                           | 7.48       |
| MW180    | 1.0-1.5 | 17/06/2018        | 0.13       | 25.1                | 75.7                    | 83777                           | 7.13       |
| MW180    | 3.5-4.0 | 17/06/2018        | 0.23       | 27.1                | -39.5                   | 89229                           | 7.09       |
| MW180    | 6.0-6.5 | 17/06/2018        | 0.25       | 28                  | -74.6                   | 91447                           | 7.21       |
| MW180    | 8.5-9.0 | 17/06/2018        | 0.13       | 27.8                | -65.8                   | 90374                           | 7.04       |
| MW180    | 6.0-6.5 | 29/11/2019        | 0.98       | 31                  | -231.2                  | 89128                           | 7.38       |
| MW180    | 3.5-4.0 | 24/06/2020        | 0.55       | 24                  | -56.4                   | 89811                           | 7.32       |
| MW180    | 3.5-4.0 | 21/11/2020        | 1.09       | 27.7                | 78.3                    | 96847                           | 6.79       |
| MW180    | 1.0-1.5 | 24/06/2021        | 3.54       | 22.5                | 103.4                   | 62058                           | 7.59       |
| MW180    | 3.5-4.0 | 18/01/2022        | 2.2        | 28.3                | -61.7                   | 91645                           | 7.49       |
| MW180    | 1.0-1.5 | 23/06/2022        | 2.56       | 25.1                | 36.4                    | 91570                           | 7.47       |
| MW181    | 1.5-2.0 | 16/06/2018        | 1.24       | 27.6                | 47.4                    | 103968                          | 7.02       |
| MW181    | 3.5-4.0 | 16/06/2018        | 1.65       | 28.3                | 32.7                    | 106635                          | 7.18       |
| MW181    | 5.5-6.0 | 16/06/2018        | 0.16       | 29                  | -12                     | 107962                          | 6.74       |
| MW181    | 7.0-7.5 | 16/06/2018        | 0.07       | 29.1                | -60                     | 96186                           | 6.7        |
| MW181    | 3.5-4.0 | 29/11/2019        | 8.55       | 28.8                | 58.8                    | 1255                            | 7.15       |
| MW181    | 3.5-4.0 | 24/06/2020        | 1.91       | 23.8                | 50.6                    | 96553                           | 7.54       |
| MW181    | 1.5-2.0 | 20/11/2020        | 1.21       | 28.6                | 3.9                     | 108667                          | 6.76       |
| MW181    | 5.5-6.0 | 24/06/2021        | 1.35       | 23.7                | -3                      | 101852                          | 6.81       |
| MW181    | 3.5-4.0 | 18/01/2022        | 1.52       | 28.3                | 77.7                    | 103120                          | 7.21       |
| MW181    | 3.5-4.0 | 23/06/2022        | 1.78       | 25.9                | 38                      | 101760                          | 7.42       |
| MW211    | -       | 9/06/2018         | 3.98       | 29.6                | 64.5                    | 2260                            | 8.15       |
| MW211    | -       | 26/11/2019        | 9.28       | 30.5                | 13.5                    | 856                             | 8.1        |
| MW211    | -       | 24/06/2020        | 3.79       | 27.5                | -76.4                   | 2329                            | 7.96       |
| MW211    | -       | 14/10/2020        | 4.73       | 29.3                | 104.4                   | 2487                            | 7.9        |
| MW211    | -       | 19/11/2020        | 4.47       | 30.6                | 27.9                    | 2698                            | 8.23       |
| MW211    | -       | 23/02/2021        | 3.33       | 31.5                | 33.8                    | 2566                            | 8.21       |
| MW211    | -       | 23/06/2021        | 3.45       | 24.4                | 124.7                   | 2160                            | 8.25       |
| MW211    | -       | 23/11/2021        | 3.66       | 77.6                | 95.5                    | 2272                            | 8          |



|          |      |                   | DO (Field) | Temperature (Field) | Redox Potential (Field) | Electrical Conductivity (field) | pH (Field) |
|----------|------|-------------------|------------|---------------------|-------------------------|---------------------------------|------------|
| Location | Well | Sampled Date/Time | mg/L       | °C                  | mV                      | µS/cm                           | pH Units   |
| MW211    | -    | 18/01/2022        | 4.64       | 29.2                | 5.7                     | 2264                            | 8.43       |
| MW211    | -    | 22/06/2022        | 3.1        | 28.3                | -105.8                  | 2061                            | 8.3        |
| MW211    | -    | 31/10/2022        | 3.48       | 24.5                | 72.5                    | 2532                            | 7.21       |
| MW233    | -    | 10/06/2018        | 4.05       | 30.1                | 84.9                    | 2260                            | 7.93       |
| MW233    | -    | 15/10/2020        | 4.2        | 30.5                | 8.6                     | 2062                            | 8.18       |
| MW233    | -    | 23/02/2021        | 2.2        | 32.8                | 39.1                    | 2231                            | 7.99       |
| MW233    | -    | 23/06/2021        | 2.59       | 25.2                | 129.6                   | 1973                            | 8.27       |
| MW233    | -    | 23/11/2021        | 2.43       | 28.8                | 82.1                    | 1861                            | 8.22       |
| MW233    | -    | 18/01/2022        | 2.93       | 33.1                | 76.1                    | 1707                            | 8.24       |
| MW233    | -    | 22/06/2022        | 2.71       | 27.4                | 5.7                     | 1983                            | 8.3        |
| OTH103   |      | 1/12/2019         | 5.47       | 28.8                | -315.6                  | 27929                           | 8.14       |
| OTH103   |      | 20/11/2020        | 1.95       | 27.6                | -22.8                   | 63985                           | 7.83       |
| OTH103   |      | 23/06/2022        | 0.85       | 25.2                | -77.7                   | 53158                           | 7.85       |
| OTH103   |      | 23/11/2022        | 3.24       | 27.9                | 98.6                    | 54575                           | 7.89       |
| OTH106   |      | 29/11/2019        | 5.26       | 29                  | -17.3                   | 63803                           | 7.7        |
| OTH106   |      | 26/06/2020        | 5.42       | 20.3                | 39.3                    | 50871                           | 7.98       |
| OTH106   |      | 20/11/2020        | 3.59       | 31.2                | 63.5                    | 66414                           | 8.12       |
| OTH106   |      | 24/06/2021        | 6.29       | 15.1                | 131.7                   | 57455                           | 7.66       |
| OTH106   |      | 23/11/2022        | 4.66       | 24.8                | -95                     | 57508                           | 7.98       |
| OTH107   |      | 29/11/2019        | 71.5       | 30.9                | -426.8                  | 63173                           | 7.79       |
| OTH107   |      | 26/06/2020        | 5.41       | 20.7                | 35.5                    | 51084                           | 7.96       |
| OTH107   |      | 20/11/2020        | 4.42       | 26.8                | 59.1                    | 58999                           | 7.59       |
| OTH107   |      | 24/06/2021        | 6.21       | 16                  | 144.1                   | 57722                           | 6.77       |
| OTH107   |      | 23/06/2022        | 5.16       | 20.3                | 58.8                    | 53775                           | 7.79       |
| OTH107   |      | 23/11/2022        | 5.86       | 23.7                | -93.7                   | 56989                           | 8.17       |
| OTH103   |      | 23/06/2021        | 6.06       | 17.2                | -35.9                   | 36172                           | 7.92       |
| OTH129   |      | 1/12/2019         | 5.11       | 27.7                | -168.6                  | 58597                           | 8.09       |
| OTH129   |      | 20/11/2020        | 1.27       | 28.5                | -69.9                   | 68418                           | 7.76       |
| OTH129   |      | 23/06/2021        | 5.89       | 21.3                | 79.4                    | 58193                           | 8.19       |
| OTH129   |      | 23/06/2022        | 4.2        | 26.8                | 23.2                    | 32596                           | 7.96       |
| OTH129   |      | 23/11/2022        | 3.05       | 29.5                | 22                      | 53742                           | 7.74       |
| OTH132   |      | 1/12/2019         | 4.42       | 27.4                | -331.5                  | 56336                           | 8.13       |
| OTH106   |      | 23/06/2022        | 5.18       | 20.3                | 52.1                    | 54602                           | 8.06       |
| OTH132   |      | 20/11/2020        | 1.39       | 25.9                | -64.4                   | 63688                           | 7.87       |
| OTH132   |      | 23/06/2021        | 5.34       | 16.9                | 68.4                    | 56614                           | 8.06       |
| OTH132   |      | 23/06/2022        | 2.28       | 24.6                | 63.6                    | 54880                           | 7.68       |
| OTH132   |      | 23/11/2022        | 2.88       | 26.9                | 74.4                    | 53723                           | 6.95       |
| OTH134   |      | 1/12/2019         | 5.71       | 27.7                | -208.7                  | 44981                           | 8.09       |
| OTH134   |      | 20/11/2020        | 3.41       | 29.1                | 25.8                    | 69054                           | 7.86       |
| OTH134   |      | 23/06/2021        | 7.14       | 17.8                | 57.4                    | 30756                           | 8.06       |
| OTH134   |      | 23/06/2022        | 5.56       | 22.2                | 12.3                    | 2625                            | 8.45       |
| OTH134   |      | 23/11/2022        | 8.2        | 29.4                | 42                      | 53233                           | 7.63       |
| OTH103   |      | 28/06/2023        | 3.05       | 21                  | -134.9                  | 51978                           | 7.86       |
| OTH103   |      | 8/11/2023         | 2.25       | 26.1                | -52.4                   | 63528                           | 7.69       |
| OTH106   |      | 28/06/2023        | 6.58       | 15                  | 148.2                   | 40997                           | 7.94       |
| OTH106   |      | 8/11/2023         | 2.71       | 28.8                | -89.5                   | 57468                           | 7.79       |
| OTH107   |      | 28/06/2023        | 7.56       | 14.2                | 136.2                   | 37323                           | 7.92       |
| OTH107   |      | 8/11/2023         | 4.02       | 32.6                | -53.2                   | 57068                           | 3.06       |
| OTH129   |      | 28/06/2023        | 5.42       | 23.8                | -75.9                   | 62086                           | 8.36       |
| OTH129   |      | 8/11/2023         | 2.53       | 25.5                | 120.9                   | 59423                           | 7.75       |
| OTH132   |      | 28/06/2023        | 2.81       | 19.3                | -109.1                  | 58420                           | 7.83       |
| OTH132   |      | 8/11/2023         | 2.58       | 23.7                | 149.6                   | 60905                           | 7.67       |
| OTH134   |      | 28/06/2023        | 3.25       | 18.6                | -86.1                   | 58963                           | 7.8        |
| OTH134   |      | 8/11/2023         | 2.84       | 24.3                | 124.9                   | 57710                           | 7.82       |

|          |                   | DO (Field) | Temperature (Field) | Redox Potential (Field) | Electrical Conductivity<br>(field) | pH (Field) |
|----------|-------------------|------------|---------------------|-------------------------|------------------------------------|------------|
| Location | Sampled Date/Time | mg/L       | °C                  | mV                      | µS/cm                              | pH Units   |
| SW108    | 22/06/2022        | 5.19       | 24.5                | 38.9                    | 2377                               | 8.37       |
| SW125    | 8/11/2023         | 1.87       | 27.3                | -96.9                   | 1394                               | 7.74       |
| SW125    | 8/11/2023         | 1.87       | 27.3                | -96.9                   | 1394                               | 7.74       |
| SW157    | 17/05/2022        | 6.31       | 23.9                | 148.9                   | 8317                               |            |
| SW157    | 22/06/2022        | 7.89       | 26.5                | 28.3                    | 1872                               | 9.15       |
| SW170    | 17/05/2022        | 4.65       | 21                  | 195                     | 593                                | 5.95       |
| SW170    | 22/06/2022        | 3.63       | 20.6                | 36.6                    | 324                                | 8.61       |
| SW189    | 28/05/2020        | 6.63       | 17.8                | 98                      | 3534                               | 8.43       |
| SW189    | 4/03/2021         | 203        | 268                 | 922                     | 1216                               | 843        |
| SW189    | 24/06/2021        | 7.4        | 15.3                | 154.6                   | 1451                               | 7.25       |
| SW189    | 17/05/2022        | 4.98       | 21.8                | 199.2                   | 4307                               |            |
| SW189    | 23/06/2022        | 6.35       | 16.8                | 48.7                    | 1260                               | 7.49       |
| SW190    | 4/03/2021         | 126        | 320                 | 654                     | 758                                | 829        |
| SW190    | 23/06/2021        | 9.86       | 15.8                | 25.6                    | 5535                               | 8.83       |
| SW190    | 17/05/2022        | 5.51       | 22                  | 207.7                   | 5554                               |            |
| SW190    | 23/06/2022        | 6.16       | 25.8                | 18.3                    | 2607                               | 8.79       |
| SW192    | 18/05/2022        | 5.49       | 17.3                | 101.9                   | 40893                              | 8.14       |
| SW192    | 23/06/2022        | 4.15       | 22.9                | 26.9                    | 9358                               | 8.13       |
| SW193    | 28/05/2020        | 3.03       | 19.3                | 135.3                   | 33839                              | 7.85       |
| SW193    | 4/03/2021         | 188        | 340                 | 8966                    | 2587                               | 816        |
| SW193    | 23/06/2021        | 4.93       | 19.9                | 65.4                    | 50328                              | 8.27       |
| SW193    | 18/05/2022        | 5.26       | 17.3                | 98.5                    | 41281                              | 8.09       |
| SW193    | 23/06/2022        | 6.99       | 22.9                | 19.8                    | 2425                               | 8.43       |
| SW199    | 26/05/2020        | 1.16       | 22                  | 113.7                   | 526                                | 8.05       |
| SW199    | 4/03/2021         | 1.82       | 30.3                | 90                      | 727                                | 8.01       |
| SW199    | 22/06/2022        | 1.99       | 26.8                | 12.3                    | 2144                               | 7.68       |
| SW200    | 26/05/2020        | 11.83      | 17.8                | 114                     | 1900                               | 8.62       |
| SW200    | 4/03/2021         | 3.26       | 30                  | 115.6                   | 138.2                              | 8.15       |
| SW200    | 24/06/2021        | 7.47       | 17.1                | 58.2                    | 1357                               | 8.64       |
| SW200    | 22/06/2022        | 5.76       | 25.8                | 30.2                    | 253.4                              | 8.16       |
| SW205    | 27/05/2020        | 4.38       | 27.6                | 140.3                   | 60782                              | 8.37       |
| SW205    | 20/11/2020        | 3.41       | 33.7                | 61.2                    | 94981                              | 8.01       |
| SW205    | 4/03/2021         | 3.56       | 31.2                | 86.5                    | 54728                              | 8          |
| SW205    | 24/06/2021        | 6.06       | 16.1                | 99.1                    | 34521                              | 7.6        |
| SW205    | 17/05/2022        | 4.85       | 24.1                | 131                     | 57152                              |            |
| SW205    | 23/06/2022        | 4.21       | 20.4                | 50.9                    | 69153                              | 7.76       |
| SW205    | 23/11/2022        | 4.6        | 27.9                | -82.1                   | 94406                              | 8.16       |
| SW207    | 2/12/2019         | 2.69       | 34.3                | -364                    | 76950                              | 7.52       |
| SW207    | 27/05/2020        | 7.74       | 26.1                | 138.2                   | 67366                              | 8.21       |
| SW207    | 20/11/2020        | 3.42       | 32.3                | 155.2                   | 58687                              | 8.2        |
| SW207    | 4/03/2021         | 3.75       | 320                 | 84.1                    | 54484                              | 7.99       |
| SW207    | 24/06/2021        | 5.27       | 22.2                | 111.5                   | 62965                              | 7.97       |
| SW207    | 24/11/2021        | 3.96       | 28.8                | 15.4                    | 62828                              | 7.79       |
| SW207    | 18/05/2022        | 4.42       | 22.8                | 115.6                   | 55291                              | 8.12       |
| SW207    | 23/06/2022        | 3.05       | 22.5                | 43                      | 54623                              | 7.64       |
| SW207    | 23/11/2022        | 4.16       | 30                  | 104.2                   | 69745                              | 7.94       |
| SW207    | 28/06/2023        | 4.84       | 17.7                | 123.2                   | 47946                              | 7.91       |
| SW207    | 8/11/2023         | 3.58       | 29.5                | -69.7                   | 61714                              | 7.72       |
| SW207    | 8/11/2023         | 3.58       | 29.5                | -69.7                   | 61714                              | 7.72       |
| SW208    | 1/12/2019         | 4.54       | 26.8                | -421.1                  | 58856                              | 7.9        |
| SW208    | 26/05/2020        | 5.27       | 19.5                | 101.5                   | 50541                              | 8.36       |
| SW208    | 19/11/2020        | 3.92       | 29.4                | -25.8                   | 65205                              | 8.21       |
| SW208    | 4/03/2021         | 3.07       | 29.7                | 833                     | 54507                              | 80         |
| SW208    | 24/06/2021        | 5.32       | 15.1                | 131.9                   | 57188                              | 7.86       |
| SW208    | 25/11/2021        | 3.15       | 25.1                | 126.9                   | 57644                              | 7.91       |
| SW208    | 17/05/2022        | 4.08       | 21.8                | 146.9                   | 55049                              |            |
| SW208    | 23/06/2022        | 4.27       | 19.9                | 52.5                    | 54508                              | 8          |
| SW208    | 23/11/2022        | 3.22       | 24.1                | -87.1                   | 57843                              | 8.02       |
| SW208    | 28/06/2023        | 6.11       | 15.7                | 155.2                   | 43088                              | 8.04       |
| SW208    | 8/11/2023         | 3.59       | 24.4                | 124.1                   | 57019                              | 8.17       |

|          |                   | DO (Field) | Temperature (Field) | Redox Potential (Field) | Electrical Conductivity<br>(field) | pH (Field) |
|----------|-------------------|------------|---------------------|-------------------------|------------------------------------|------------|
| Location | Sampled Date/Time | mg/L       | °C                  | mV                      | µS/cm                              | pH Units   |
| SW208    | 8/11/2023         | 3.59       | 24.4                | 124.1                   | 57019                              | 8.17       |
| SW209    | 26/05/2020        | 4.23       | 21.4                | 135.5                   | 45233                              | 8.24       |
| SW209    | 20/11/2020        | 3.26       | 31.7                | 156                     | 63862                              | 8.24       |
| SW209    | 4/03/2021         | 4.1        | 34.7                | 75.9                    | 25507                              | 8.08       |
| SW209    | 24/06/2021        | 5.53       | 21.1                | 34.7                    | 29416                              | 7.89       |
| SW209    | 24/11/2021        | 4.55       | 31.2                | 37.2                    | 65972                              | 7.68       |
| SW209    | 18/05/2022        | 2.51       | 22                  | 121.1                   | 55102                              | 7.81       |
| SW209    | 22/06/2022        | 3.48       | 21.4                | -144.9                  | 36493                              | 7.79       |
| SW209    | 23/11/2022        | 2.47       | 28.1                | -58.8                   | 63970                              | 7.91       |
| SW209    | 28/06/2023        | 5.47       | 22.6                | 46.6                    | 62938                              | 7.89       |
| SW209    | 8/11/2023         | 2.73       | 32.4                | 125.5                   | 73906                              | 7.81       |
| SW209    | 8/11/2023         | 2.73       | 32.4                | 125.5                   | 73906                              | 7.81       |
| SW210    | 26/05/2020        | 6.03       | 20.3                | 124.7                   | 25493                              | 8.44       |
| SW210    | 20/11/2020        | 3.37       | 29.1                | 180.1                   | 69889                              | 7.99       |
| SW210    | 4/03/2021         | 3.17       | 31.9                | 111.5                   | 32976                              | 7.71       |
| SW210    | 24/06/2021        | 6.5        | 21.2                | 32.5                    | 62295                              | 8.1        |
| SW210    | 18/05/2022        | 3.83       | 22.3                | 117.8                   | 54509                              | 7.88       |
| SW210    | 22/06/2022        | 4.17       | 24.8                | -124.5                  | 46457                              | 7.65       |
| SW210    | 23/11/2022        | 3.21       | 30.7                | 7.99                    | 68444                              | 7.99       |
| SW210    | 28/06/2023        | 3.87       | 15.9                | 42.3                    | 68949                              | 7.96       |
| SW211    | 2/12/2019         | 4.64       | 35.3                | 48.7                    | 108763                             | 8.2        |
| SW211    | 26/05/2020        | 6.43       | 22.8                | 113.9                   | 27388                              | 8.74       |
| SW211    | 20/11/2020        | 4.08       | 31.4                | 156.6                   | 91215                              | 8.39       |
| SW211    | 4/03/2021         | 264        | 350                 | 1064                    | 32426                              | 807        |
| SW211    | 23/06/2021        | 6.81       | 22                  | 76                      | 27328                              | 8.29       |
| SW211    | 24/11/2021        | 4.13       | 32                  | 3.1                     | 94791                              | 7.88       |
| SW211    | 18/05/2022        | 4.73       | 21.1                | 108.7                   | 53854                              | 8.02       |
| SW211    | 23/06/2022        | 4.99       | 16.4                | 83.6                    | 35813                              | 7.97       |
| SW211    | 23/11/2022        | 1.96       | 31.5                | -47                     | 49375                              | 7.7        |
| SW211    | 28/06/2023        | 4.93       | 22.7                | 48.1                    | 84363                              | 8.03       |
| SW211    | 8/11/2023         | 5.05       | 33.4                | 100.7                   | 113360                             | 8.62       |
| SW211    | 8/11/2023         | 5.05       | 33.4                | 100.7                   | 113360                             | 8.62       |
| SW219    | 27/05/2020        | 10.56      | 21.6                | 100                     | 3505                               | 8.87       |
| SW219    | 4/03/2021         | 384        | 305                 | 808                     | 4214                               | 867        |
| SW219    | 17/05/2022        | 4.7        | 25.3                | 157.6                   | 367.5                              |            |
| SW227    | 22/06/2022        | 1.28       | 22.9                | 10                      | 1362                               | 8          |
| SW265    | 23/06/2021        | 7.35       | 17.3                | 87.8                    | 4580                               | 8.35       |
| SW265    | 17/05/2022        | 5.14       | 21.2                | 155                     | 6188                               |            |
| SW265    | 22/06/2022        | 7.44       | 25.1                | 34.1                    | 3528                               | 9.08       |
| SW288    | 4/03/2021         | 137        | 329                 | 797                     | 2708                               | 825        |
| SW288    | 18/05/2022        | 4.04       | 20.2                | 97.8                    | 52884                              | 8.11       |
| SW288    | 23/06/2022        | 6.18       | 25.4                | 41                      | 1753                               | 8.82       |
| SW298    | 24/06/2021        | 7.9        | 20.3                | 89.2                    | 5372                               | 8.47       |
| SW298    | 17/05/2022        | 4.1        | 25.4                | 180.6                   | 60054                              |            |
| SW298    | 23/06/2022        | 4.65       | 19.2                | 44                      | 1147                               | 8.49       |
| SW300    | 2/12/2019         | 4.61       | 35.8                | -423.7                  | 118794                             | 8.3        |
| SW300    | 26/05/2020        | 8.55       | 18.5                | 109.9                   | 20975                              | 8.7        |
| SW300    | 20/11/2020        | 4.74       | 37.4                | 35.1                    | 124945                             | 8.67       |
| SW300    | 4/03/2021         | 4.21       | 32.3                | 87                      | 30632                              | 8.48       |
| SW300    | 23/06/2021        | 7.19       | 19                  | 80.5                    | 27647                              | 8.26       |
| SW300    | 24/11/2021        | 3.97       | 30.8                | 101.1                   | 95529                              | 7.86       |
| SW300    | 18/05/2022        | 8.81       | 22                  | 99.3                    | 56593                              | 8.2        |
| SW300    | 23/06/2022        | 5.93       | 16.1                | 82                      | 35690                              | 8.13       |
| SW300    | 23/11/2022        | 2.22       | 32.2                | -28.2                   | 55265                              | 7.64       |
| SW300    | 28/06/2023        | 3.13       | 21                  | 40.5                    | 85075                              | 7.86       |
| SW300    | 8/11/2023         | 0          | 35.1                | 103.5                   | 113756                             | 8.97       |
| SW300    | 8/11/2023         | 0          | 35.1                | 103.5                   | 113756                             | 8.97       |
| SW301    | 25/05/2020        | 11.69      | 19.1                | 101.6                   | 18507                              | 8.39       |
| SW301    | 24/06/2021        | 4.92       | 18.6                | 115.3                   | 67552                              | 7.78       |
| SW301    | 25/11/2021        | 3.61       | 30                  | 139                     | 89283                              | 8.12       |
| SW301    | 17/05/2022        | 4.48       | 24.5                | 60.3                    | 59151                              | 7.78       |

|          |                   | DO (Field) | Temperature (Field) | Redox Potential (Field) | Electrical Conductivity<br>(field) | pH (Field) |
|----------|-------------------|------------|---------------------|-------------------------|------------------------------------|------------|
| Location | Sampled Date/Time | mg/L       | °C                  | mV                      | µS/cm                              | pH Units   |
| SW301    | 23/06/2022        | 4.21       | 22.1                | 51.1                    | 90882                              | 8          |
| SW301    | 23/11/2022        | 4.41       | 30.9                | -92.2                   | 82627                              | 8.31       |
| SW302    | 2/12/2019         | 3.19       | 34.6                | 48.8                    | 83226                              | 7.77       |
| SW302    | 26/05/2020        | 3.81       | 19.9                | 127.3                   | 42402                              | 8.1        |
| SW302    | 20/11/2020        | 3.31       | 32.2                | 172.9                   | 65707                              | 8.16       |
| SW302    | 4/03/2021         | 3.42       | 35.2                | 71.9                    | 38984                              | 8.12       |
| SW302    | 24/06/2021        | 4.85       | 20.4                | 47.8                    | 52230                              | 7.92       |
| SW302    | 24/11/2021        | 5.56       | 34.1                | -18.3                   | 72640                              | 8.02       |
| SW302    | 18/05/2022        | 3.02       | 21.1                | 117.9                   | 55446                              | 7.83       |
| SW302    | 22/06/2022        | 4.96       | 23.7                | -115.5                  | 31687                              | 7.92       |
| SW302    | 23/11/2022        | 1.27       | 27                  | -68.2                   | 77626                              | 7.8        |
| SW302    | 28/06/2023        | 4.38       | 18.2                | 44.4                    | 64491                              | 7.87       |
| SW302    | 8/11/2023         | 3.4        | 32.4                | 96.3                    | 93370                              | 7.97       |
| SW302    | 8/11/2023         | 3.4        | 32.4                | 96.3                    | 93370                              | 7.97       |
| SW303    | 2/12/2019         | 3.55       | 30.8                | 37.6                    | 74509                              | 7.6        |
| SW303    | 26/05/2020        | 5.2        | 17.9                | 104.3                   | 36922                              | 8.15       |
| SW303    | 20/11/2020        | 3.9        | 28.8                | -5.7                    | 68473                              | 7.97       |
| SW303    | 4/03/2021         | 3.54       | 29.2                | 85.7                    | 54377                              | 8.02       |
| SW303    | 23/06/2021        | 5.46       | 17.1                | 25.1                    | 53079                              | 7.8        |
| SW303    | 24/11/2021        | 3.18       | 29.8                | 36.1                    | 68662                              | 7.74       |
| SW303    | 18/05/2022        | 2.14       | 21.4                | 66                      | 55447                              | 7.78       |
| SW303    | 23/06/2022        | 3.2        | 19                  | 37.3                    | 33928                              | 7.85       |
| SW303    | 23/11/2022        | 1.93       | 29.4                | 113.5                   | 59682                              | 8.61       |
| SW303    | 28/06/2023        | 4.63       | 16.7                | 33.1                    | 64147                              | 7.9        |
| SW303    | 8/11/2023         | 1.48       | 29                  | -33.2                   | 73772                              | 7.27       |
| SW303    | 8/11/2023         | 1.48       | 29                  | -33.2                   | 73772                              | 7.27       |
| SW304    | 26/05/2020        | 4.42       | 17.7                | 106.6                   | 47922                              | 8.14       |
| SW304    | 20/11/2020        | 4.25       | 32.6                | 10.8                    | 78579                              | 8.09       |
| SW304    | 4/03/2021         | 3.08       | 29.3                | 94.3                    | 54547                              | 7.99       |
| SW304    | 23/06/2021        | 5.34       | 16.7                | 15.9                    | 28204                              | 7.84       |
| SW304    | 24/11/2021        | 3.17       | 28.7                | 78.6                    | 67438                              | 7.39       |
| SW304    | 18/05/2022        | 3.4        | 22.2                | 60.9                    | 55303                              | 7.83       |
| SW304    | 23/06/2022        | 3.56       | 18.8                | 71.6                    | 36381                              | 7.66       |
| SW304    | 23/11/2022        | 1.6        | 29.4                | 105.9                   | 69632                              | 8.12       |
| SW304    | 28/06/2023        | 6.29       | 19.5                | 106.2                   | 58217                              | 7.9        |
| SW304    | 8/11/2023         | 4.19       | 32.4                | 136.8                   | 84167                              | 8.11       |
| SW304    | 8/11/2023         | 4.19       | 32.4                | 136.8                   | 84167                              | 8.11       |
| SW305    | 26/05/2020        | 3.98       | 19.1                | 103.9                   | 45017                              | 8.04       |
| SW305    | 20/11/2020        | 3.46       | 33.6                | 6.1                     | 84087                              | 8.27       |
| SW305    | 23/06/2021        | 5.25       | 19                  | 24.4                    | 58390                              | 7.93       |
| SW305    | 24/11/2021        | 3.51       | 28.8                | 67.4                    | 64886                              | 7.6        |
| SW305    | 18/05/2022        | 3.16       | 20.6                | 113.6                   | 54529                              | 7.83       |
| SW305    | 23/06/2022        | 7          | 22.9                | 67.5                    | 37163                              | 8.07       |
| SW305    | 23/11/2022        | 3.81       | 28.5                | -54.7                   | 59045                              | 7.98       |
| SW305    | 28/06/2023        | 3.57       | 18.5                | 103.6                   | 58046                              | 7.79       |
| SW305    | 8/11/2023         | 1.92       | 26.7                | 134.2                   | 70704                              | 7.67       |
| SW305    | 8/11/2023         | 1.92       | 26.7                | 134.2                   | 70704                              | 7.67       |

| Monitoring Site ID | Date       | Sample ID         | Depth of Sampling (m) | Sampling Method    | Sample Condition | Sample Description                                   | Other SS Site Comments  |
|--------------------|------------|-------------------|-----------------------|--------------------|------------------|------------------------------------------------------|-------------------------|
| SD199              | 25/11/2021 | 0960_SD199_211125 | 0.1                   | Direct_into_Bottle | Dry              | Red, Fine to Medium Grained, Sand, no odour          |                         |
| SD199              | 17/05/2022 | 0960_SD199_220517 | 0.1                   | Trowel             | Dry              | reddy brown clay                                     |                         |
| SD199              | 22/06/2022 | 0960_SD199_220622 | 0.1                   | Shovel, Trowel     | Wet              | Red, CLAY, wet                                       | Recent rain             |
| SD200              | 25/11/2021 | 0960_SD200_211125 | 0.1                   | Direct_into_Bottle | Dry              | Red, Fine to Medium Grained, Sand, no odour          |                         |
| SD200              | 17/05/2022 | 0960_SD200_220517 | 0.1                   | Trowel             | Dry              | reddy brown sandy clay                               | QC107, 207              |
| SD200              | 22/06/2022 | 0960_SD200_220622 | 0.1                   | Shovel, Trowel     | Wet              | Red CLAY, wet                                        | Recent rain, creek full |
| SD205              | 25/11/2021 | 0960_SD205_211125 | 0.1                   | Shovel_Trowel      | Wet              | Brown, wet, clay                                     |                         |
| SD205              | 17/05/2022 | 0960_SD205_220517 | 0.1                   | Trowel             | Wet              | reddy brown sandy clay                               |                         |
| SD205              | 23/06/2022 | 0960_SD205_220623 | 0.1                   | Shovel, Trowel     | Wet              | Brown sand                                           |                         |
| SD207              | 24/11/2021 | 0960_SD207_211124 | 0.1                   | Direct_into_Bottle | Wet              | Brown, no odour, low plasticity                      |                         |
| SD207              | 18/05/2022 | 0960_SD207_220518 | 0.1                   | Trowel             | Wet              | Sandy clay. dk brown                                 |                         |
| SD207              | 23/06/2022 | 0960_SD207_220623 | 0.1                   | Shovel, Trowel     | Wet              | Brown clayey sand                                    |                         |
| SD208              | 25/11/2021 | 0960_SD208_211125 | 0.1                   | Shovel_Trowel      | Wet              | Beige sand, Fine to Coarse Grained, coarse w/ shells |                         |
| SD208              | 17/05/2022 | 0960_SD208_220517 | 0.1                   | Trowel             | Wet              | white yellow sand                                    |                         |
| SD208              | 23/06/2022 | 0960_SD208_220623 | 0.1                   | Shovel, Trowel     | Wet              | Grey coarse sand                                     | QC127/227               |
| SD209              | 24/11/2021 | 0960_SD209_211124 | 0.1                   | Direct_into_Bottle | Wet              | Brown, no odour                                      |                         |
| SD209              | 18/05/2022 | 0960_SD209_220518 | 0.1                   | Trowel             | Wet              | Brown sandy clay                                     |                         |
| SD209              | 22/06/2022 | 0960_SD209_220622 | 0.1                   | Shovel, Trowel     | Wet              | Brown, muddy, no odour                               |                         |
| SD210              | 24/11/2021 | 0960_SD210_211124 | 0.1                   | Direct_into_Bottle | Wet              | Moist under dry crust. No odour, red, sand           |                         |
| SD210              | 18/05/2022 | 0960_SD210_220518 | 0.1                   | Trowel             | Wet              | Sandy clay                                           |                         |
| SD210              | 22/06/2022 | 0960_SD210_220622 | 0.1                   | Shovel, Trowel     | Wet              | Brown, muddy, no odour                               |                         |
| SD211              | 24/11/2021 | 0960_SD211_211124 | 0.1                   | Shovel_Trowel      | Wet              | Brown, clay, hard                                    |                         |
| SD211              | 18/05/2022 | 0960_SD211_220518 | 0.1                   | Trowel             | Wet              | Brown clay                                           |                         |
| SD211              | 23/06/2022 | 0960_SD211_220623 | 0.1                   | Shovel, Trowel     | Wet              | Brown/grey CLAY, wet                                 |                         |
| SD219              | 25/11/2021 | 0960_SD219_211125 | 0.1                   | Direct_into_Bottle | Dry              | Red, fine to medium grained, sand, no odour          |                         |
| SD219              | 17/05/2022 | 0960_SD219_220517 | 0.1                   | Trowel             | Wet              | reddy brown clay                                     |                         |
| SD219              | 22/06/2022 | 0960_SD219_220622 | 0.1                   | Shovel, Trowel     | Dry              | Moist brown clay                                     |                         |
| SD300              | 24/11/2021 | 0960_SD300_211124 | 0.1                   | Shovel_Trowel      | Wet              | Brown, clay, wet, hard                               |                         |
| SD300              | 18/05/2022 | 0960_SD300_220518 | 0.1                   | Trowel             | Wet              | Brown clay                                           |                         |
| SD300              | 23/06/2022 | 0960_SD300_220623 | 0.1                   | Shovel, Trowel     | Wet              | Brown/grey CLAY, wet                                 |                         |
| SD301              | 24/11/2021 | 0960_SD301_211124 | 0.1                   | Shovel_Trowel      | Wet              | Brown, clay, medium plasticity                       |                         |
| SD301              | 18/05/2022 | 0960_SD301_220518 | 0.1                   | Trowel             | Wet              | Brown clay                                           |                         |
| SD301              | 23/06/2022 | 0960_SD301_220623 | 0.1                   | Shovel, Trowel     | Wet              | Grey/brown CLAY, wet                                 |                         |
| SD302              | 24/11/2021 | 0960_SD302_211124 | 0.1                   | Direct_into_Bottle | Wet              | Brown, no odour, clay, medium plasticity             |                         |
| SD302              | 18/05/2022 | 0960_SD302_220518 | 0.1                   | Trowel             | Wet              | Dk brown sandy clay                                  |                         |
| SD302              | 22/06/2022 | 0960_SD302_220622 | 0.1                   | Shovel, Trowel     | Wet              | Brown, muddy, no odour                               |                         |
| SD303              | 18/05/2022 | 0960_SD303_220518 | 0.1                   | Trowel             | Wet              | Dk brown clayey sand                                 |                         |
| SD303              | 23/06/2022 | 0960_SD303_220623 | 0.15                  | Shovel, Trowel     | Wet              | Brown/grey clayey SAND, wet                          |                         |
| SD304              | 24/11/2021 | 0960_SD304_211124 | 0.1                   | Shovel_Trowel      | Wet              | Brown, clay, medium platicity                        |                         |
| SD304              | 18/05/2022 | 0960_SD304_220518 | 0.1                   | Trowel             | Wet              | Brown coarse sand                                    |                         |
| SD304              | 23/06/2022 | 0960_SD304_220623 | 0.1                   | Shovel, Trowel     | Wet              | Brown/grey SAND, fine to medium, wet                 |                         |
| SD305              | 24/11/2021 | 0960_SD305_211124 | 0.1                   | Shovel_Trowel      | Wet              | Brown sandy clay                                     |                         |
| SD305              | 18/05/2022 | 0960_SD305_220518 | 0.1                   | Trowel             | Wet              | Brown coarse sand                                    |                         |
| SD305              | 23/06/2022 | 0960_SD305_220623 | 0.1                   | Shovel, Trowel     | Wet              | Brown SAND, fine to med grained, wet                 |                         |
| SS108              | 25/11/2021 | 0960_SS108_211125 | 0.1                   | Direct_into_Bottle | Dry              | Red, fine grained, sand, no odour                    |                         |
| SS108              | 17/05/2022 | 0960_SS108_220517 | 0.1                   | Trowel             | Dry              | reddy brown clay                                     |                         |
| SS108              | 22/06/2022 | 0960_SS108_220622 | 0.1                   | Shovel, Trowel     | Wet              | Soft brown clay                                      | SW taken                |
| SS113              | 25/11/2021 | 0960_SS113_211125 | 0.1                   | Direct_into_Bottle | Dry              | Red, fine grained, sand, no odour                    |                         |



|       |            |                   |      |                    |     |                                                                |              |
|-------|------------|-------------------|------|--------------------|-----|----------------------------------------------------------------|--------------|
| SS113 | 17/05/2022 | 0960_SS113_220517 | 0.1  | Trowel             | Dry | Orange clay with some gravels                                  |              |
| SS113 | 22/06/2022 | 0960_SS113_220622 | 0.1  | Shovel, Trowel     | Dry | Brown clay                                                     |              |
| SS114 | 24/11/2021 | 0960_SS114_211124 | 0.1  | Shovel_Trowel      | Dry | Brown, clay, medium plasticity                                 | QC117/217    |
| SS114 | 17/05/2022 | 0960_SS114_220517 | 0.1  | Trowel             | Dry | reddy brown clay                                               |              |
| SS114 | 22/06/2022 | 0960_SS114_220622 | 0.1  | Shovel, Trowel     | Dry | Moist brown gravelly clay                                      |              |
| SS121 | 24/11/2021 | 0960_SS121_211124 | 0.1  | Direct_into_Bottle | Dry | redy brown, sandy clay, fine particles                         |              |
| SS121 | 17/05/2022 | 0960_SS121_220517 | 0.1  | Trowel             | Dry | reddy brown clay                                               |              |
| SS121 | 22/06/2022 | 0960_SS121_220622 | 0.1  | Shovel, Trowel     | Dry | Brown/red, sandy, no odour                                     |              |
| SS122 | 24/11/2021 | 0960_SS122_211124 | 0.1  | Direct_into_Bottle | Dry | reddy brown, sandy clay, fine particles                        |              |
| SS122 | 17/05/2022 | 0960_SS122_220517 | 0.1  | Trowel             | Dry | reddy brown clay                                               | QC105, 205   |
| SS122 | 22/06/2022 | 0960_SS122_220622 | 0.1  | Shovel, Trowel     | Dry | Brown/red, sandy, no odour                                     |              |
| SS123 | 24/11/2021 | 0960_SS123_211124 | 0.1  | Direct_into_Bottle | Dry | teddy brown, sandy clay, fine particled                        | QC122/222    |
| SS123 | 17/05/2022 | 0960_SS123_220517 | 0.1  | Trowel             | Dry | Orange clay                                                    |              |
| SS123 | 22/06/2022 | 0960_SS123_220622 | 0.1  | Shovel, Trowel     | Dry | Red, sandy CLAY, med to fine grain, slightly moist             | QC118, QC218 |
| SS124 | 25/11/2021 | 0960_SS124_211125 | 0.1  | Direct_into_Bottle | Dry | redy brown, gravelly clay, fine to medium grained              |              |
| SS124 | 17/05/2022 | 0960_SS124_220517 | 0.1  | Trowel             | Dry | Orange clay                                                    |              |
| SS124 | 22/06/2022 | 0960_SS124_220622 | 0.1  | Shovel, Trowel     | Dry | Stiff brown clay                                               |              |
| SS125 | 25/11/2021 | 0960_SS125_211125 | 0.1  | Direct_into_Bottle | Dry | clayey gravel, redy brown, fine to medium grained              |              |
| SS125 | 17/05/2022 | 0960_SS125_220517 | 0.1  | Trowel             | Dry | Orange clay                                                    |              |
| SS125 | 22/06/2022 | 0960_SS125_220622 | 0.1  | Shovel, Trowel     | Dry | Stiff brown clay                                               |              |
| SS157 | 25/11/2021 | 0960_SS157_211125 | 0.1  | Direct_into_Bottle | Dry | redy brown, sandy clay, fine grained                           |              |
| SS157 | 17/05/2022 | 0960_SS157_220517 | 0.1  | Trowel             | Wet | reddy brown, gravelly clay                                     |              |
| SS157 | 22/06/2022 | 0960_SS157_220622 | 0.1  | Shovel, Trowel     | Wet | Brown clay                                                     |              |
| SS166 | 25/11/2021 | 0960_SS166_211125 | 0.1  | Direct_into_Bottle | Dry | redy brown, sandy clay, fine grained                           |              |
| SS166 | 17/05/2022 | 0960_SS166_220517 | 0.1  | Trowel             | Dry | Orange clay                                                    |              |
| SS166 | 22/06/2022 | 0960_SS166_220622 | 0.1  | Shovel, Trowel     | Wet | Stiff clay brown                                               |              |
| SS168 | 25/11/2021 | 0960_SS168_211125 | 0.1  | Direct_into_Bottle | Dry | redy brown, sandy clay, fine grained                           |              |
| SS168 | 17/05/2022 | 0960_SS168_220517 | 0.1  | Trowel             | Dry | Orange clay                                                    |              |
| SS168 | 22/06/2022 | 0960_SS168_220622 | 0.1  | Shovel, Trowel     | Dry | Stiff brown clay                                               |              |
| SS170 | 25/11/2021 | 0960_SS170_211125 | 0.1  | Direct_into_Bottle | Dry | Red, dry, fine to medium grained, sand                         |              |
| SS170 | 17/05/2022 | 0960_SS170_220517 | 0.1  | Trowel             | Wet | reddy brown, gravelly clay                                     |              |
| SS170 | 22/06/2022 | 0960_SS170_220622 | 0.1  | Shovel, Trowel     | Wet | Soft clay                                                      |              |
| SS174 | 25/11/2021 | 0960_SS174_211125 | 0.1  | Direct_into_Bottle | Dry | redy brown, sandy clay, fine grained                           |              |
| SS174 | 17/05/2022 | 0960_SS174_220517 | 0.1  | Trowel             | Dry | reddy brown, gravelly clay                                     |              |
| SS174 | 22/06/2022 | 0960_SS174_220622 | 0.1  | Shovel, Trowel     | Dry | Stiff brown clay                                               |              |
| SS176 | 25/11/2021 | 0960_SS176_211125 | 0.1  | Direct_into_Bottle | Dry | redy brown, gravelly sandy clay, fine to medium grained        |              |
| SS176 | 17/05/2022 | 0960_SS176_220517 | 0.1  | Trowel             | Dry | Orange clay                                                    |              |
| SS176 | 22/06/2022 | 0960_SS176_220622 | 0.1  | Shovel, Trowel     | Dry | Orange sandy clay. moist                                       |              |
| SS189 | 25/11/2021 | 0960_SS189_211125 | 0.1  | Direct_into_Bottle | Wet | dilty clay, moist, fine grained with small amounts of gravel   |              |
| SS189 | 17/05/2022 | 0960_SS189_220517 | 0.1  | Trowel             | Wet | reddy brown clay                                               |              |
| SS189 | 23/06/2022 | 0960_SS189_220623 | 0.1  | Shovel, Trowel     | Wet | Brown clay                                                     |              |
| SS190 | 24/11/2021 | 0960_SS190_211124 | 0.1  | Shovel_Trowel      | Dry | Brown, clay, hard, no odour                                    | QC119/219    |
| SS190 | 17/05/2022 | 0960_SS190_220517 | 0.1  | Trowel             | Wet | reddy brown clay                                               |              |
| SS190 | 23/06/2022 | 0960_SS190_220623 | 0.1  | Shovel, Trowel     | Wet | Red CLAY                                                       |              |
| SS192 | 24/11/2021 | 0960_SS192_211124 | 0.1  | Shovel_Trowel      | Dry | Beige, fine to medium grained, sub angular to subrounded, sand |              |
| SS192 | 18/05/2022 | 0960_SS192_220518 | 0.1  | Trowel             | Wet | Brown coarse sand                                              |              |
| SS192 | 23/06/2022 | 0960_SS192_220623 | 0.1  | Shovel, Trowel     | Wet | Red/brown SAND, fine to med grained                            |              |
| SS193 | 24/11/2021 | 0960_SS193_211124 | 0.1  | Shovel_Trowel      | Wet | Brown, clay, medium platicity, no odour                        |              |
| SS193 | 18/05/2022 | 0960_SS193_220518 | 0.1  | Trowel             | Wet | Coarse brown sand                                              | QC111/211    |
| SS193 | 23/06/2022 | 0960_SS193_220623 | 0.15 | Shovel, Trowel     | Wet | Red SAND, fine grained                                         |              |

|       |            |                   |     |                    |     |                                                                    |                          |
|-------|------------|-------------------|-----|--------------------|-----|--------------------------------------------------------------------|--------------------------|
| SS198 | 24/11/2021 | 0960_SS198_211124 | 0.1 | Direct_into_Bottle | Wet | Red, fined to med grained, sub ang. To sub rounded, sand, No odour | QC125/225 collected here |
| SS198 | 18/05/2022 | 0960_SS198_220518 | 0.1 | Trowel             | Dry | Brown sand                                                         | QC112/212                |
| SS198 | 22/06/2022 | 0960_SS198_220622 | 0.1 | Shovel, Trowel     | Dry | Red/brown clayey SAND, slightly moist                              |                          |
| SS227 | 24/11/2021 | 0960_SS227_211124 | 0.1 | Direct_into_Bottle | Dry | Red, fined to med grained, sand, No odour                          | QC121/221 collected here |
| SS227 | 17/05/2022 | 0960_SS227_220517 | 0.1 | Trowel             | Dry | Orange sandy clay                                                  |                          |
| SS227 | 22/06/2022 | 0960_SS227_220622 | 0.1 | Shovel, Trowel     | Wet | Red Clay, wet                                                      | QC123, QC223             |
| SS231 | 25/11/2021 | 0960_SS231_211125 | 0.1 | Direct_into_Bottle | Dry | Red, fined to med grained, sub ang. To sub rounded, sand, No odour |                          |
| SS231 | 17/05/2022 | 0960_SS231_220517 | 0.1 | Trowel             | Dry | reddy brown clay                                                   |                          |
| SS231 | 22/06/2022 | 0960_SS231_220622 | 0.1 | Shovel, Trowel     | Dry | Gravelly orange clay                                               |                          |
| SS234 | 24/11/2021 | 0960_SS234_211124 | 0.1 | Shovel_Trowel      | Dry | Brown, medium plasticity, clay, no odour                           |                          |
| SS234 | 17/05/2022 | 0960_SS234_220517 | 0.1 | Trowel             | Dry | reddy brown clay                                                   |                          |
| SS234 | 22/06/2022 | 0960_SS234_220622 | 0.1 | Shovel, Trowel     | Dry | Moist brown clay                                                   |                          |
| SS235 | 25/11/2021 | 0960_SS235_211125 | 0.1 | Direct_into_Bottle | Dry | Red, fine to med. Grained sand, no odour                           |                          |
| SS235 | 17/05/2022 | 0960_SS235_220517 | 0.1 | Trowel             | Dry | Orange clay                                                        |                          |
| SS235 | 22/06/2022 | 0960_SS235_220622 | 0.1 | Shovel, Trowel     | Wet | Brown clay                                                         |                          |
| SS243 | 25/11/2021 | 0960_SS243_211125 | 0.1 | Direct_into_Bottle | Dry | redy brown, sandy clay, fine grained                               |                          |
| SS243 | 17/05/2022 | 0960_SS243_220517 | 0.1 | Trowel             | Dry | reddy brown, gravelly clay                                         |                          |
| SS243 | 22/06/2022 | 0960_SS243_220622 | 0.1 | Shovel, Trowel     | Dry | Stiff brown clay                                                   |                          |
| SS265 | 25/11/2021 | 0960_SS265_211125 | 0.1 | Direct_into_Bottle | Dry | Red, fine to med. Grained sand, no odour                           |                          |
| SS265 | 17/05/2022 | 0960_SS265_220517 | 0.1 | Trowel             | Wet | reddy brown, gravelly clay                                         | QC106, 206               |
| SS265 | 22/06/2022 | 0960_SS265_220622 | 0.1 | Shovel, Trowel     | Wet | Soft brown sandy clay                                              |                          |
| SS277 | 25/11/2021 | 0960_SS277_211125 | 0.1 | Direct_into_Bottle | Dry | red to brown, gravelly clay, fine to medium grained                |                          |
| SS277 | 17/05/2022 | 0960_SS277_220517 | 0.1 | Trowel             | Dry | Orange clay                                                        |                          |
| SS277 | 22/06/2022 | 0960_SS277_220622 | 0.1 | Shovel, Trowel     | Dry | Fine brown clay                                                    |                          |
| SS278 | 25/11/2021 | 0960_SS278_211125 | 0.1 | Direct_into_Bottle | Dry | red to brown, clayey silty gravel fine to medium grained           |                          |
| SS278 | 17/05/2022 | 0960_SS278_220517 | 0.1 | Trowel             | Dry | reddy brown, clay                                                  |                          |
| SS278 | 22/06/2022 | 0960_SS278_220622 | 0.1 | Shovel, Trowel     | Dry | Brown clay                                                         | QC125/225                |
| SS279 | 25/11/2021 | 0960_SS279_211125 | 0.1 | Direct_into_Bottle | Dry | red to brown, sandy clay, fine grained                             |                          |
| SS279 | 17/05/2022 | 0960_SS279_220517 | 0.1 | Trowel             | Dry | Orange clay                                                        |                          |
| SS279 | 22/06/2022 | 0960_SS279_220622 | 0.1 | Shovel, Trowel     | Dry | Stiff brown clay                                                   |                          |
| SS288 | 24/11/2021 | 0960_SS288_211124 | 0.1 | Shovel_Trowel      | Dry | Beige, fine to med. Grained sand, sub-angular to sub-rounded, sand |                          |
| SS288 | 18/05/2022 | 0960_SS288_220518 | 0.1 | Trowel             | Wet | Brown fine sand                                                    |                          |
| SS288 | 23/06/2022 | 0960_SS288_220623 | 0.1 | Shovel, Trowel     | Wet | Brown sandy clay                                                   |                          |
| SS291 | 24/11/2021 | 0960_SS291_211124 | 0.1 | Direct_into_Bottle | Dry | Red, fine to medium grained, sand no odour                         |                          |
| SS291 | 17/05/2022 | 0960_SS291_220517 | 0.1 | Trowel             | Dry | reddy brown clay                                                   |                          |
| SS291 | 22/06/2022 | 0960_SS291_220622 | 0.1 | Shovel, Trowel     | Wet | Red/brown CLAY, moist                                              |                          |
| SS292 | 24/11/2021 | 0960_SS292_211124 | 0.1 | Direct_into_Bottle | Dry | Red, fine to medium grained sand, No odour                         |                          |
| SS292 | 18/05/2022 | 0960_SS292_220518 | 0.1 | Trowel             | Dry | reddy brown clay                                                   |                          |
| SS292 | 22/06/2022 | 0960_SS292_220622 | 0.1 | Shovel, Trowel     | Dry | Red clayey SAND, fine grained, slightly moist                      |                          |
| SS293 | 24/11/2021 | 0960_SS293_211124 | 0.1 | Direct_into_Bottle | Dry | Red, fine to medium grained, sand, no odour                        |                          |
| SS293 | 18/05/2022 | 0960_SS293_220518 | 0.1 | Trowel             | Dry | Brown sand                                                         |                          |
| SS293 | 22/06/2022 | 0960_SS293_220622 | 0.1 | Shovel, Trowel     | Dry | Brown clay, moist                                                  | QC122, QC222             |
| SS298 | 25/11/2021 | 0960_SS298_211125 | 0.1 | Shovel_Trowel      | Dry | Brown, low plasticity, clay, no odour                              |                          |
| SS298 | 17/05/2022 | 0960_SS298_220517 | 0.1 | Trowel             | Wet | reddy brown sandy clay                                             |                          |
| SS298 | 23/06/2022 | 0960_SS298_220623 | 0.1 | Shovel, Trowel     | Wet | Orange clay                                                        |                          |
| SS301 | 25/11/2021 | 0960_SS301_211125 | 0.1 | Shovel_Trowel      | Wet | Brown, low plasticity, clay, no odour.                             |                          |
| SS301 | 17/05/2022 | 0960_SS301_220517 | 0.1 | Trowel             | Wet | reddy brown, sandy clay                                            |                          |
| SS301 | 23/06/2022 | 0960_SS301_220623 | 0.1 | Shovel, Trowel     | Wet | Soft brown clay                                                    |                          |



# Trend Report

Report Date & Time: 2023-03-09 07:54:55

Data File Name: 0960\_inputPFOS2022.csv

Report Title: Groundwater PFOS Trend

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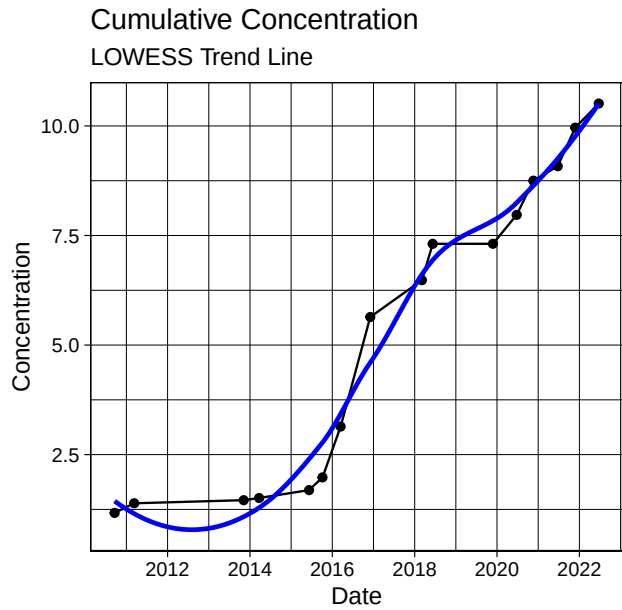
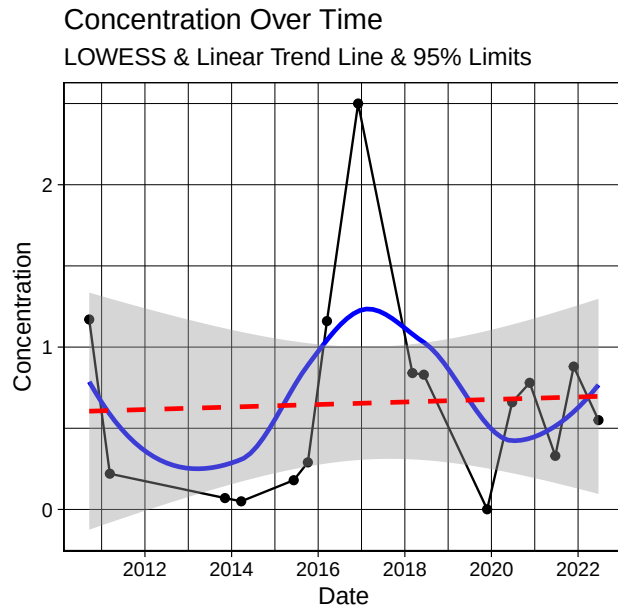
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| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 16             |
| z                                     | 0.41           |
| p                                     | 0.69           |
| S                                     | 10             |
| varS                                  | 493.33         |
| tau                                   | 0.08           |
| mean                                  | 0.66           |
| sd                                    | 0.62           |
| cov                                   | 0.95           |
| results                               | NO CLEAR TREND |

Report for ID : MW018 and Analyte : PFOS

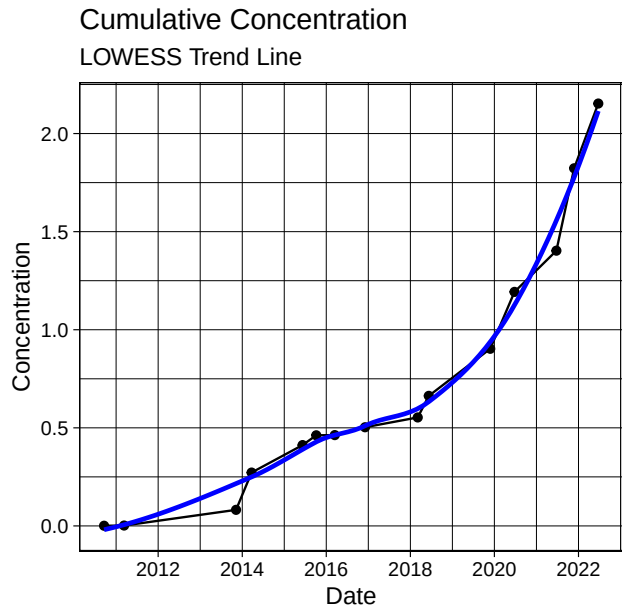
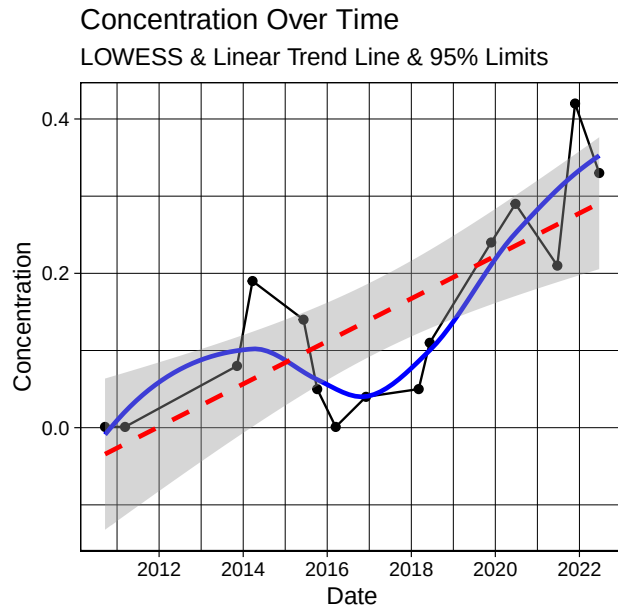


| Kendall Trend Test Results Continuous |            |
|---------------------------------------|------------|
| n                                     | 15         |
| z                                     | 2.99       |
| p                                     | 0          |
| S                                     | 61         |
| varS                                  | 403.67     |
| tau                                   | 0.59       |
| mean                                  | 0.14       |
| sd                                    | 0.13       |
| cov                                   | 0.92       |
| results                               | INCREASING |

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Report for ID : MW021 and Analyte : PFOS

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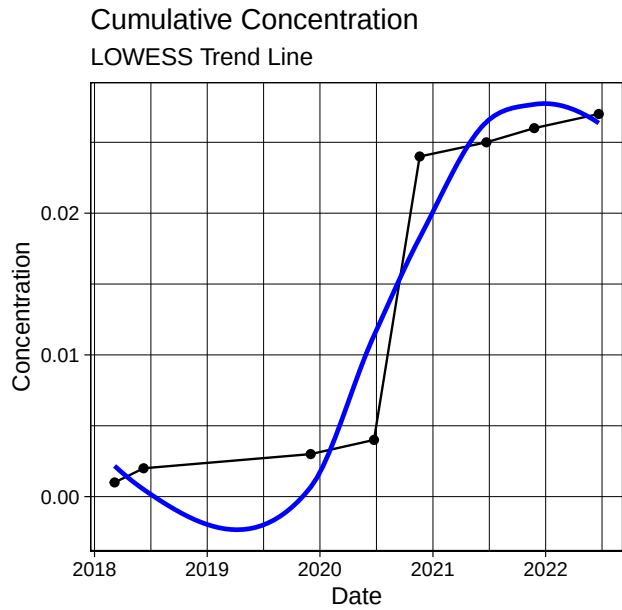
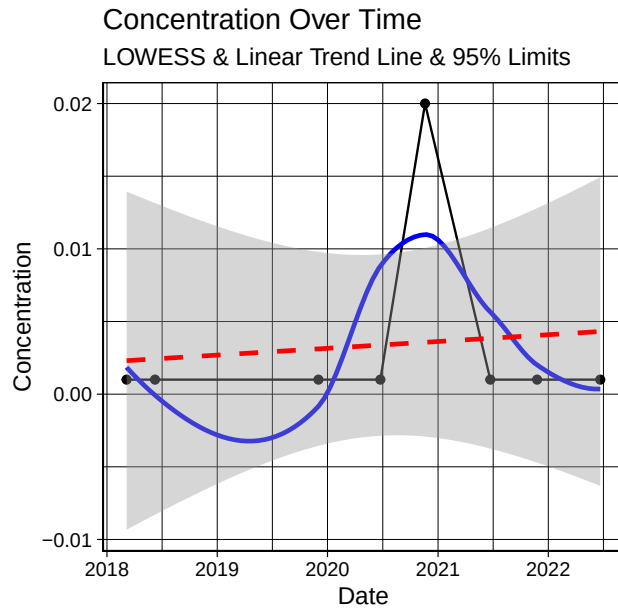


| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 8              |
| z                                     | 0              |
| p                                     | 1              |
| S                                     | 1              |
| varS                                  | 21             |
| tau                                   | 0.07           |
| mean                                  | 0              |
| sd                                    | 0.01           |
| cov                                   | 1.99           |
| results                               | NO CLEAR TREND |

---

Report for ID : MW102 and Analyte : PFOS

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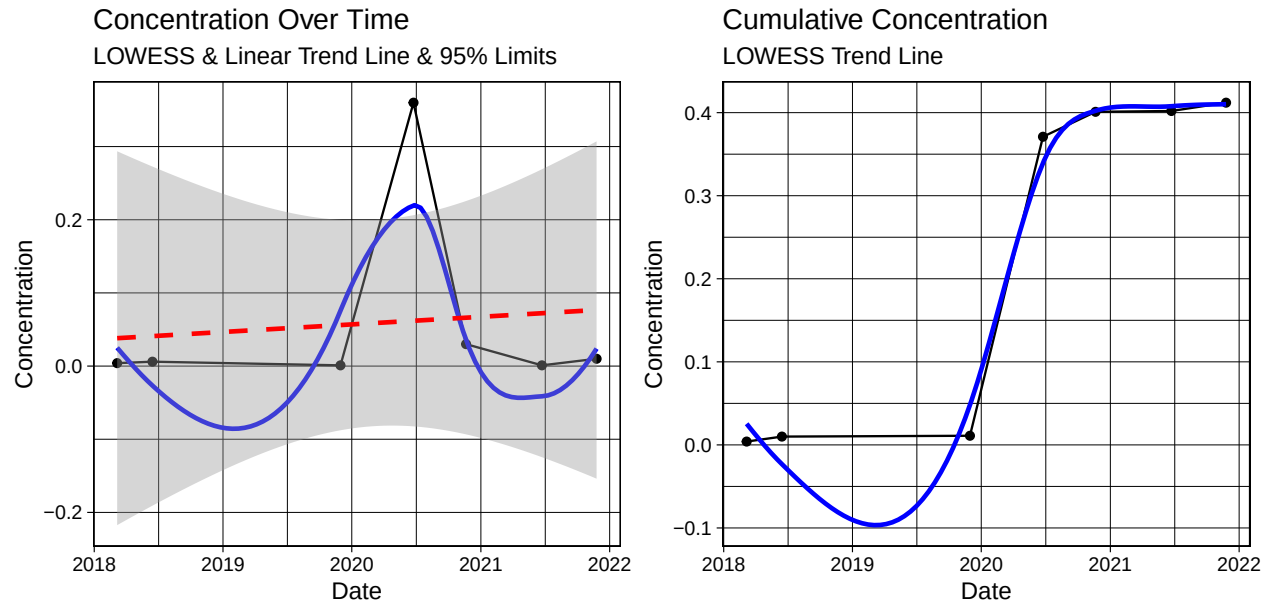


| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 7              |
| z                                     | 0.15           |
| p                                     | 0.88           |
| S                                     | 2              |
| varS                                  | 43.33          |
| tau                                   | 0.1            |
| mean                                  | 0.06           |
| sd                                    | 0.13           |
| cov                                   | 2.26           |
| results                               | NO CLEAR TREND |

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Report for ID : MW103 and Analyte : PFOS

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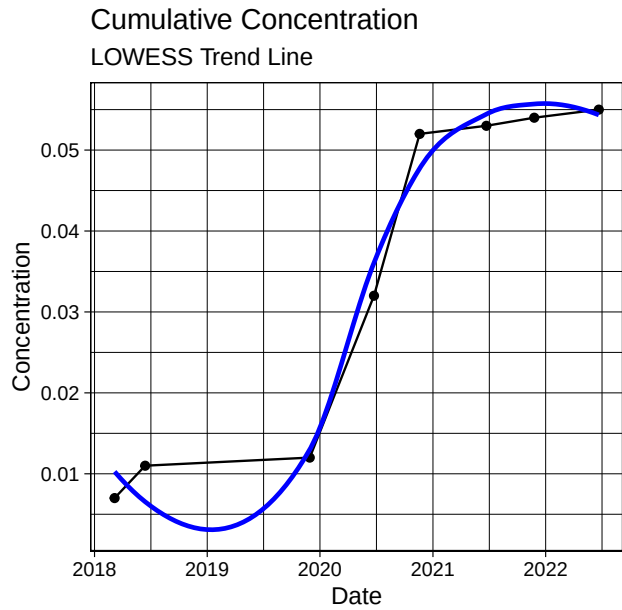
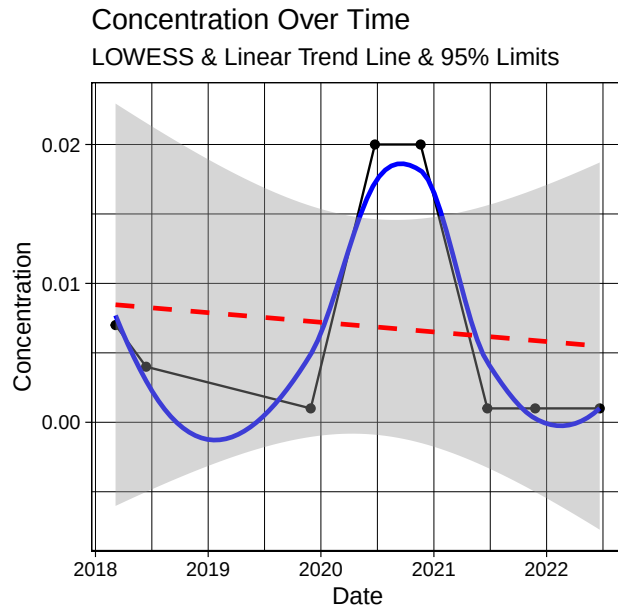


| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 8              |
| z                                     | -1.07          |
| p                                     | 0.28           |
| S                                     | -9             |
| varS                                  | 55.67          |
| tau                                   | -0.37          |
| mean                                  | 0.01           |
| sd                                    | 0.01           |
| cov                                   | 1.22           |
| results                               | NO CLEAR TREND |

---

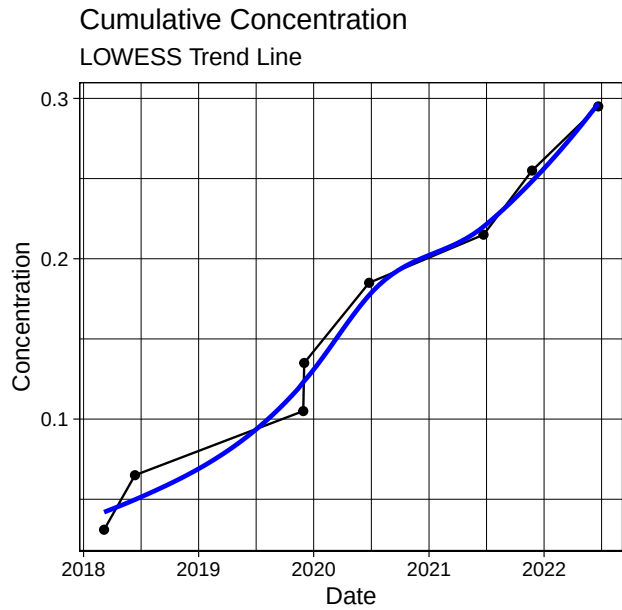
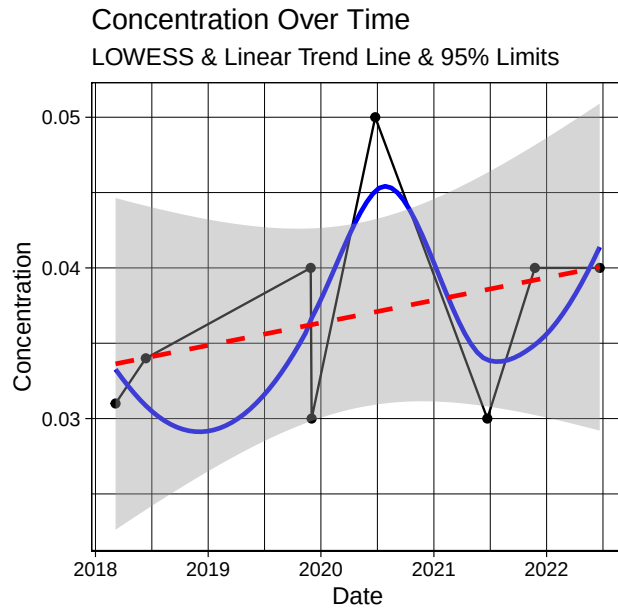
Report for ID : MW104 and Analyte : PFOS

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| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 8              |
| z                                     | 0.64           |
| p                                     | 0.52           |
| S                                     | 6              |
| varS                                  | 60.67          |
| tau                                   | 0.23           |
| mean                                  | 0.04           |
| sd                                    | 0.01           |
| cov                                   | 0.19           |
| results                               | NO CLEAR TREND |

Report for ID : MW105 and Analyte : PFOS



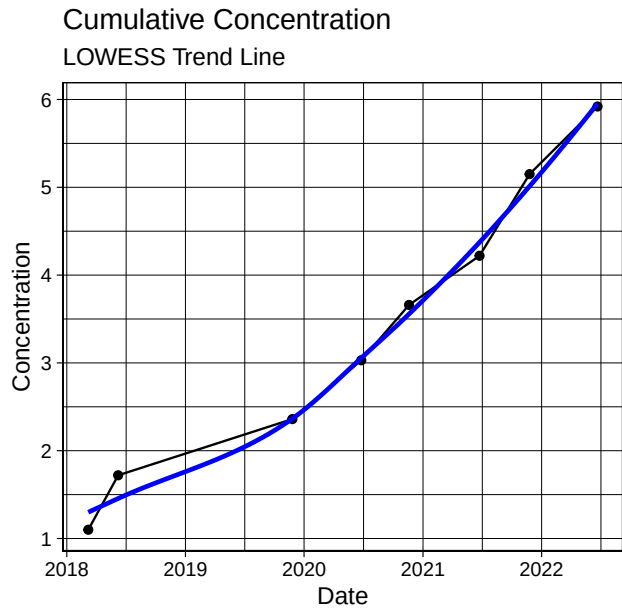
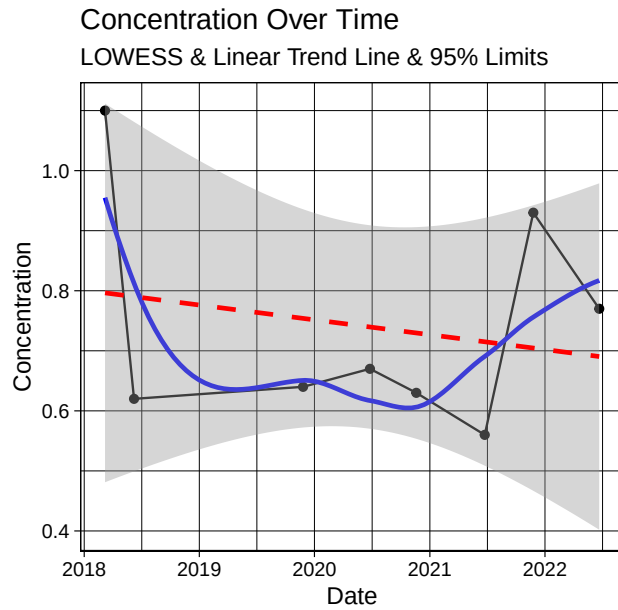


| Kendall Trend Test Results Continuous |        |
|---------------------------------------|--------|
| n                                     | 8      |
| z                                     | 0      |
| p                                     | 1      |
| S                                     | 0      |
| varS                                  | 65.33  |
| tau                                   | 0      |
| mean                                  | 0.74   |
| sd                                    | 0.19   |
| cov                                   | 0.25   |
| results                               | STABLE |

---

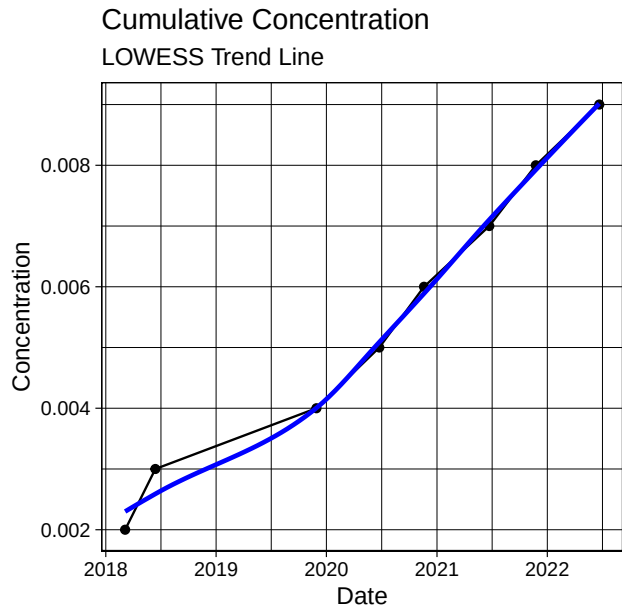
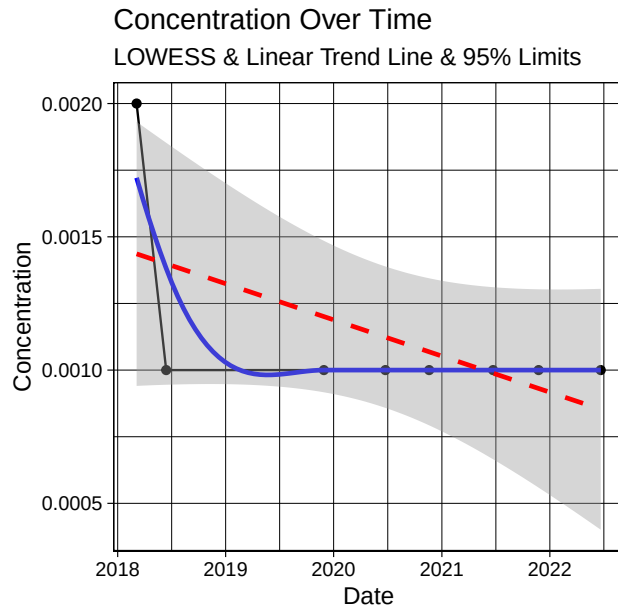
Report for ID : MW112 and Analyte : PFOS

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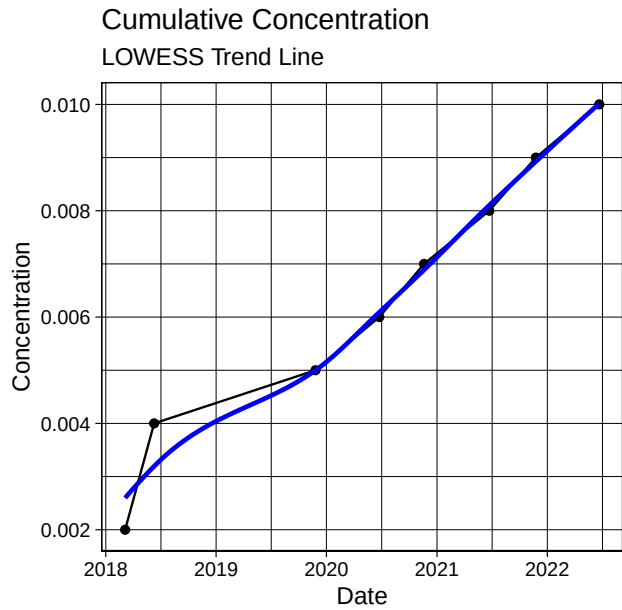
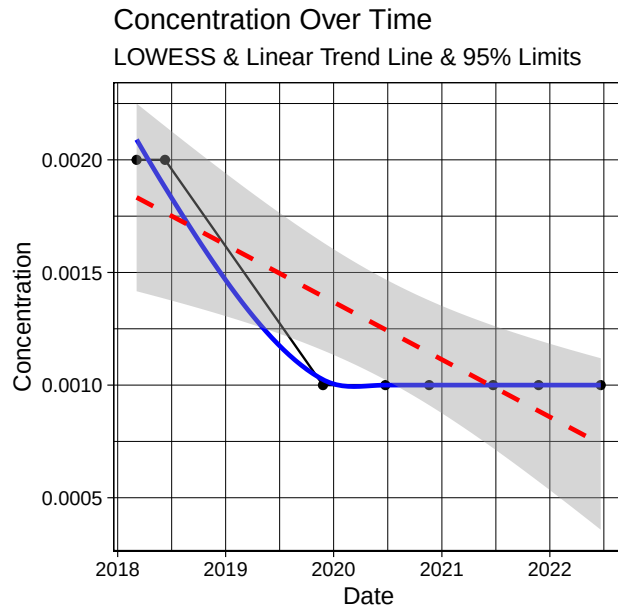
| Kendall Trend Test Results Continuous |        |
|---------------------------------------|--------|
| n                                     | 8      |
| z                                     | -1.31  |
| p                                     | 0.19   |
| S                                     | -7     |
| varS                                  | 21     |
| tau                                   | -0.5   |
| mean                                  | 0      |
| sd                                    | 0      |
| cov                                   | 0.31   |
| results                               | STABLE |

Report for ID : MW113 and Analyte : PFOS



| Kendall Trend Test Results Continuous |                     |
|---------------------------------------|---------------------|
| n                                     | 8                   |
| z                                     | -1.83               |
| p                                     | 0.07                |
| S                                     | -12                 |
| varS                                  | 36                  |
| tau                                   | -0.65               |
| mean                                  | 0                   |
| sd                                    | 0                   |
| cov                                   | 0.37                |
| results                               | POSSIBLY DECREASING |

Report for ID : MW114 and Analyte : PFOS

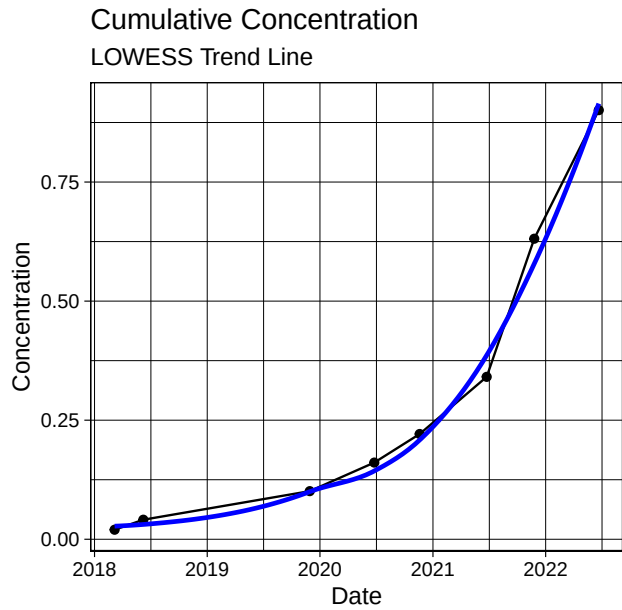
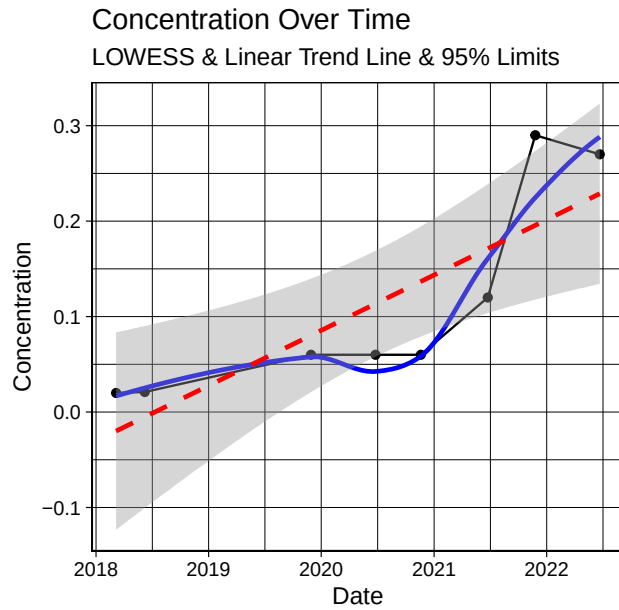


| Kendall Trend Test Results Continuous |            |
|---------------------------------------|------------|
| n                                     | 8          |
| z                                     | 2.8        |
| p                                     | 0.01       |
| S                                     | 23         |
| varS                                  | 61.67      |
| tau                                   | 0.87       |
| mean                                  | 0.11       |
| sd                                    | 0.11       |
| cov                                   | 0.96       |
| results                               | INCREASING |

---

Report for ID : MW115 and Analyte : PFOS

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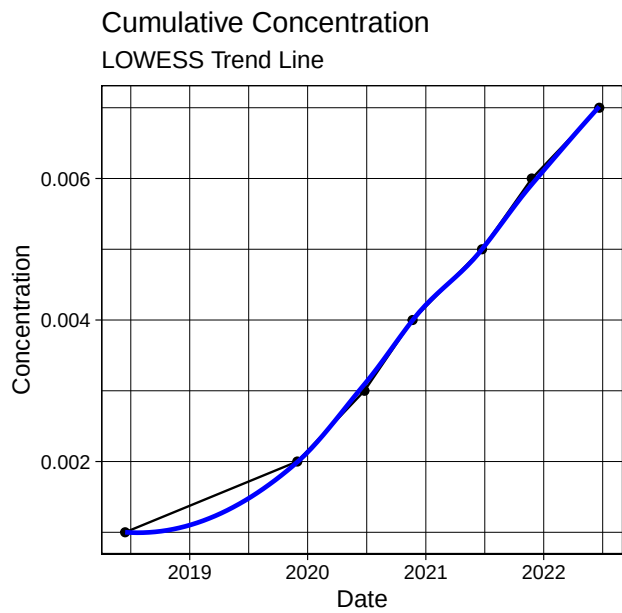
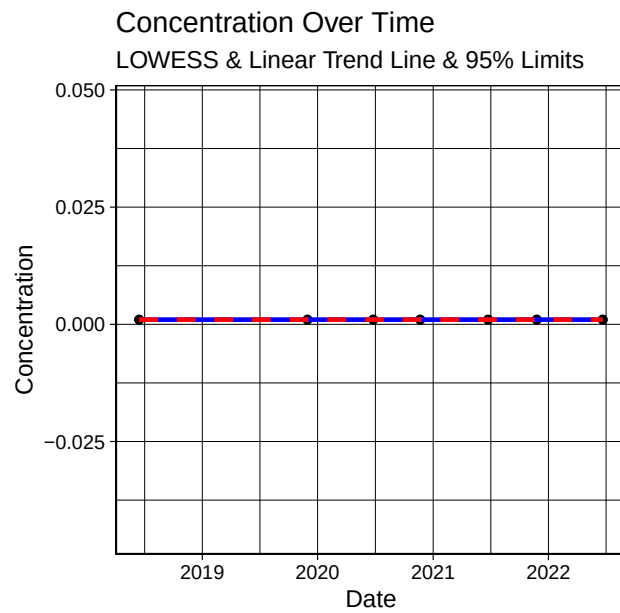


| Kendall Trend Test Results Continuous |     |
|---------------------------------------|-----|
| n                                     | 7   |
| z                                     | NaN |
| p                                     | NaN |
| S                                     | 0   |
| varS                                  | 0   |
| tau                                   | NaN |
| mean                                  | 0   |
| sd                                    | 0   |
| cov                                   | 0   |
| results                               | NA  |

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Report for ID : MW122 and Analyte : PFOS

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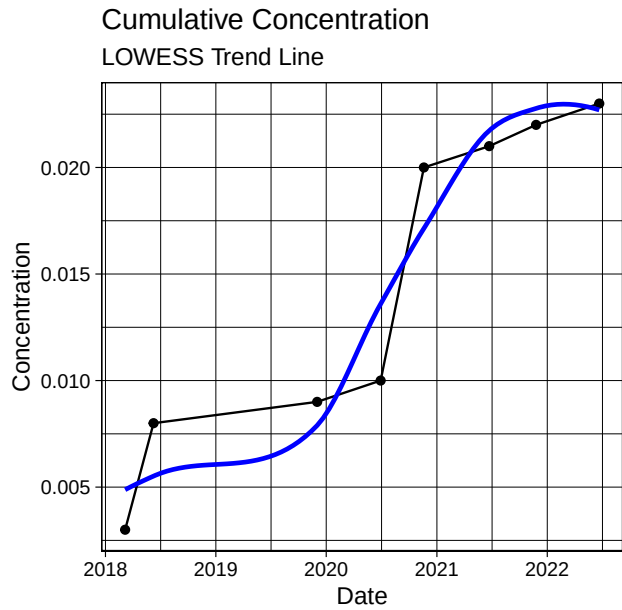
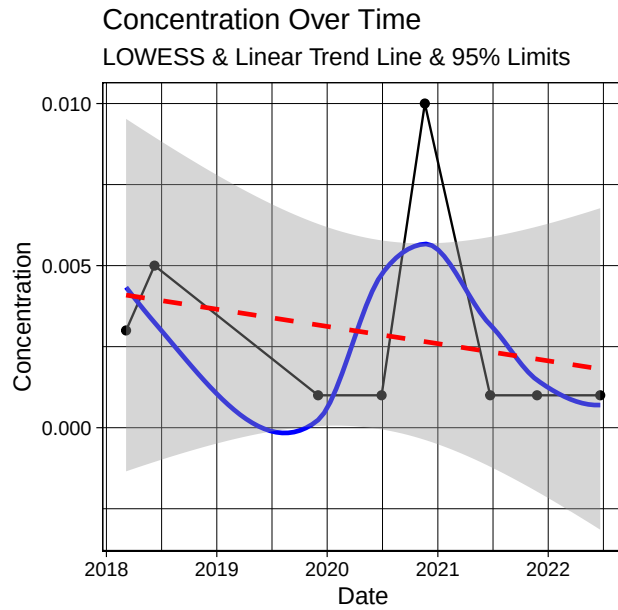


| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 8              |
| z                                     | -1             |
| p                                     | 0.32           |
| S                                     | -8             |
| varS                                  | 48.67          |
| tau                                   | -0.36          |
| mean                                  | 0              |
| sd                                    | 0              |
| cov                                   | 1.12           |
| results                               | NO CLEAR TREND |

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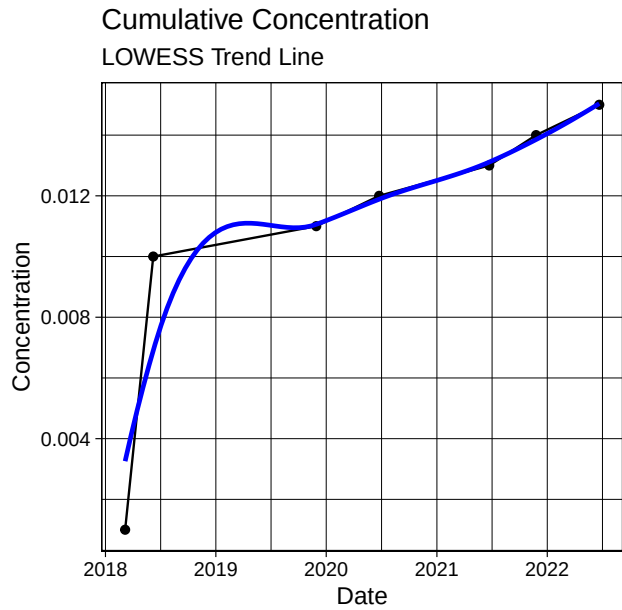
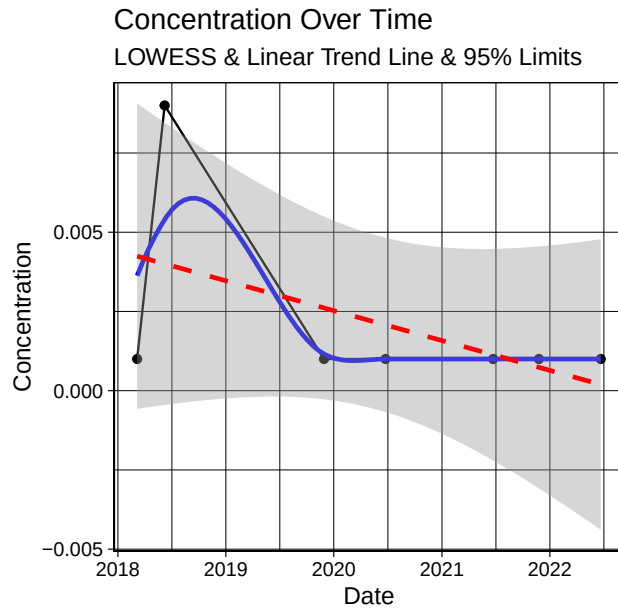
Report for ID : MW124 and Analyte : PFOS

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| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 7              |
| z                                     | -0.75          |
| p                                     | 0.45           |
| S                                     | -4             |
| varS                                  | 16             |
| tau                                   | -0.36          |
| mean                                  | 0              |
| sd                                    | 0              |
| cov                                   | 1.41           |
| results                               | NO CLEAR TREND |

Report for ID : MW126 and Analyte : PFOS



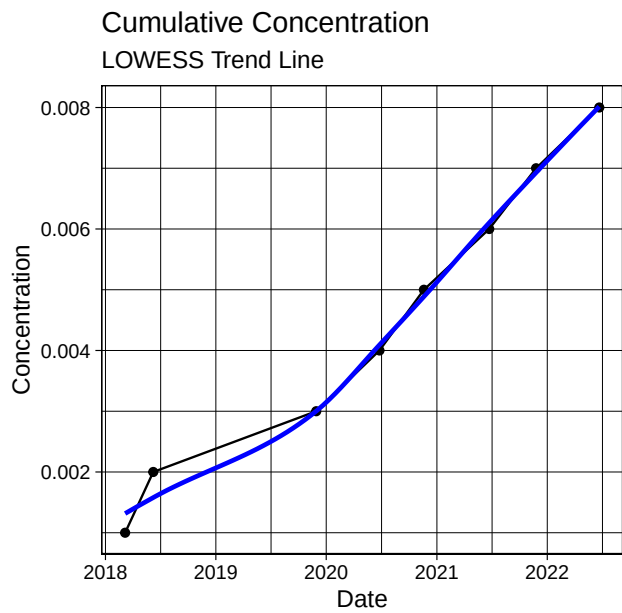
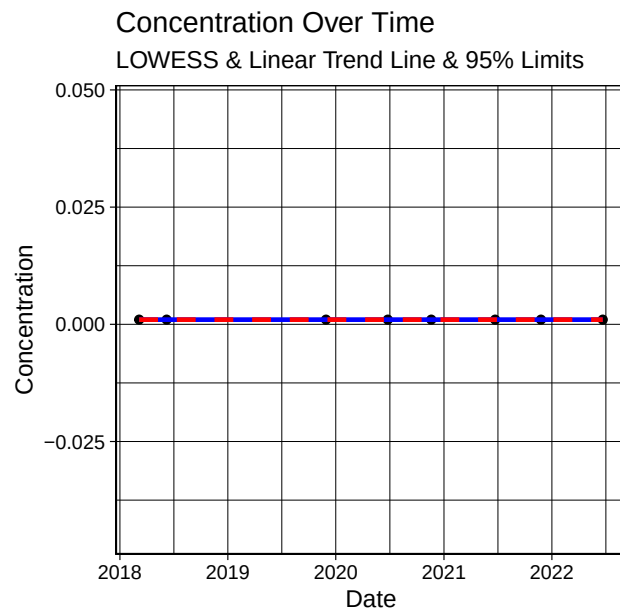


| Kendall Trend Test Results Continuous |     |
|---------------------------------------|-----|
| n                                     | 8   |
| z                                     | NaN |
| p                                     | NaN |
| S                                     | 0   |
| varS                                  | 0   |
| tau                                   | NaN |
| mean                                  | 0   |
| sd                                    | 0   |
| cov                                   | 0   |
| results                               | NA  |

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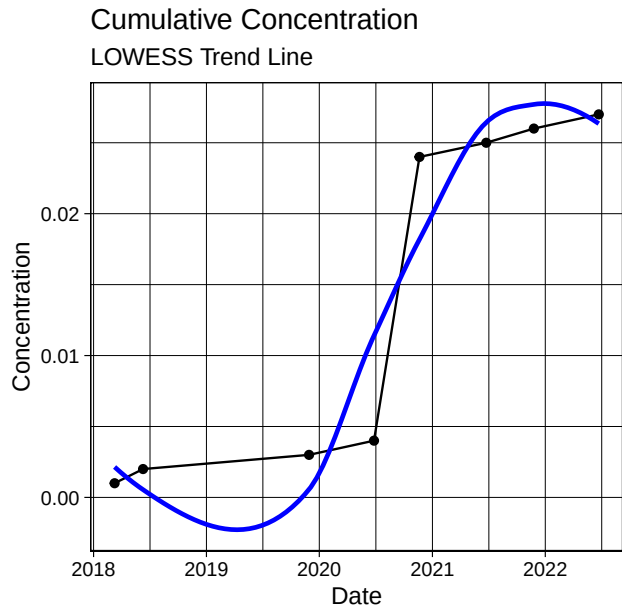
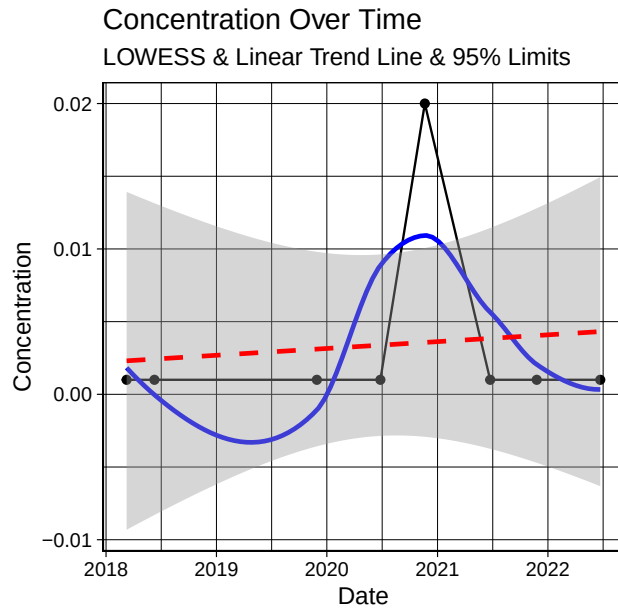
Report for ID : MW127 and Analyte : PFOS

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| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 8              |
| z                                     | 0              |
| p                                     | 1              |
| S                                     | 1              |
| varS                                  | 21             |
| tau                                   | 0.07           |
| mean                                  | 0              |
| sd                                    | 0.01           |
| cov                                   | 1.99           |
| results                               | NO CLEAR TREND |

Report for ID : MW134 and Analyte : PFOS

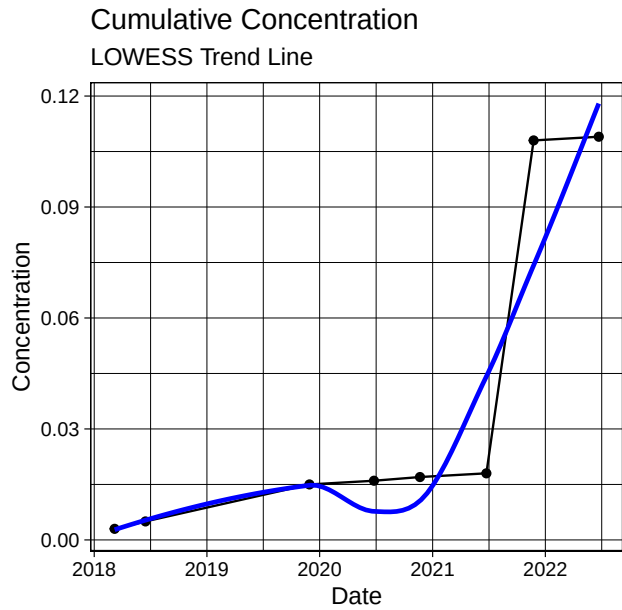
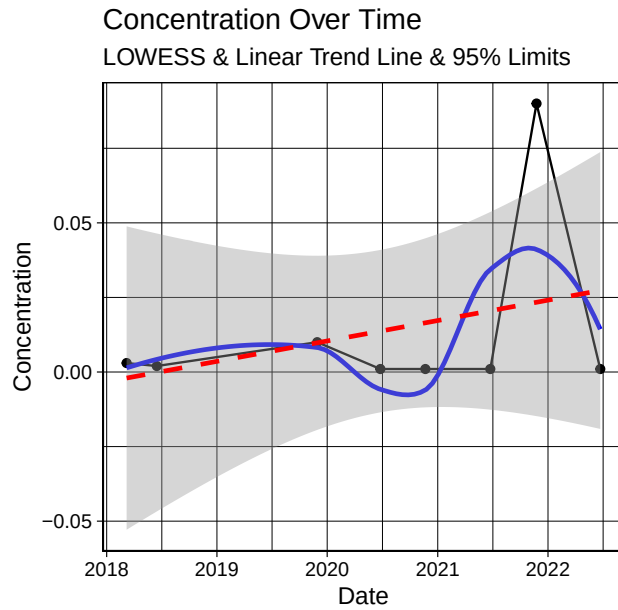


| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 8              |
| z                                     | -0.66          |
| p                                     | 0.51           |
| S                                     | -6             |
| varS                                  | 56.67          |
| tau                                   | -0.24          |
| mean                                  | 0.01           |
| sd                                    | 0.03           |
| cov                                   | 2.28           |
| results                               | NO CLEAR TREND |

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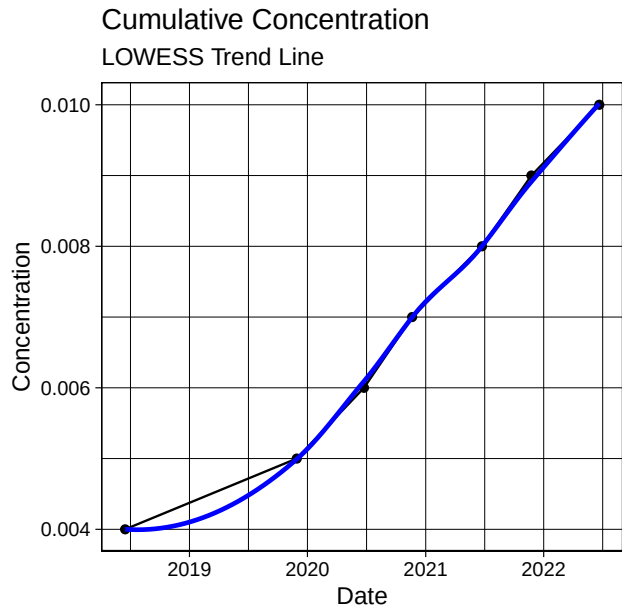
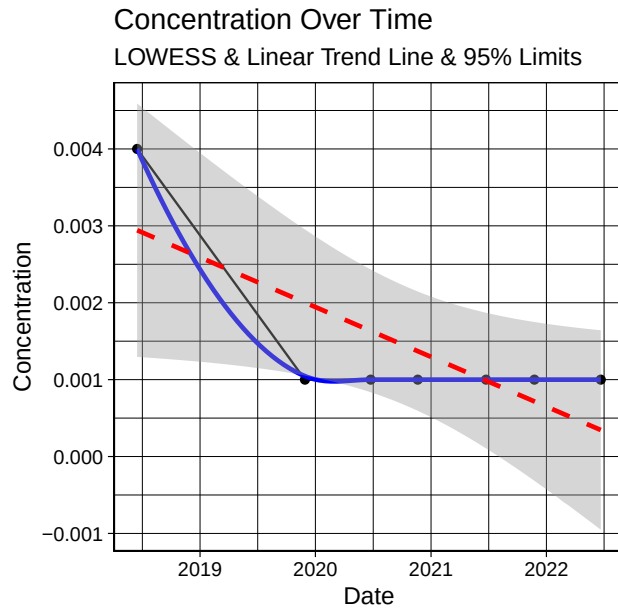
Report for ID : MW135 and Analyte : PFOS

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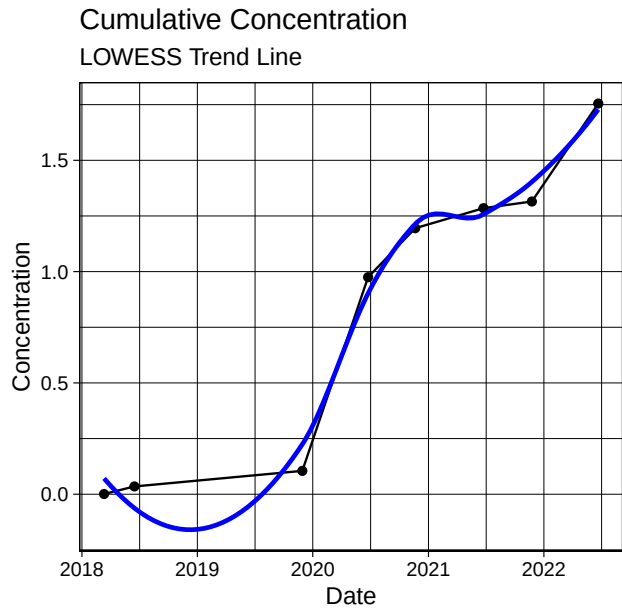
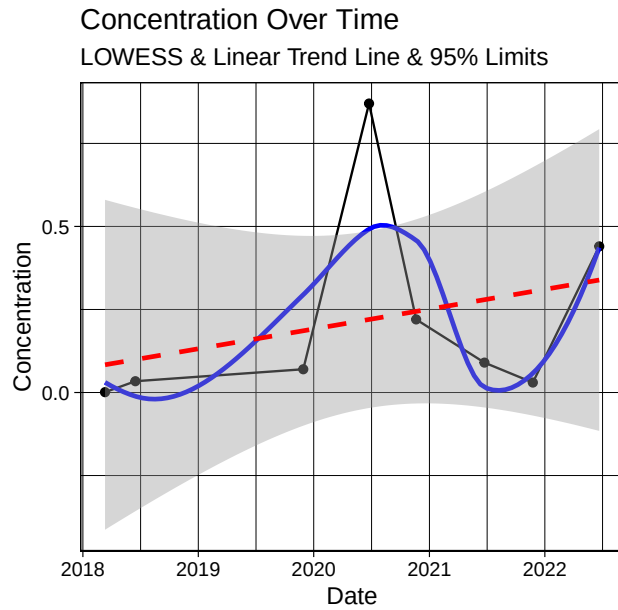
| Kendall Trend Test Results Continuous |        |
|---------------------------------------|--------|
| n                                     | 7      |
| z                                     | -1.25  |
| p                                     | 0.21   |
| S                                     | -6     |
| varS                                  | 16     |
| tau                                   | -0.53  |
| mean                                  | 0      |
| sd                                    | 0      |
| cov                                   | 0.79   |
| results                               | STABLE |

Report for ID : MW137 and Analyte : PFOS



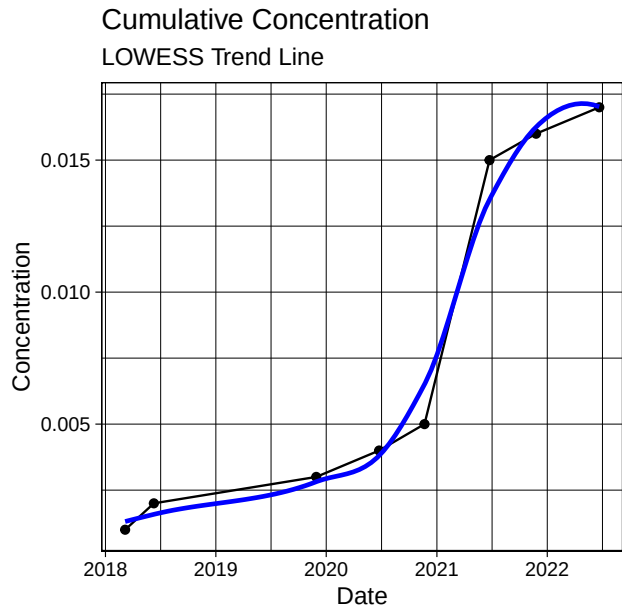
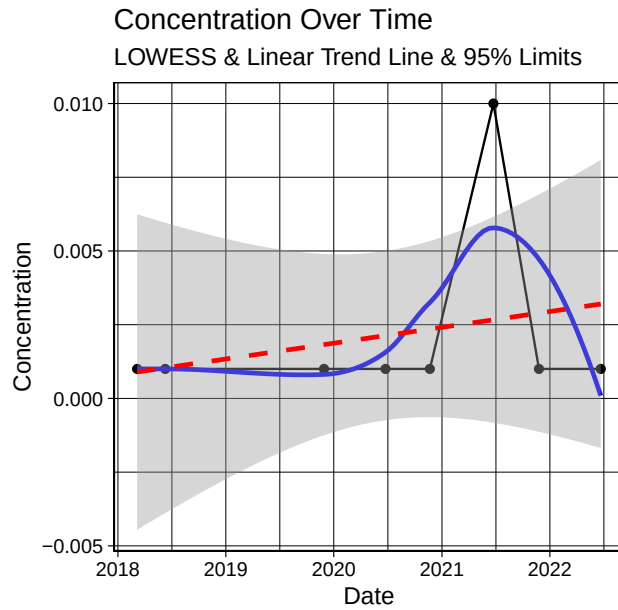
| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 8              |
| z                                     | 1.11           |
| p                                     | 0.27           |
| S                                     | 10             |
| varS                                  | 65.33          |
| tau                                   | 0.36           |
| mean                                  | 0.22           |
| sd                                    | 0.3            |
| cov                                   | 1.37           |
| results                               | NO CLEAR TREND |

Report for ID : MW138 and Analyte : PFOS



| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 8              |
| z                                     | 0.44           |
| p                                     | 0.66           |
| S                                     | 3              |
| varS                                  | 21             |
| tau                                   | 0.21           |
| mean                                  | 0              |
| sd                                    | 0              |
| cov                                   | 1.5            |
| results                               | NO CLEAR TREND |

Report for ID : MW139 and Analyte : PFOS

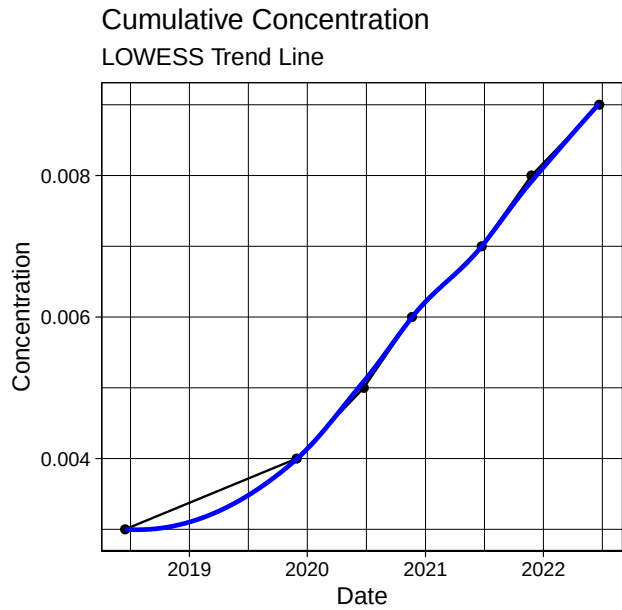
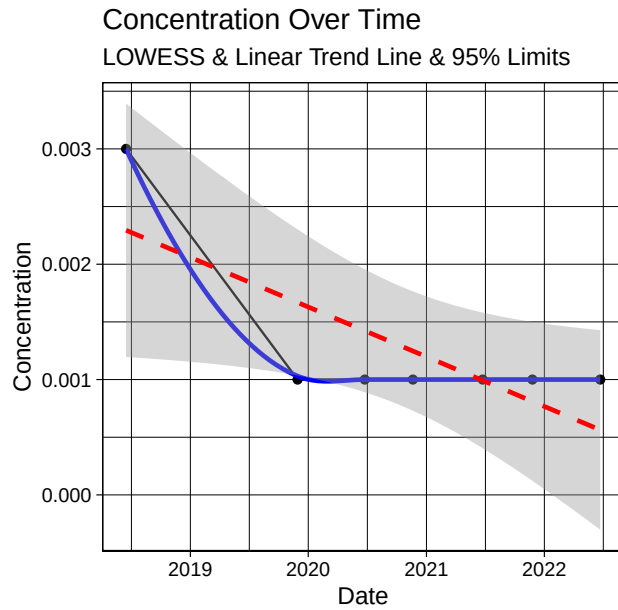


| Kendall Trend Test Results Continuous |        |
|---------------------------------------|--------|
| n                                     | 7      |
| z                                     | -1.25  |
| p                                     | 0.21   |
| S                                     | -6     |
| varS                                  | 16     |
| tau                                   | -0.53  |
| mean                                  | 0      |
| sd                                    | 0      |
| cov                                   | 0.59   |
| results                               | STABLE |

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Report for ID : MW140 and Analyte : PFOS

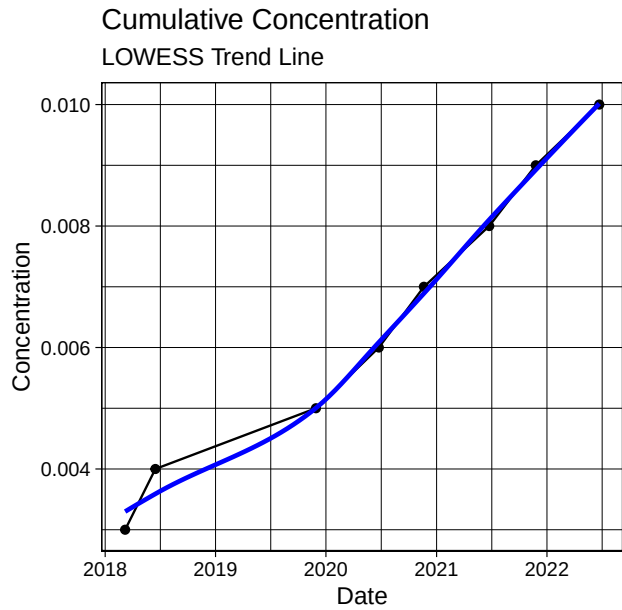
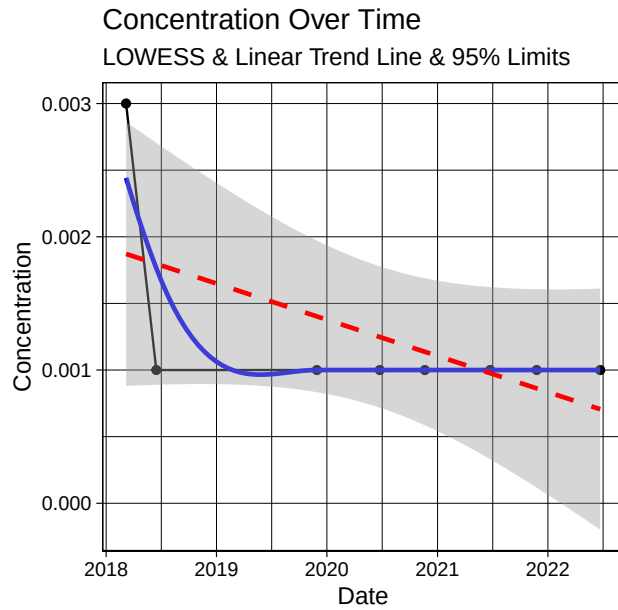
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| Kendall Trend Test Results Continuous |        |
|---------------------------------------|--------|
| n                                     | 8      |
| z                                     | -1.31  |
| p                                     | 0.19   |
| S                                     | -7     |
| varS                                  | 21     |
| tau                                   | -0.5   |
| mean                                  | 0      |
| sd                                    | 0      |
| cov                                   | 0.57   |
| results                               | STABLE |

Report for ID : MW141 and Analyte : PFOS

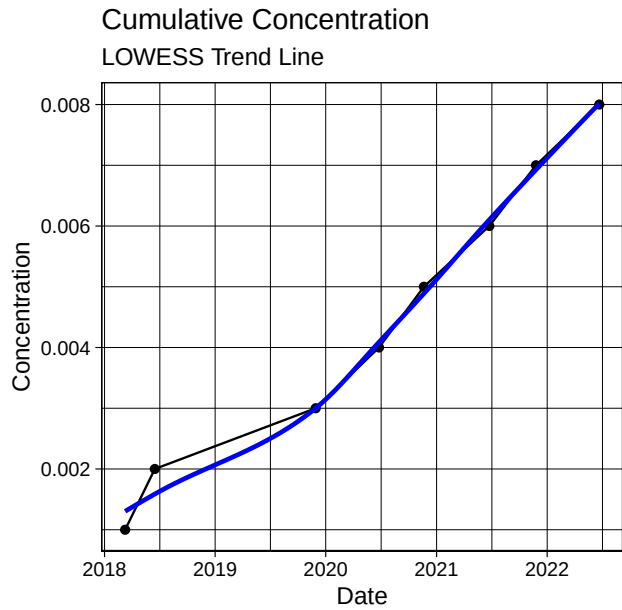
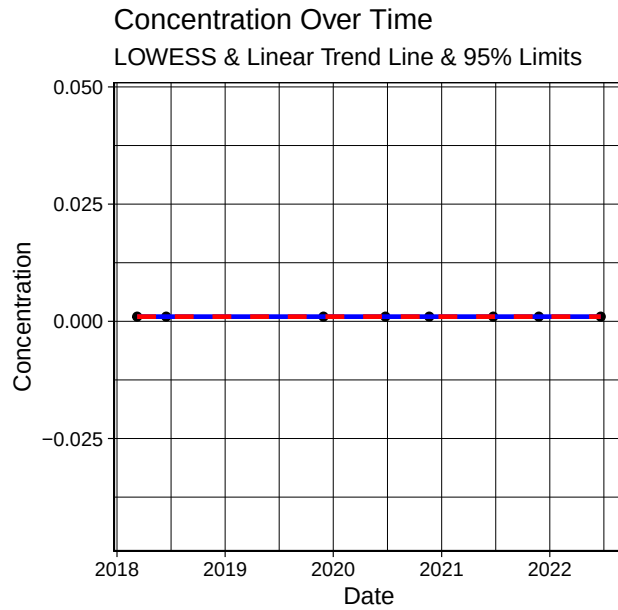


| Kendall Trend Test Results Continuous |     |
|---------------------------------------|-----|
| n                                     | 8   |
| z                                     | NaN |
| p                                     | NaN |
| S                                     | 0   |
| varS                                  | 0   |
| tau                                   | NaN |
| mean                                  | 0   |
| sd                                    | 0   |
| cov                                   | 0   |
| results                               | NA  |

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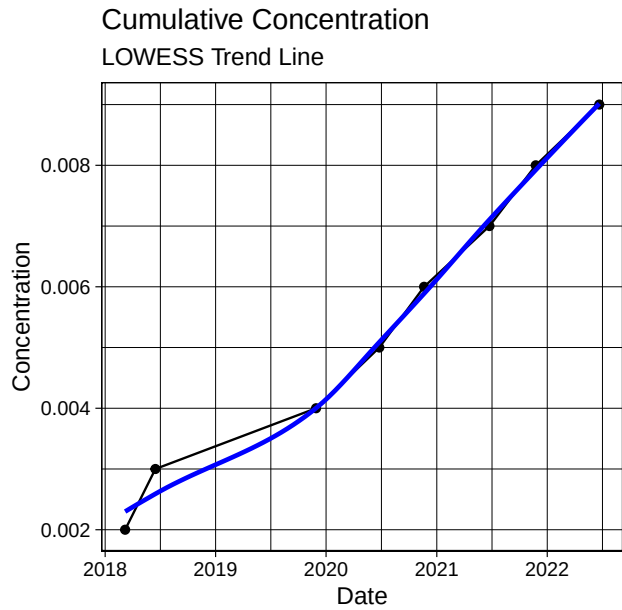
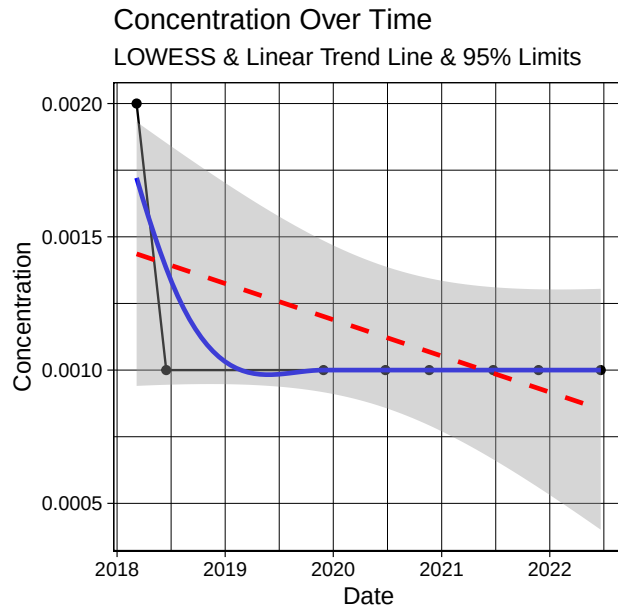
Report for ID : MW143 and Analyte : PFOS

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| Kendall Trend Test Results Continuous |        |
|---------------------------------------|--------|
| n                                     | 8      |
| z                                     | -1.31  |
| p                                     | 0.19   |
| S                                     | -7     |
| varS                                  | 21     |
| tau                                   | -0.5   |
| mean                                  | 0      |
| sd                                    | 0      |
| cov                                   | 0.31   |
| results                               | STABLE |

Report for ID : MW144 and Analyte : PFOS

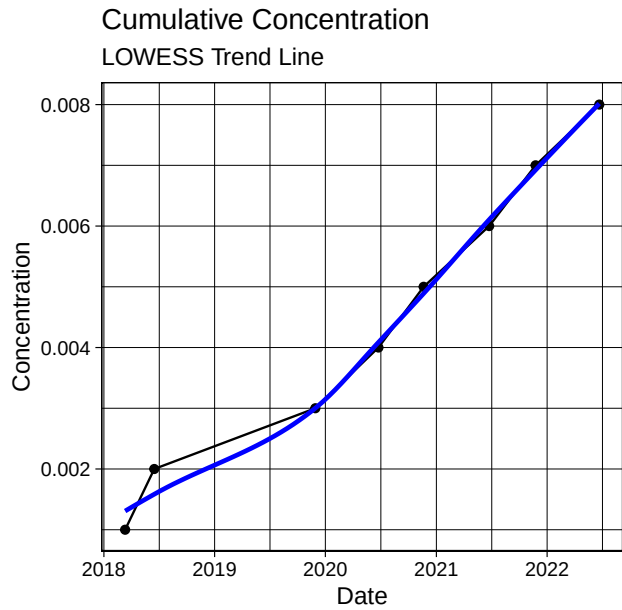
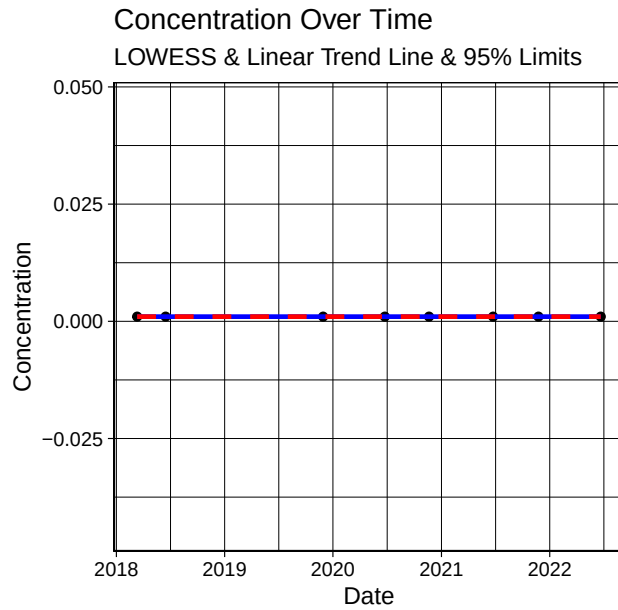


| Kendall Trend Test Results Continuous |     |
|---------------------------------------|-----|
| n                                     | 8   |
| z                                     | NaN |
| p                                     | NaN |
| S                                     | 0   |
| varS                                  | 0   |
| tau                                   | NaN |
| mean                                  | 0   |
| sd                                    | 0   |
| cov                                   | 0   |
| results                               | NA  |

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Report for ID : MW145 and Analyte : PFOS

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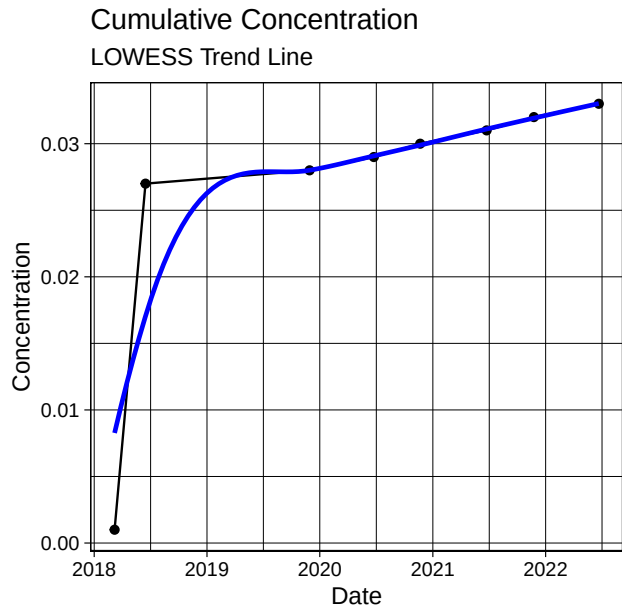
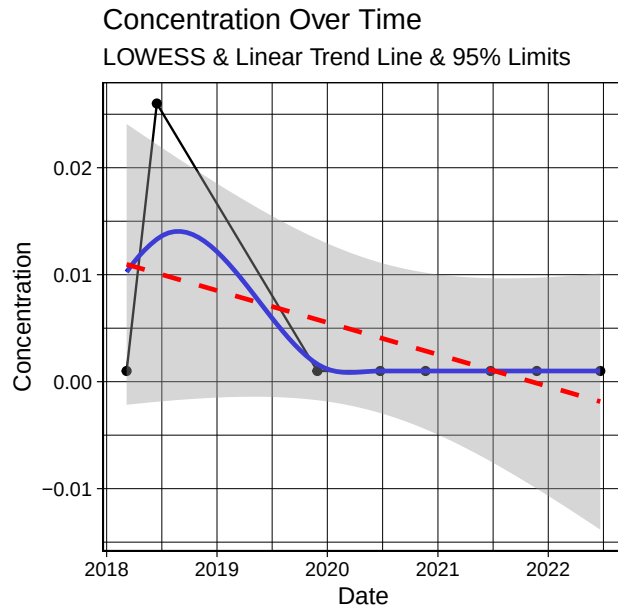


| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 8              |
| z                                     | -0.87          |
| p                                     | 0.38           |
| S                                     | -5             |
| varS                                  | 21             |
| tau                                   | -0.36          |
| mean                                  | 0              |
| sd                                    | 0.01           |
| cov                                   | 2.14           |
| results                               | NO CLEAR TREND |

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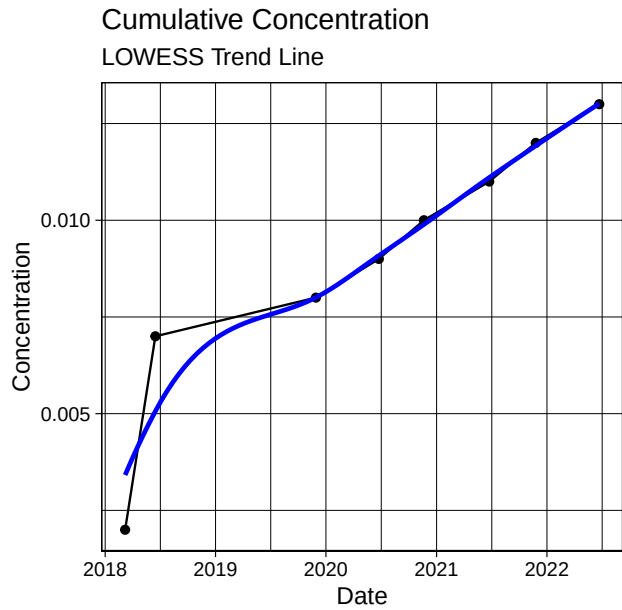
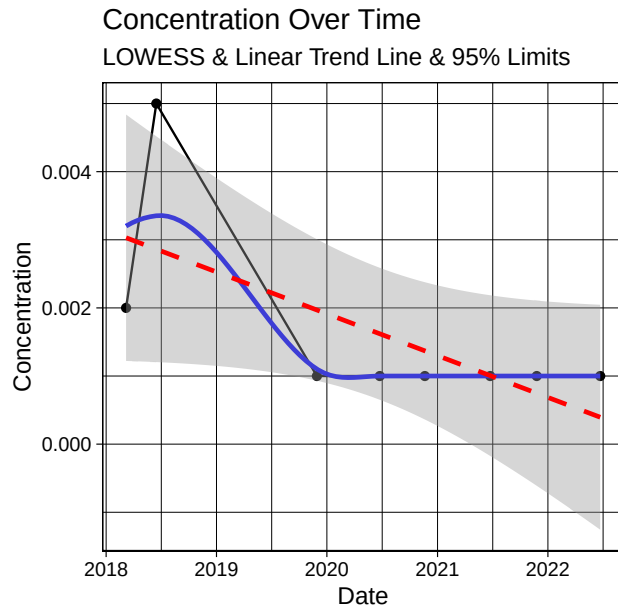
Report for ID : MW146 and Analyte : PFOS

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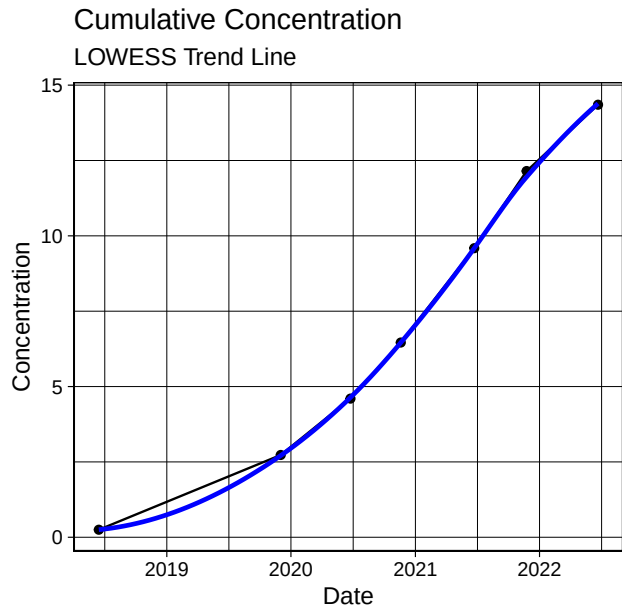
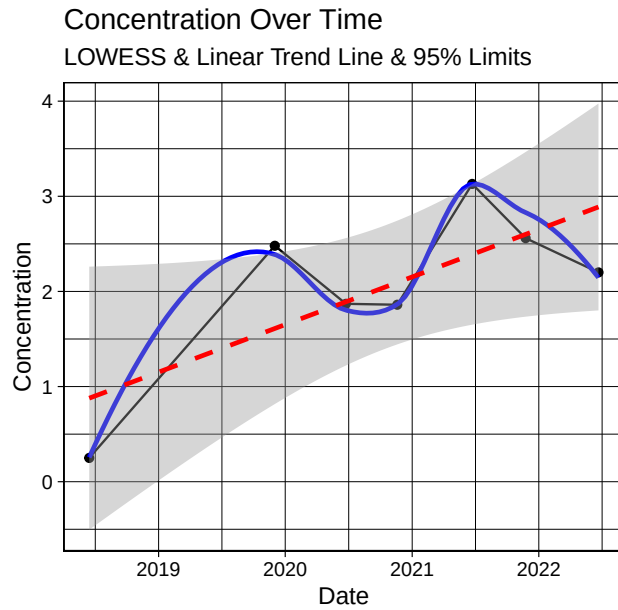
| Kendall Trend Test Results Continuous |        |
|---------------------------------------|--------|
| n                                     | 8      |
| z                                     | -1.64  |
| p                                     | 0.1    |
| S                                     | -11    |
| varS                                  | 37     |
| tau                                   | -0.58  |
| mean                                  | 0      |
| sd                                    | 0      |
| cov                                   | 0.87   |
| results                               | STABLE |

Report for ID : MW147 and Analyte : PFOS



| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 7              |
| z                                     | 0.9            |
| p                                     | 0.37           |
| S                                     | 7              |
| varS                                  | 44.33          |
| tau                                   | 0.33           |
| mean                                  | 2.05           |
| sd                                    | 0.91           |
| cov                                   | 0.44           |
| results                               | NO CLEAR TREND |

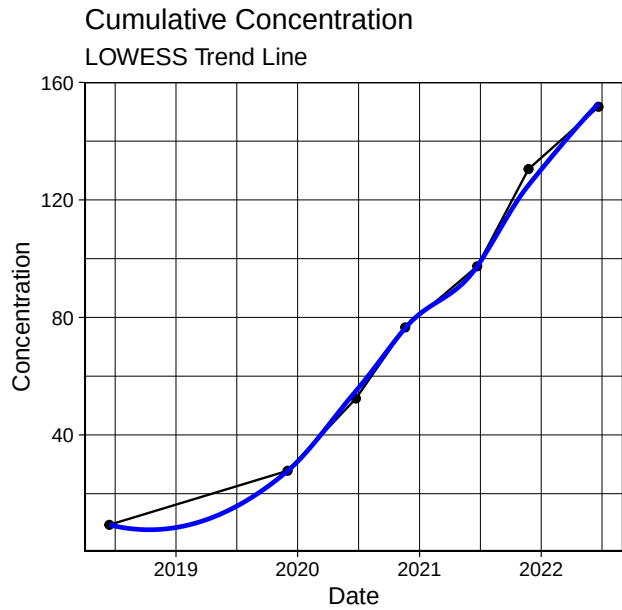
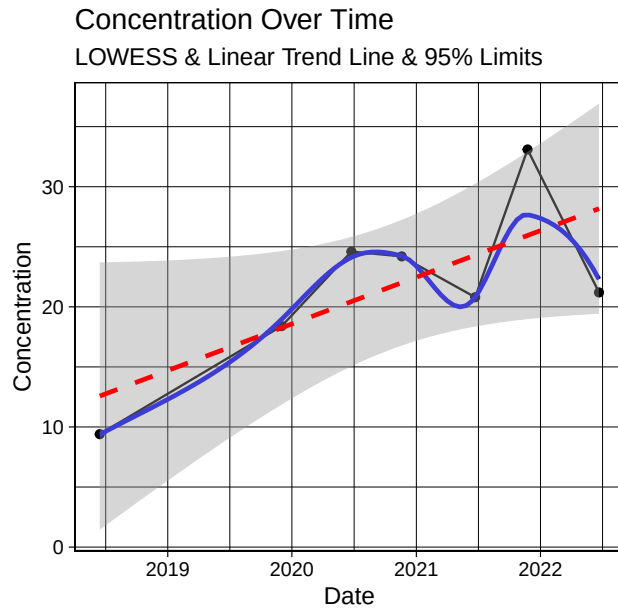
Report for ID : MW148D and Analyte : PFOS





| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 7              |
| z                                     | 1.2            |
| p                                     | 0.23           |
| S                                     | 9              |
| varS                                  | 44.33          |
| tau                                   | 0.43           |
| mean                                  | 21.67          |
| sd                                    | 7.16           |
| cov                                   | 0.33           |
| results                               | NO CLEAR TREND |

Report for ID : MW148S and Analyte : PFOS

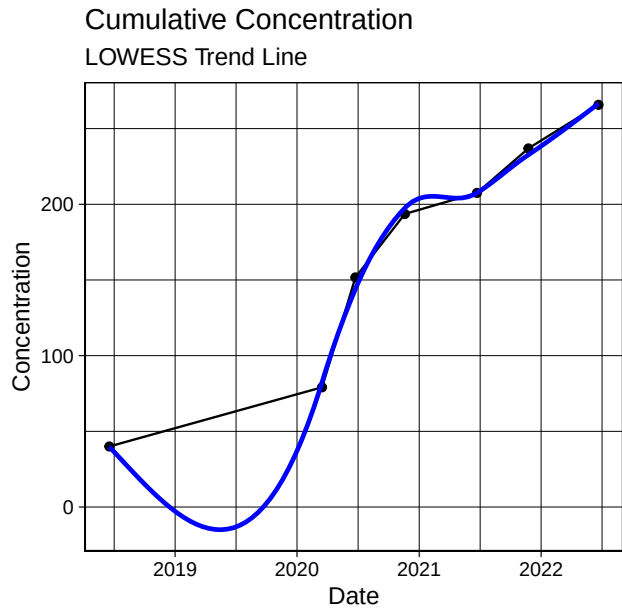
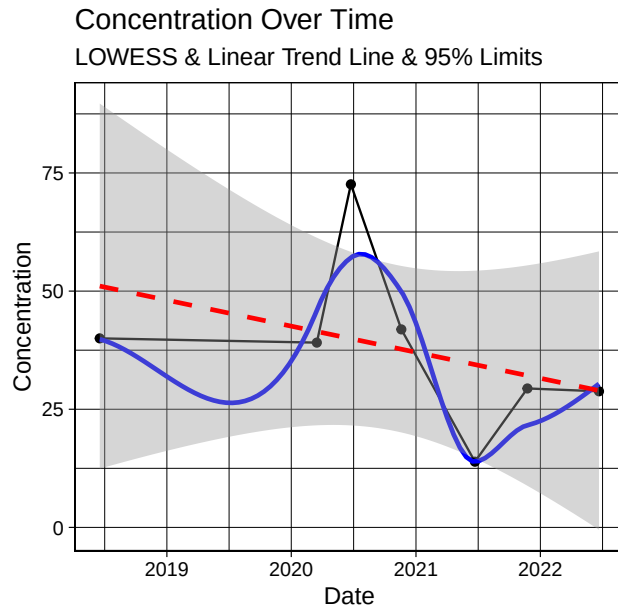


| Kendall Trend Test Results Continuous |        |
|---------------------------------------|--------|
| n                                     | 7      |
| z                                     | -1.2   |
| p                                     | 0.23   |
| S                                     | -9     |
| varS                                  | 44.33  |
| tau                                   | -0.43  |
| mean                                  | 37.96  |
| sd                                    | 18.06  |
| cov                                   | 0.48   |
| results                               | STABLE |

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Report for ID : MW151 and Analyte : PFOS

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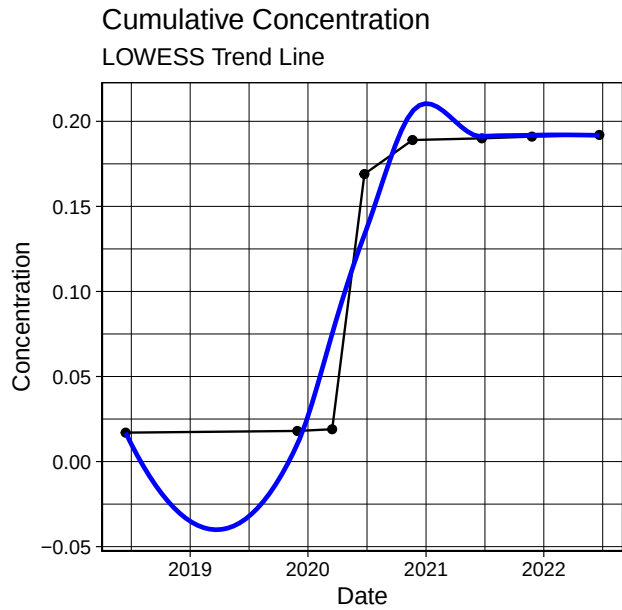
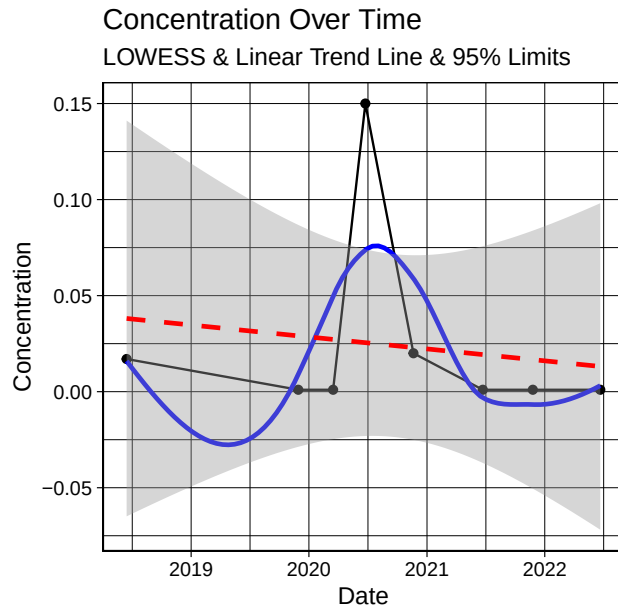


| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 8              |
| z                                     | -0.72          |
| p                                     | 0.47           |
| S                                     | -6             |
| varS                                  | 48.67          |
| tau                                   | -0.27          |
| mean                                  | 0.02           |
| sd                                    | 0.05           |
| cov                                   | 2.15           |
| results                               | NO CLEAR TREND |

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Report for ID : MW159 and Analyte : PFOS

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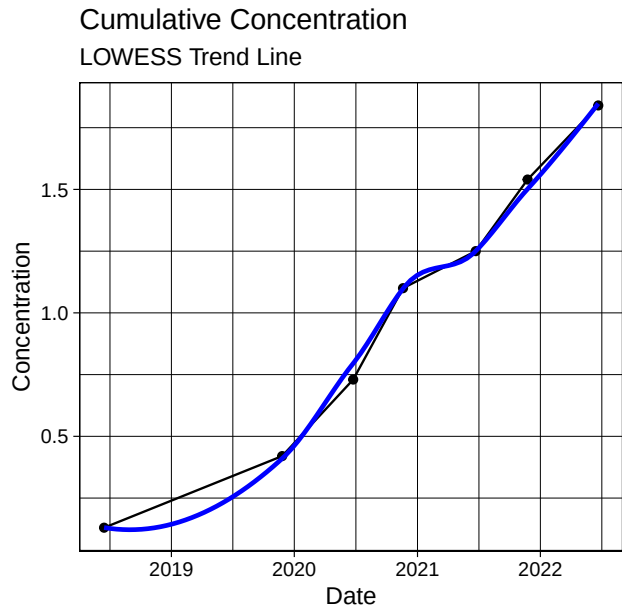
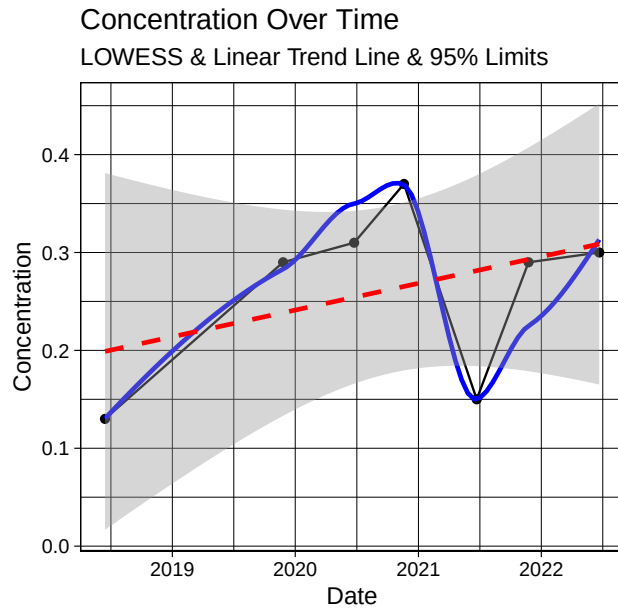


| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 7              |
| z                                     | 0.76           |
| p                                     | 0.45           |
| S                                     | 6              |
| varS                                  | 43.33          |
| tau                                   | 0.29           |
| mean                                  | 0.26           |
| sd                                    | 0.09           |
| cov                                   | 0.34           |
| results                               | NO CLEAR TREND |

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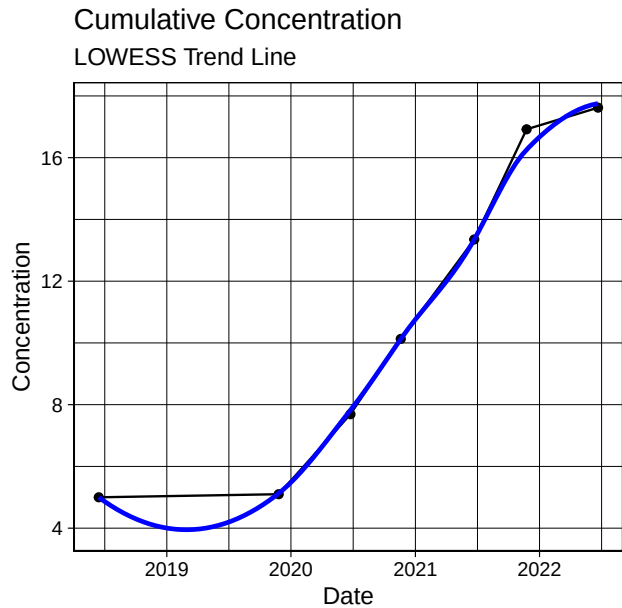
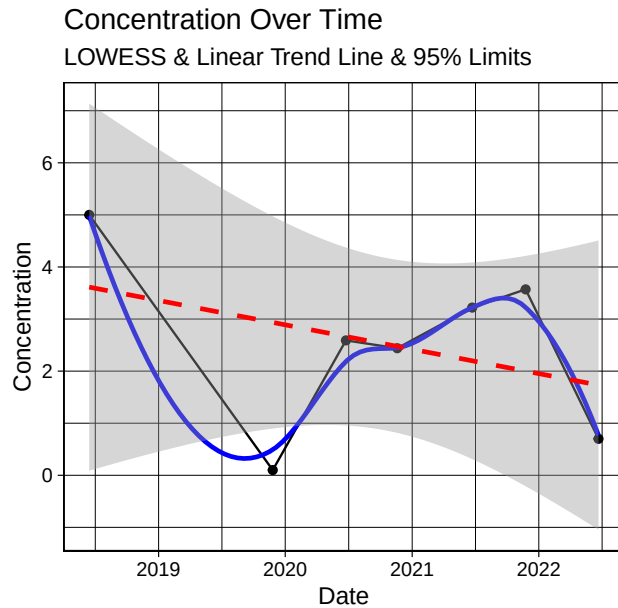
Report for ID : MW162 and Analyte : PFOS

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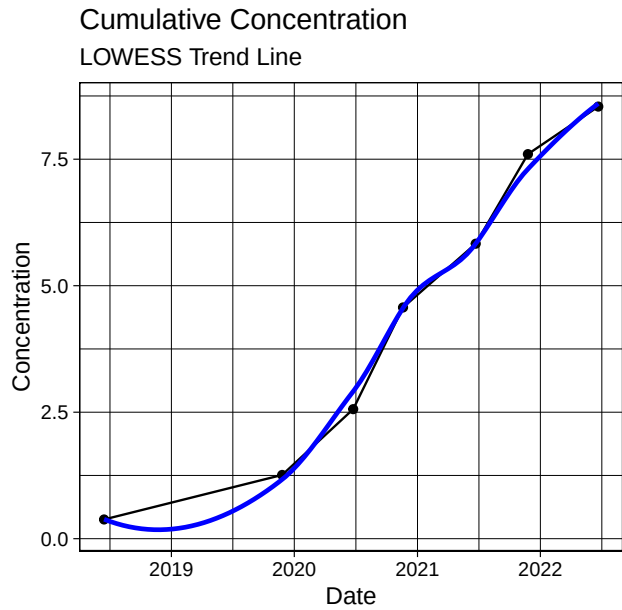
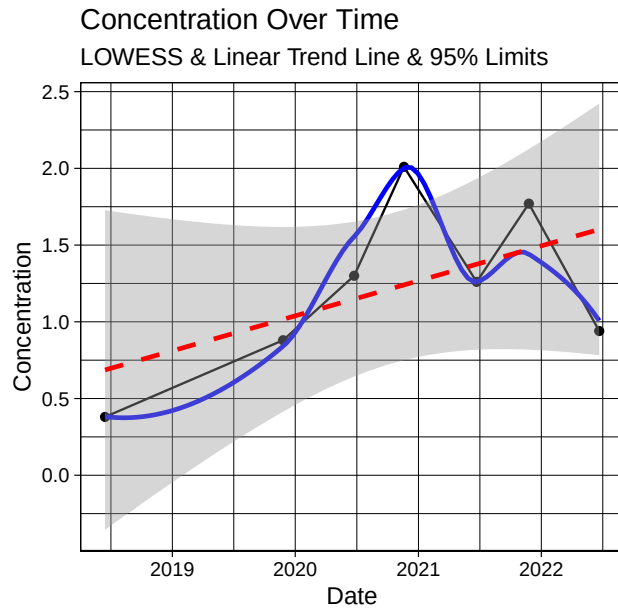
| Kendall Trend Test Results Continuous |        |
|---------------------------------------|--------|
| n                                     | 7      |
| z                                     | 0      |
| p                                     | 1      |
| S                                     | -1     |
| varS                                  | 44.33  |
| tau                                   | -0.05  |
| mean                                  | 2.52   |
| sd                                    | 1.68   |
| cov                                   | 0.67   |
| results                               | STABLE |

Report for ID : MW163 and Analyte : PFOS



| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 7              |
| z                                     | 0.9            |
| p                                     | 0.37           |
| S                                     | 7              |
| varS                                  | 44.33          |
| tau                                   | 0.33           |
| mean                                  | 1.22           |
| sd                                    | 0.55           |
| cov                                   | 0.45           |
| results                               | NO CLEAR TREND |

Report for ID : MW164 and Analyte : PFOS

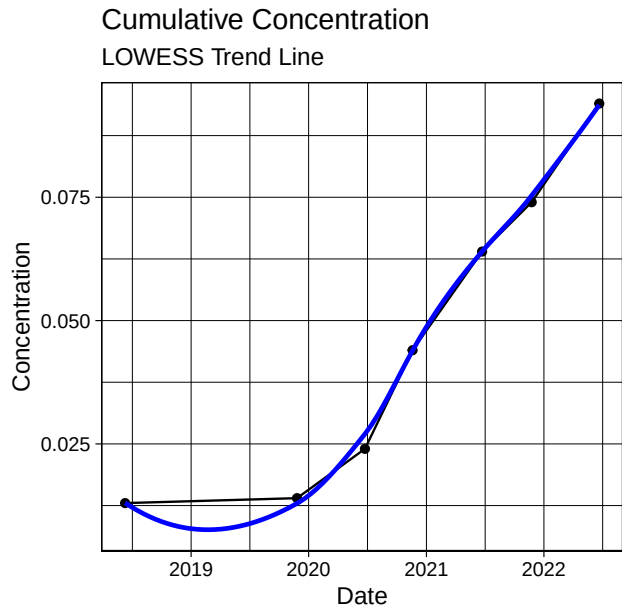
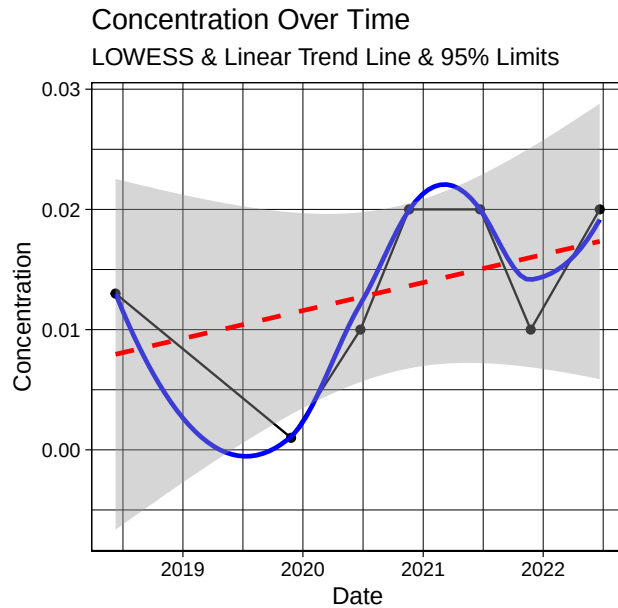


| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 7              |
| z                                     | 0.95           |
| p                                     | 0.34           |
| S                                     | 7              |
| varS                                  | 39.67          |
| tau                                   | 0.37           |
| mean                                  | 0.01           |
| sd                                    | 0.01           |
| cov                                   | 0.53           |
| results                               | NO CLEAR TREND |

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Report for ID : MW165 and Analyte : PFOS

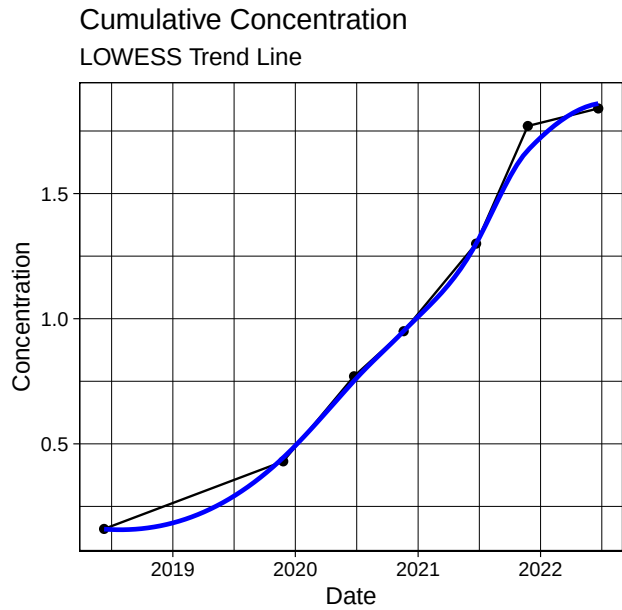
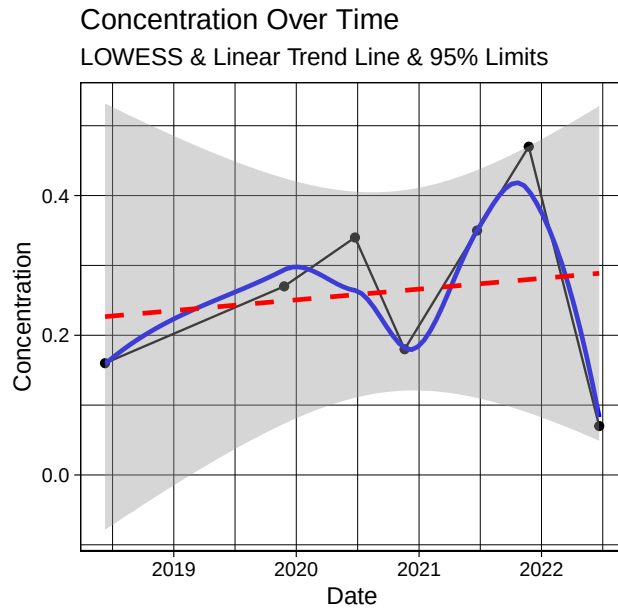
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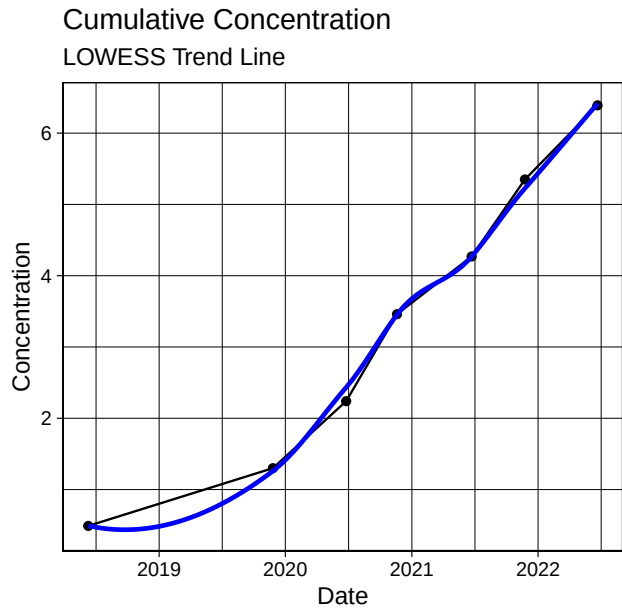
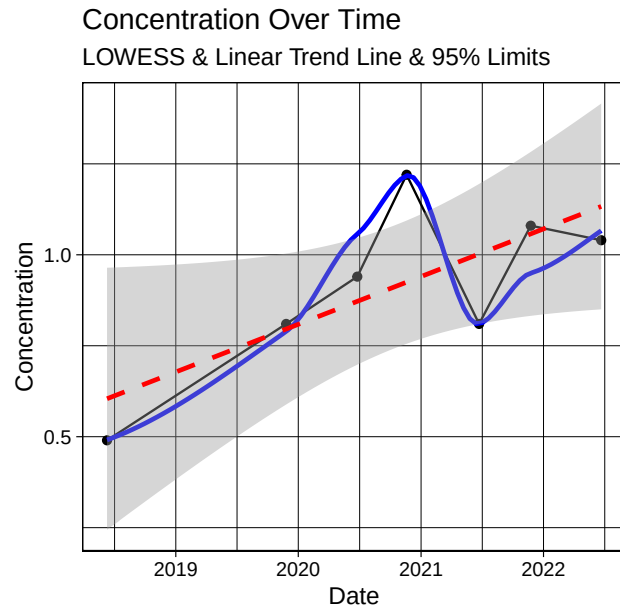
| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 7              |
| z                                     | 0.6            |
| p                                     | 0.55           |
| S                                     | 5              |
| varS                                  | 44.33          |
| tau                                   | 0.24           |
| mean                                  | 0.26           |
| sd                                    | 0.14           |
| cov                                   | 0.52           |
| results                               | NO CLEAR TREND |

Report for ID : MW166 and Analyte : PFOS



| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 7              |
| z                                     | 1.37           |
| p                                     | 0.17           |
| S                                     | 10             |
| varS                                  | 43.33          |
| tau                                   | 0.49           |
| mean                                  | 0.91           |
| sd                                    | 0.24           |
| cov                                   | 0.26           |
| results                               | NO CLEAR TREND |

Report for ID : MW167 and Analyte : PFOS

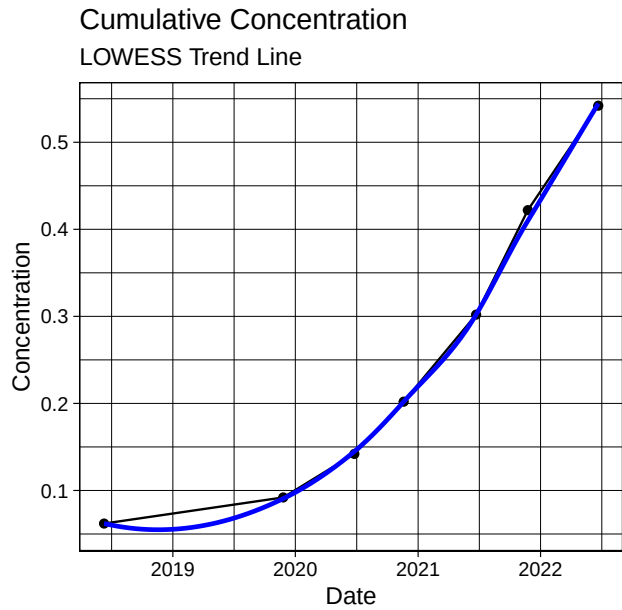
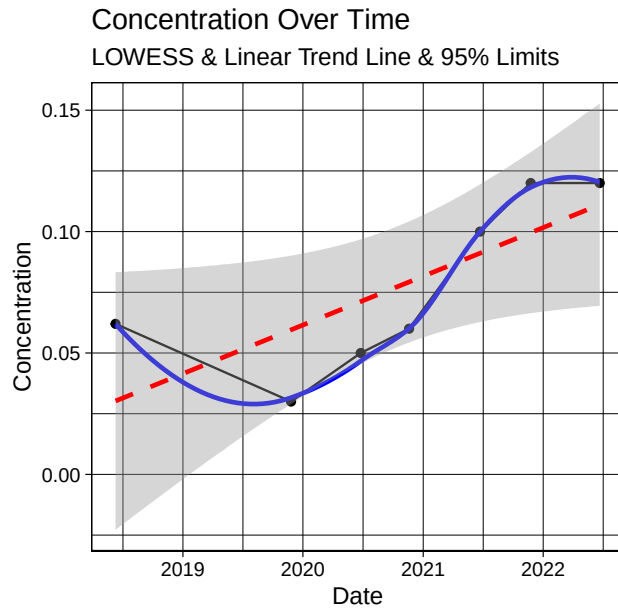


| Kendall Trend Test Results Continuous |            |
|---------------------------------------|------------|
| n                                     | 7          |
| z                                     | 1.97       |
| p                                     | 0.05       |
| S                                     | 14         |
| varS                                  | 43.33      |
| tau                                   | 0.68       |
| mean                                  | 0.08       |
| sd                                    | 0.04       |
| cov                                   | 0.46       |
| results                               | INCREASING |

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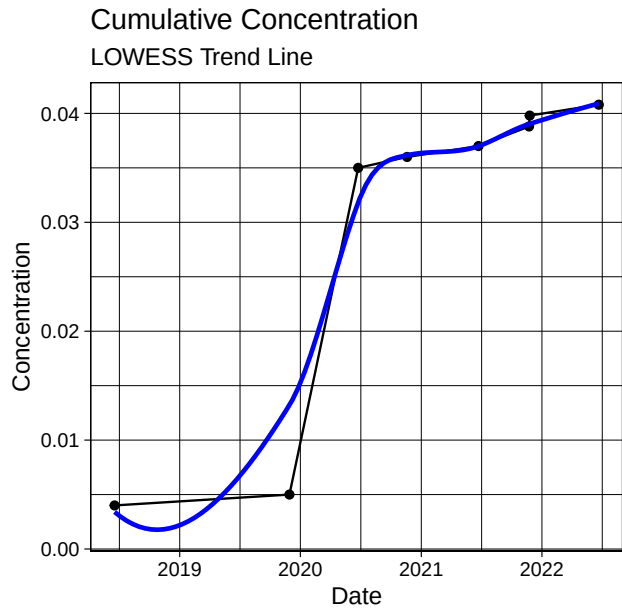
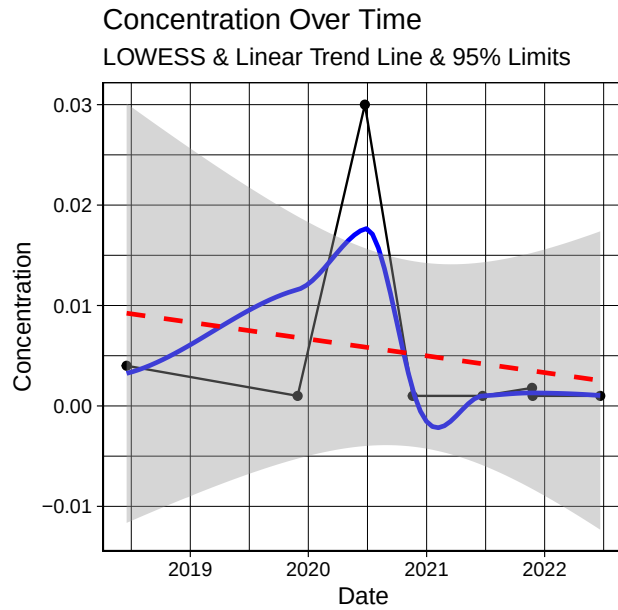
Report for ID : MW168 and Analyte : PFOS

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| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 8              |
| z                                     | -1             |
| p                                     | 0.32           |
| S                                     | -8             |
| varS                                  | 48.67          |
| tau                                   | -0.36          |
| mean                                  | 0.01           |
| sd                                    | 0.01           |
| cov                                   | 1.98           |
| results                               | NO CLEAR TREND |

Report for ID : MW170 and Analyte : PFOS

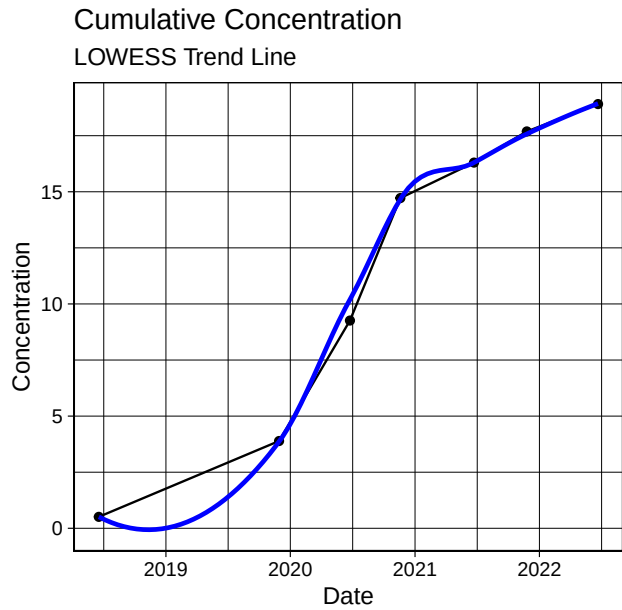
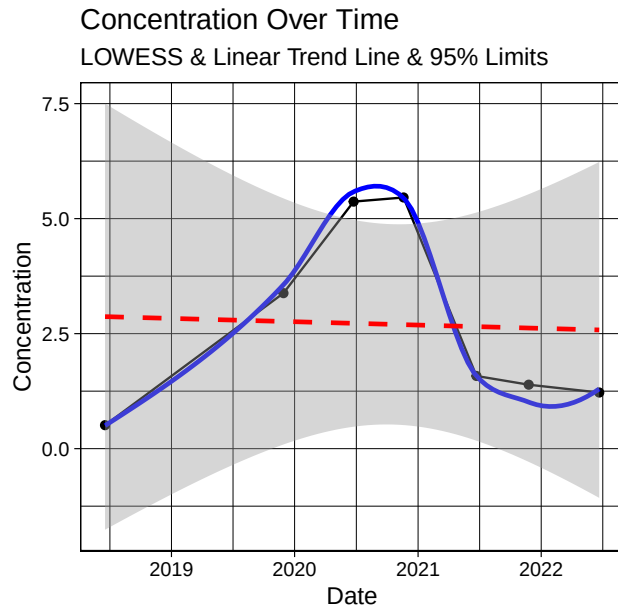


| Kendall Trend Test Results Continuous |        |
|---------------------------------------|--------|
| n                                     | 7      |
| z                                     | -0.3   |
| p                                     | 0.76   |
| S                                     | -3     |
| varS                                  | 44.33  |
| tau                                   | -0.14  |
| mean                                  | 2.7    |
| sd                                    | 2.05   |
| cov                                   | 0.76   |
| results                               | STABLE |

---

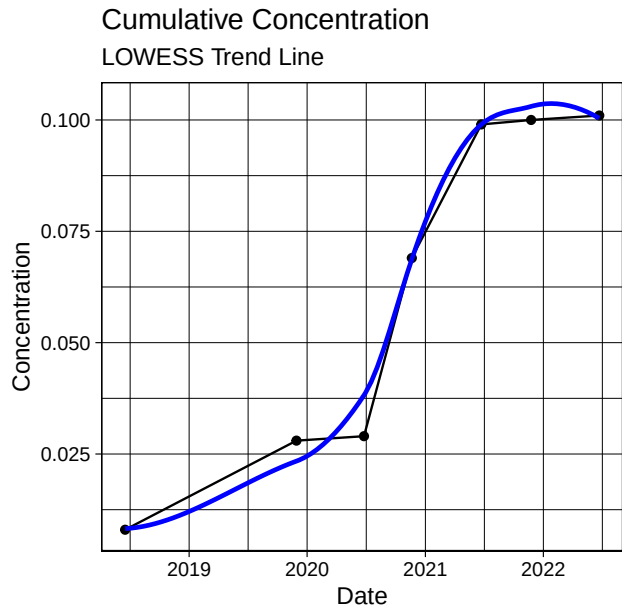
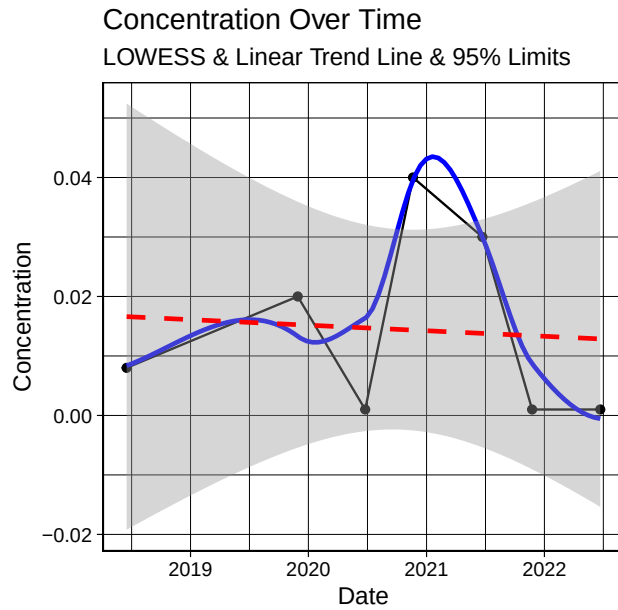
Report for ID : MW172 and Analyte : PFOS

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| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 7              |
| z                                     | -0.47          |
| p                                     | 0.64           |
| S                                     | -4             |
| varS                                  | 40.67          |
| tau                                   | -0.21          |
| mean                                  | 0.01           |
| sd                                    | 0.02           |
| cov                                   | 1.1            |
| results                               | NO CLEAR TREND |

Report for ID : MW175 and Analyte : PFOS

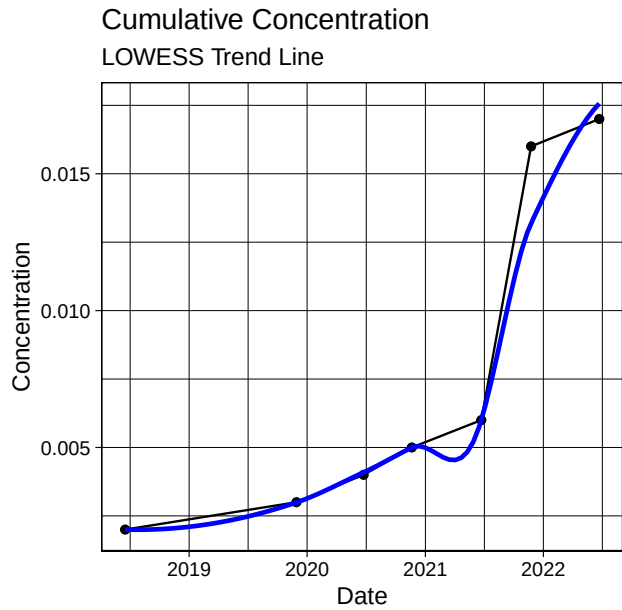
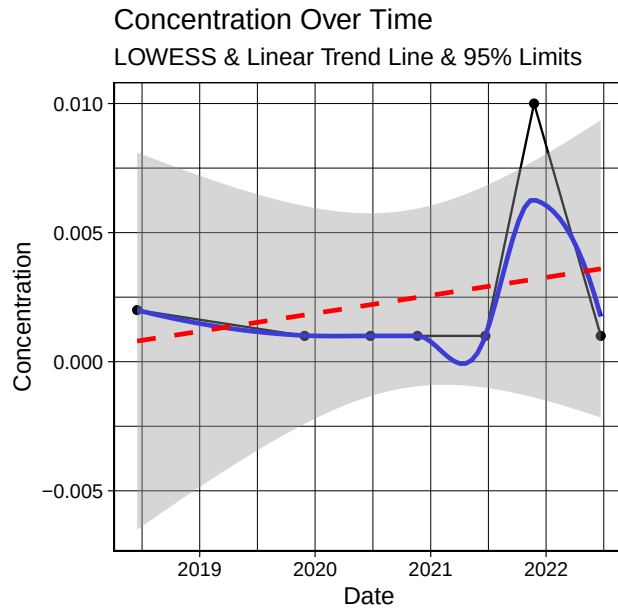


| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 7              |
| z                                     | 0              |
| p                                     | 1              |
| S                                     | -1             |
| varS                                  | 27.67          |
| tau                                   | -0.07          |
| mean                                  | 0              |
| sd                                    | 0              |
| cov                                   | 1.38           |
| results                               | NO CLEAR TREND |

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Report for ID : MW176 and Analyte : PFOS

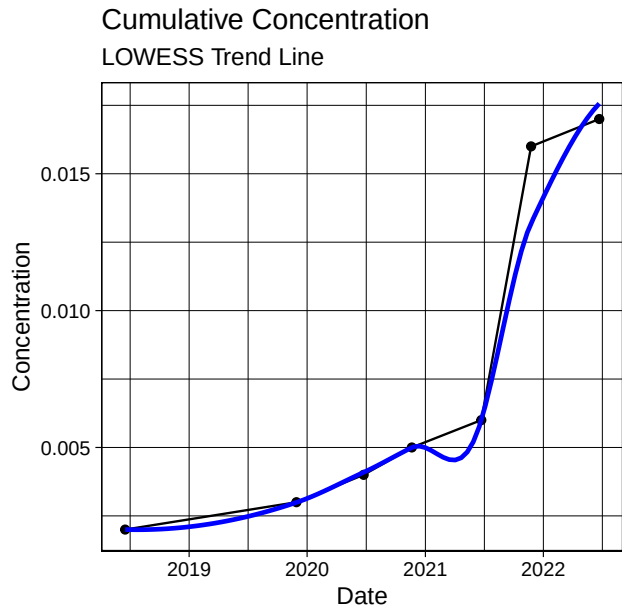
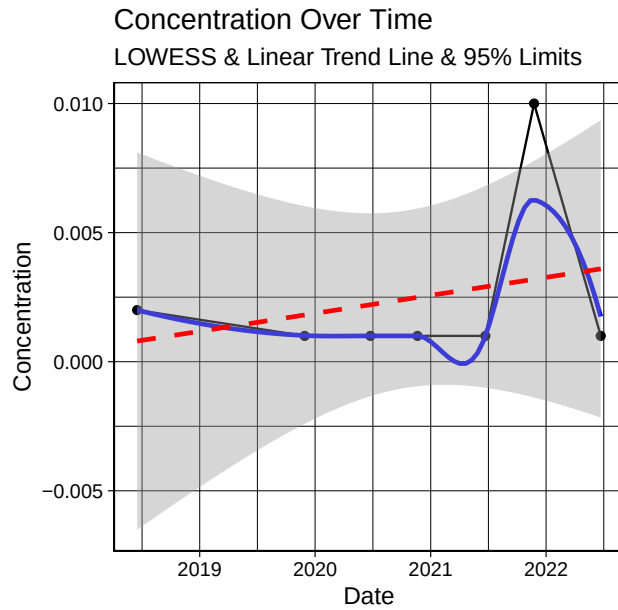
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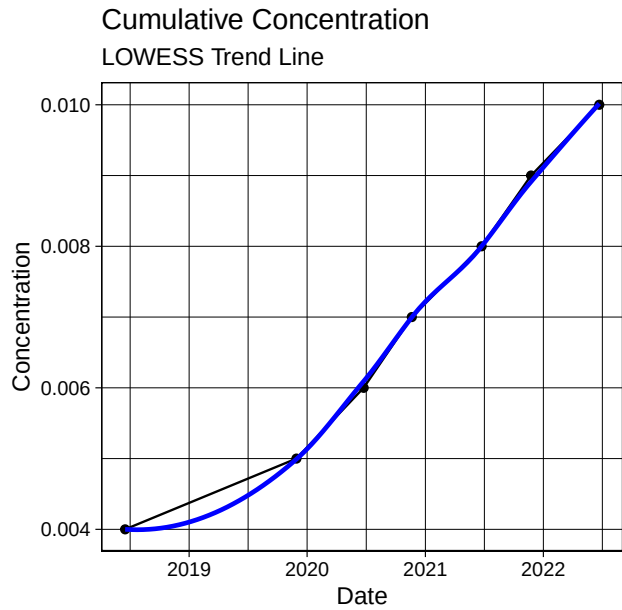
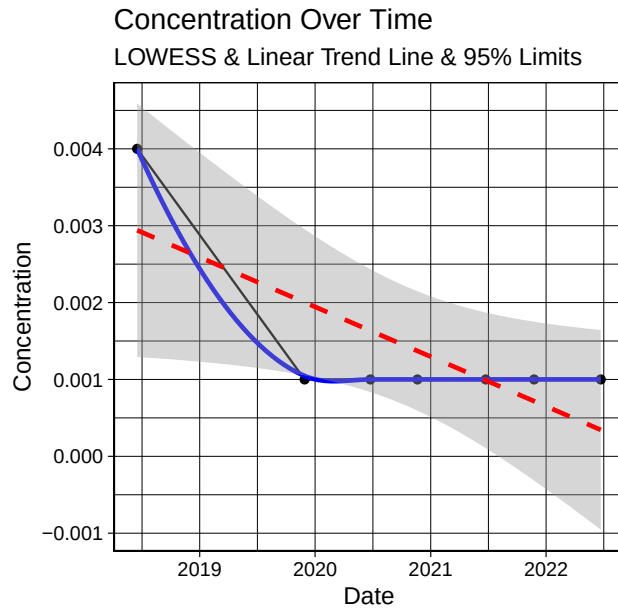
| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 7              |
| z                                     | 0              |
| p                                     | 1              |
| S                                     | -1             |
| varS                                  | 27.67          |
| tau                                   | -0.07          |
| mean                                  | 0              |
| sd                                    | 0              |
| cov                                   | 1.38           |
| results                               | NO CLEAR TREND |

Report for ID : MW177 and Analyte : PFOS



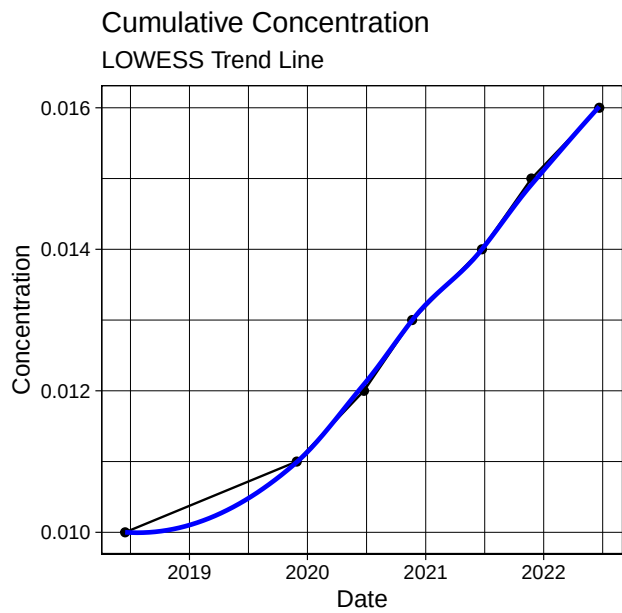
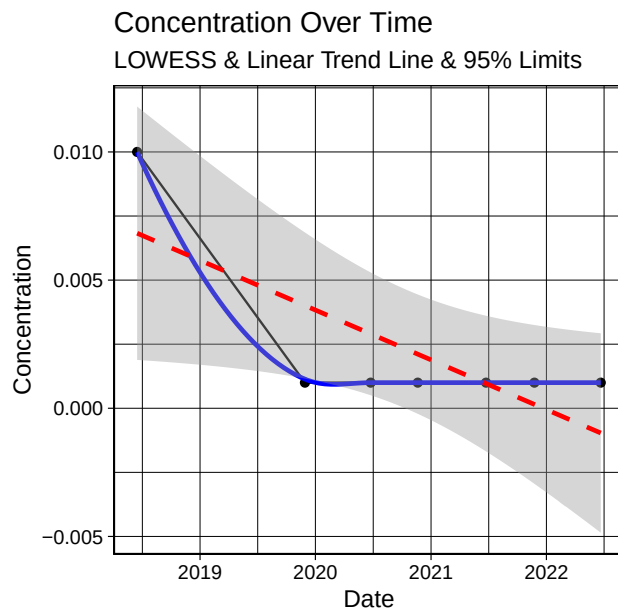
| Kendall Trend Test Results Continuous |        |
|---------------------------------------|--------|
| n                                     | 7      |
| z                                     | -1.25  |
| p                                     | 0.21   |
| S                                     | -6     |
| varS                                  | 16     |
| tau                                   | -0.53  |
| mean                                  | 0      |
| sd                                    | 0      |
| cov                                   | 0.79   |
| results                               | STABLE |

Report for ID : MW178 and Analyte : PFOS



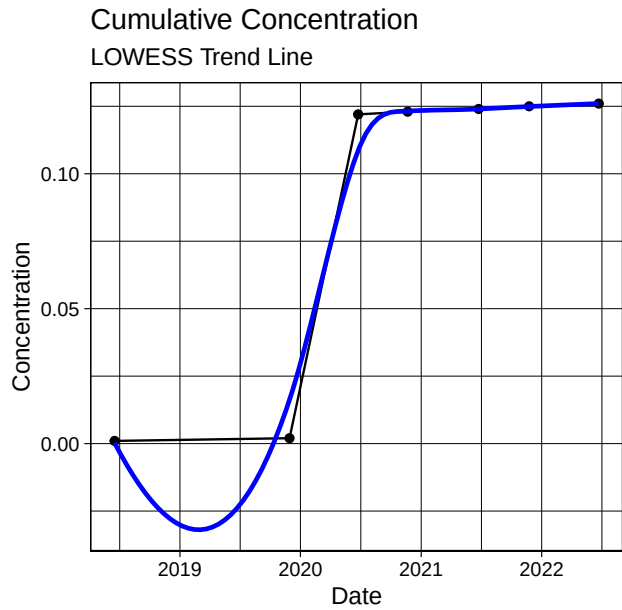
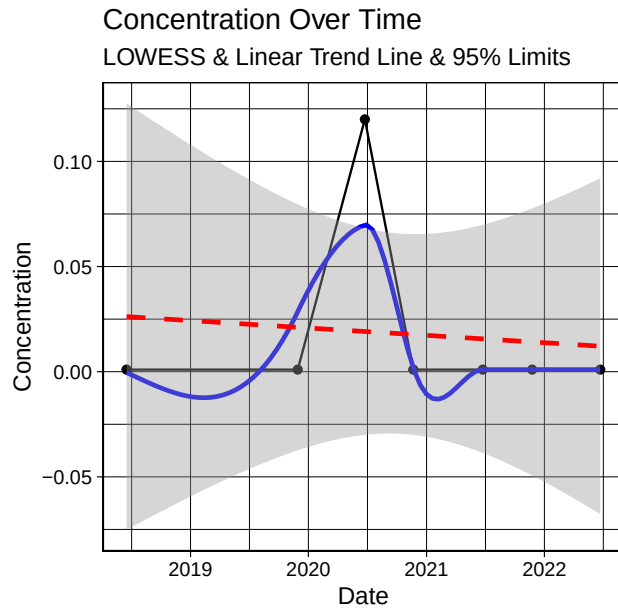
| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 7              |
| z                                     | -1.25          |
| p                                     | 0.21           |
| S                                     | -6             |
| varS                                  | 16             |
| tau                                   | -0.53          |
| mean                                  | 0              |
| sd                                    | 0              |
| cov                                   | 1.49           |
| results                               | NO CLEAR TREND |

Report for ID : MW179 and Analyte : PFOS



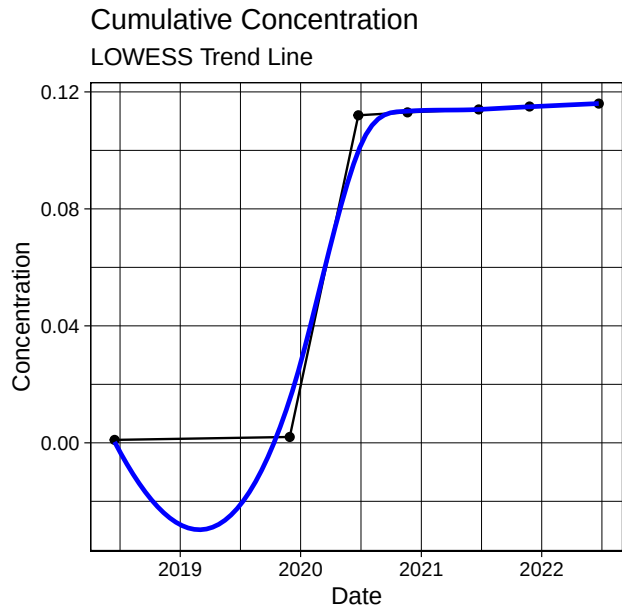
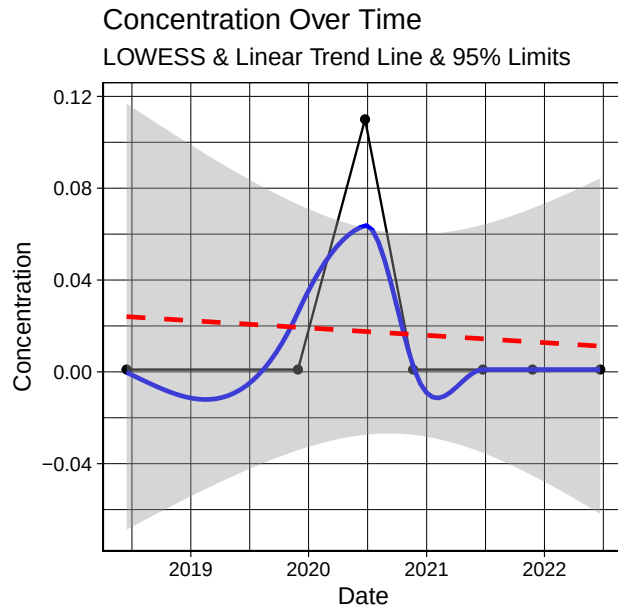
| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 7              |
| z                                     | -0.25          |
| p                                     | 0.8            |
| S                                     | -2             |
| varS                                  | 16             |
| tau                                   | -0.18          |
| mean                                  | 0.02           |
| sd                                    | 0.04           |
| cov                                   | 2.5            |
| results                               | NO CLEAR TREND |

Report for ID : MW180 and Analyte : PFOS



| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 7              |
| z                                     | -0.25          |
| p                                     | 0.8            |
| S                                     | -2             |
| varS                                  | 16             |
| tau                                   | -0.18          |
| mean                                  | 0.02           |
| sd                                    | 0.04           |
| cov                                   | 2.49           |
| results                               | NO CLEAR TREND |

Report for ID : MW181 and Analyte : PFOS

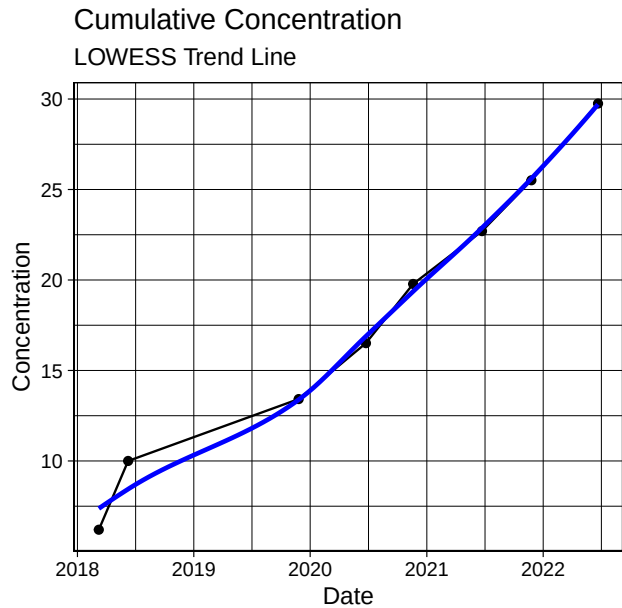
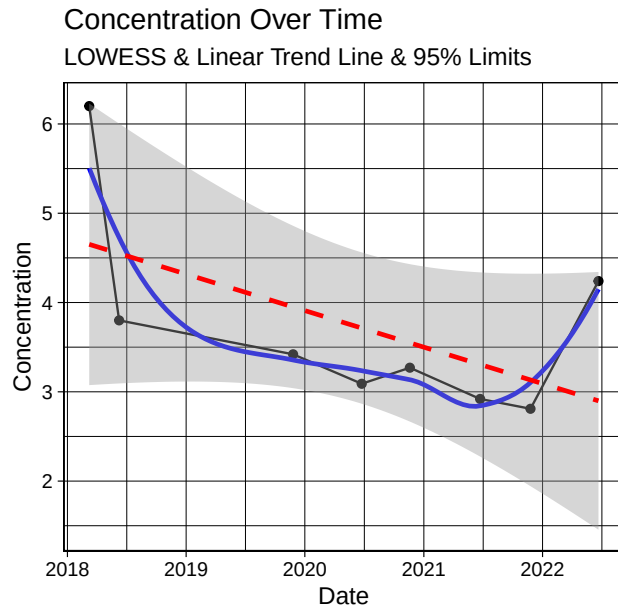


| Kendall Trend Test Results Continuous |        |
|---------------------------------------|--------|
| n                                     | 8      |
| z                                     | -1.61  |
| p                                     | 0.11   |
| S                                     | -14    |
| varS                                  | 65.33  |
| tau                                   | -0.5   |
| mean                                  | 3.72   |
| sd                                    | 1.11   |
| cov                                   | 0.3    |
| results                               | STABLE |

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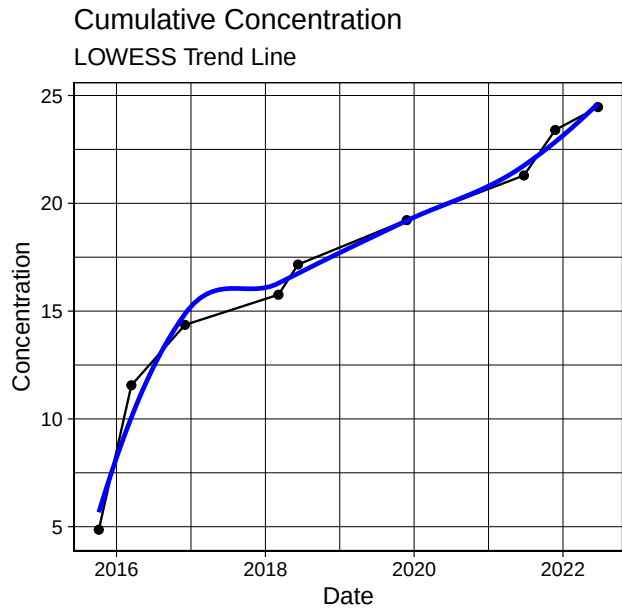
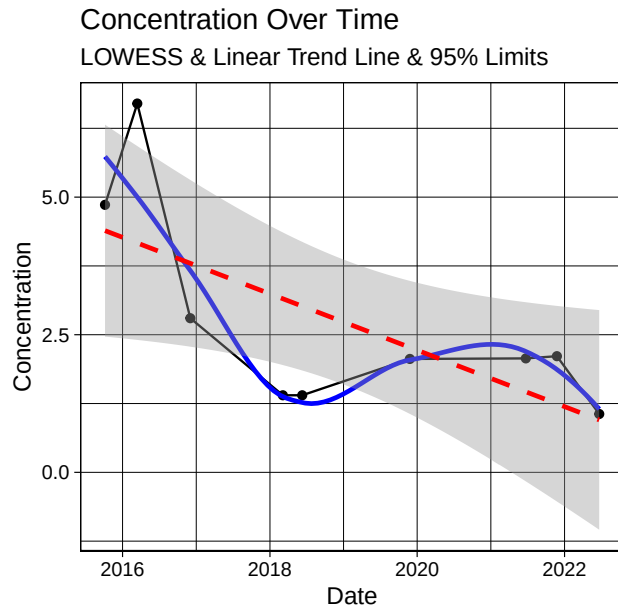
Report for ID : MW211 and Analyte : PFOS

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| Kendall Trend Test Results Continuous |        |
|---------------------------------------|--------|
| n                                     | 9      |
| z                                     | -1.47  |
| p                                     | 0.14   |
| S                                     | -15    |
| varS                                  | 91     |
| tau                                   | -0.42  |
| mean                                  | 2.72   |
| sd                                    | 1.87   |
| cov                                   | 0.69   |
| results                               | STABLE |

Report for ID : MW233 and Analyte : PFOS





# Trend Report

Report Date & Time: 2023-03-09 07:56:49

Data File Name: 0960\_inputPFOS+PFHxS2022.csv

Report Title: Groundwater PFOS+PFHxS Trend

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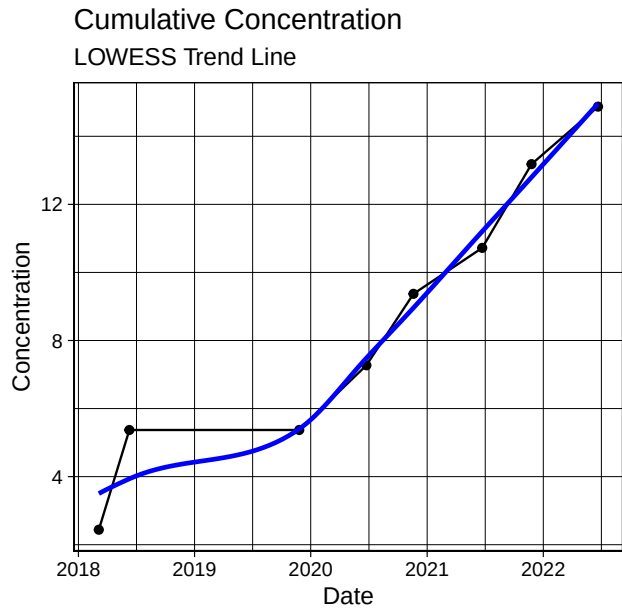
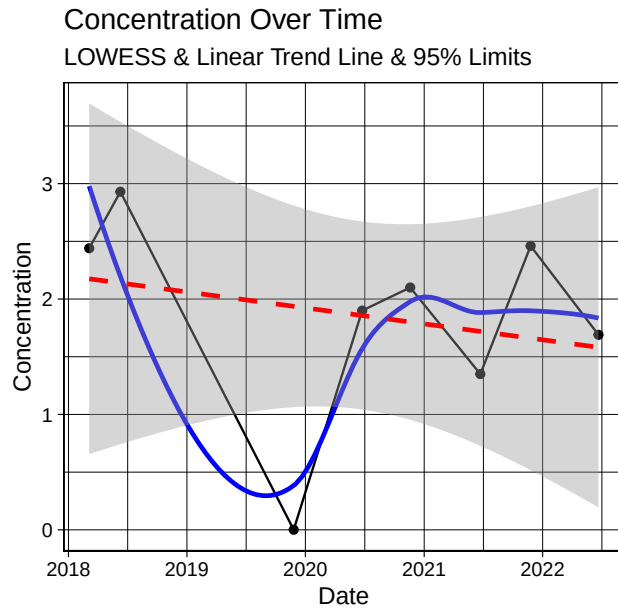
We encourage the reporting of bugs, issues, new ideas and contributions. If you want to report a bug, issue or have an idea to add to Open UCL you can email [openstatsonline@gmail.com](mailto:openstatsonline@gmail.com). Or if you are on github you can also use this link to post an issue on the Open UCL Repository.

| Kendall Trend Test Results Continuous |        |
|---------------------------------------|--------|
| n                                     | 8      |
| z                                     | -0.37  |
| p                                     | 0.71   |
| S                                     | -4     |
| varS                                  | 65.33  |
| tau                                   | -0.14  |
| mean                                  | 1.86   |
| sd                                    | 0.9    |
| cov                                   | 0.48   |
| results                               | STABLE |

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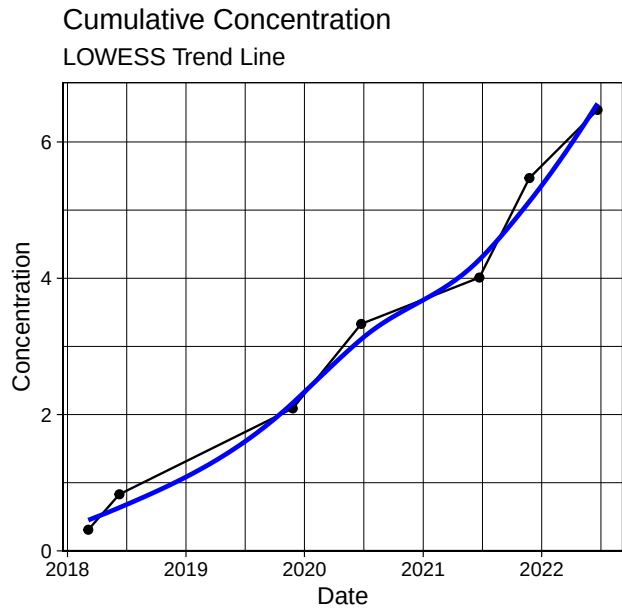
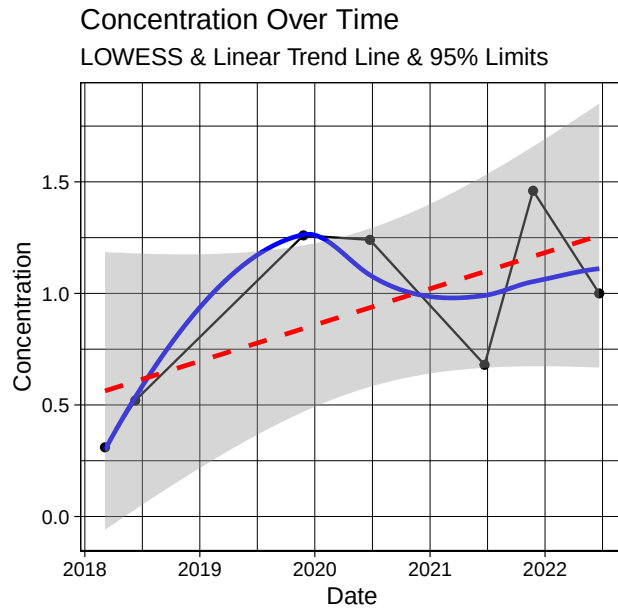
Report for ID : MW018 and Analyte : SumofPFOSandPFHxS

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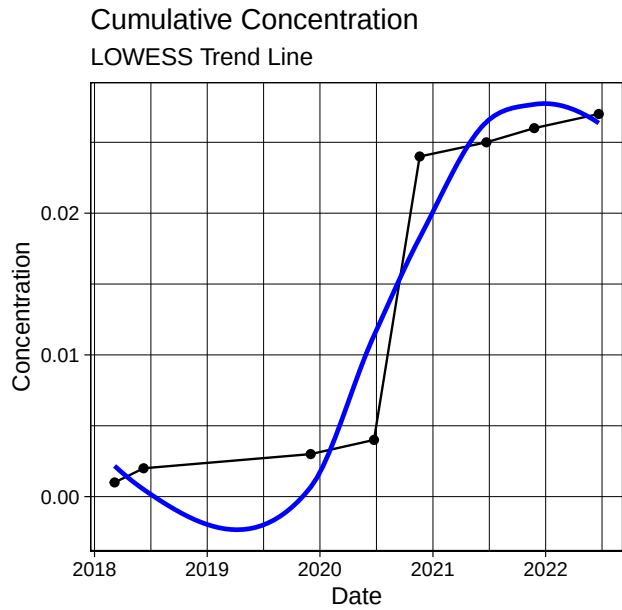
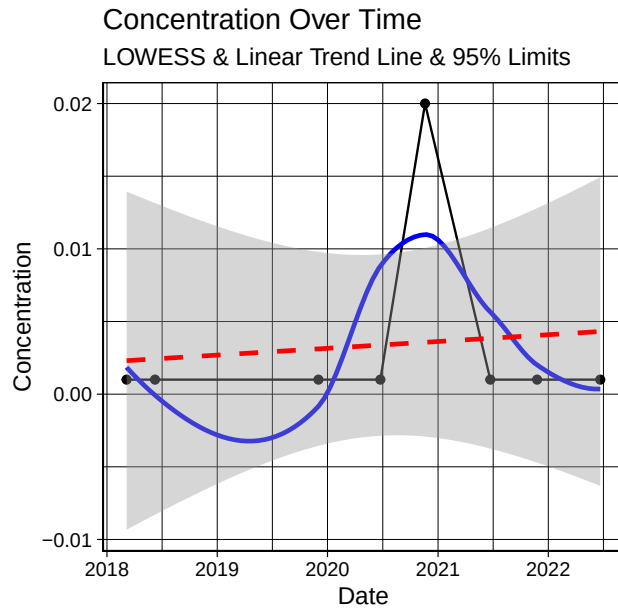
| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 7              |
| z                                     | 1.2            |
| p                                     | 0.23           |
| S                                     | 9              |
| varS                                  | 44.33          |
| tau                                   | 0.43           |
| mean                                  | 0.92           |
| sd                                    | 0.43           |
| cov                                   | 0.46           |
| results                               | NO CLEAR TREND |

Report for ID : MW021 and Analyte : SumofPFOSandPFHxS



| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 8              |
| z                                     | 0              |
| p                                     | 1              |
| S                                     | 1              |
| varS                                  | 21             |
| tau                                   | 0.07           |
| mean                                  | 0              |
| sd                                    | 0.01           |
| cov                                   | 1.99           |
| results                               | NO CLEAR TREND |

Report for ID : MW102 and Analyte : SumofPFOSandPFHxS

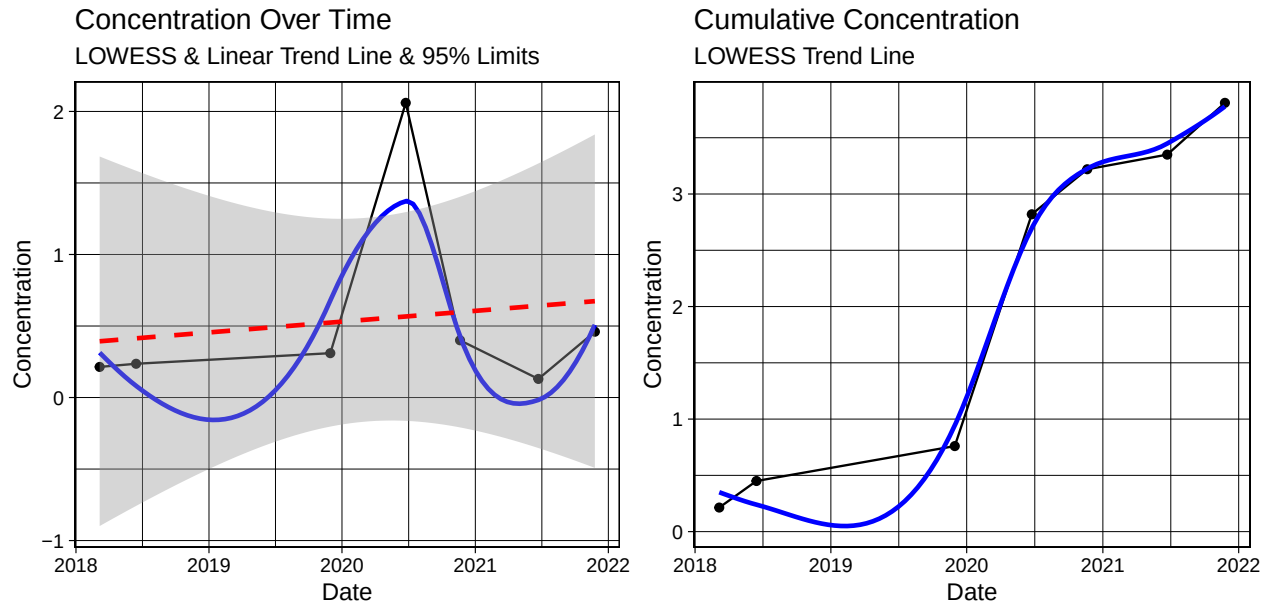


| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 7              |
| z                                     | 0.9            |
| p                                     | 0.37           |
| S                                     | 7              |
| varS                                  | 44.33          |
| tau                                   | 0.33           |
| mean                                  | 0.54           |
| sd                                    | 0.68           |
| cov                                   | 1.25           |
| results                               | NO CLEAR TREND |

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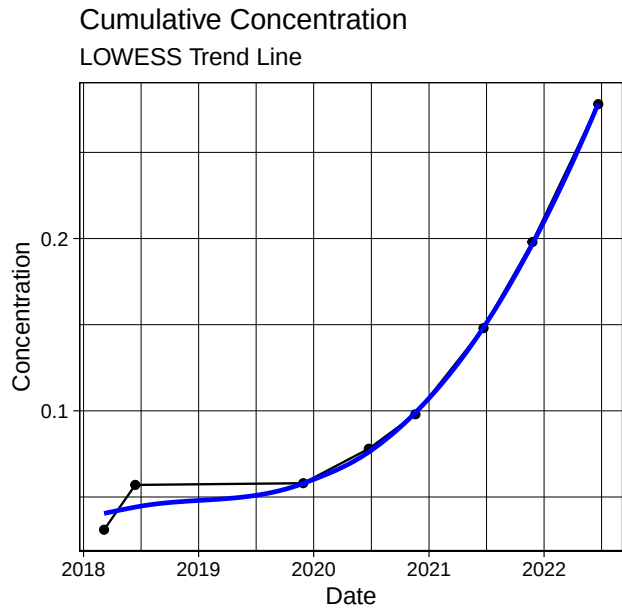
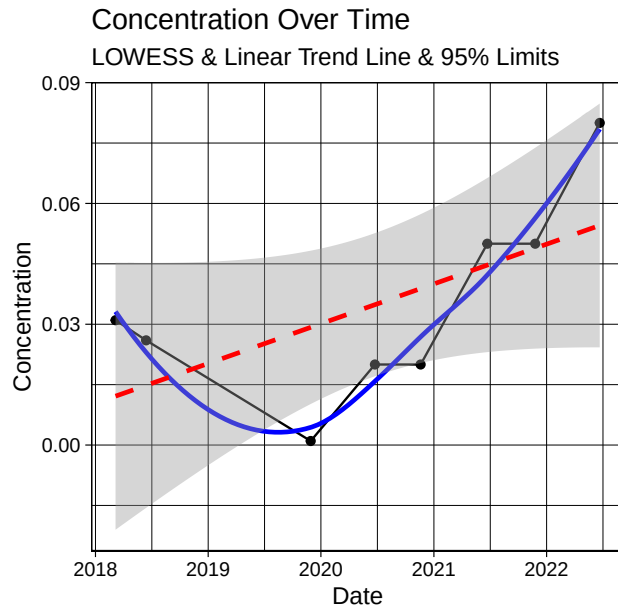
Report for ID : MW103 and Analyte : SumofPFOSandPFHxS

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| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 8              |
| z                                     | 1.38           |
| p                                     | 0.17           |
| S                                     | 12             |
| varS                                  | 63.33          |
| tau                                   | 0.44           |
| mean                                  | 0.03           |
| sd                                    | 0.02           |
| cov                                   | 0.7            |
| results                               | NO CLEAR TREND |

Report for ID : MW104 and Analyte : SumofPFOSandPFHxS

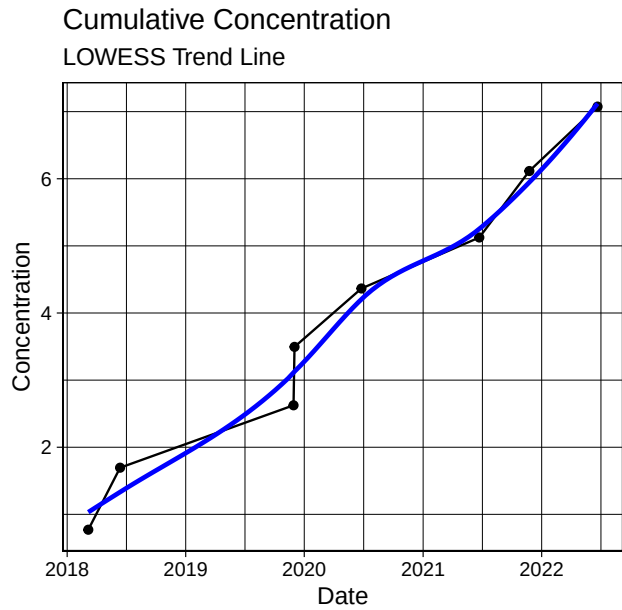
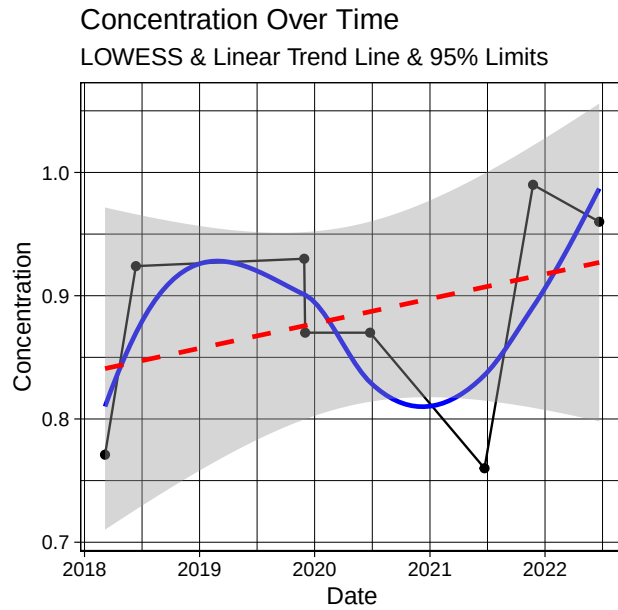


| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 8              |
| z                                     | 0.75           |
| p                                     | 0.45           |
| S                                     | 7              |
| varS                                  | 64.33          |
| tau                                   | 0.25           |
| mean                                  | 0.88           |
| sd                                    | 0.08           |
| cov                                   | 0.09           |
| results                               | NO CLEAR TREND |

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Report for ID : MW105 and Analyte : SumofPFOSandPFHxS

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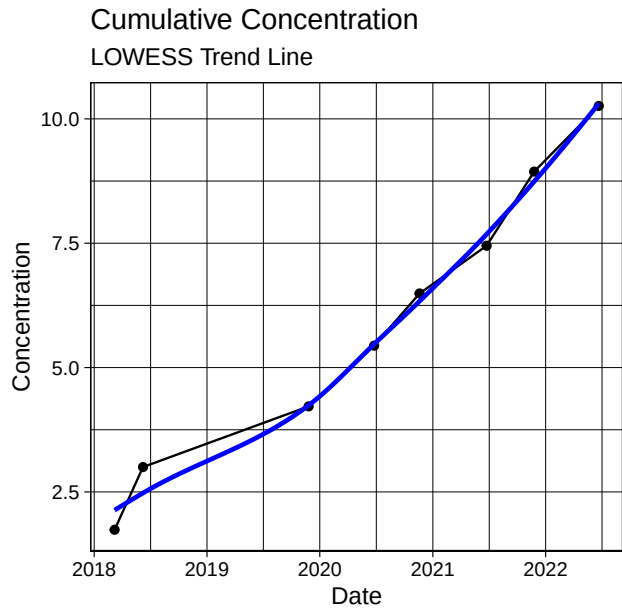
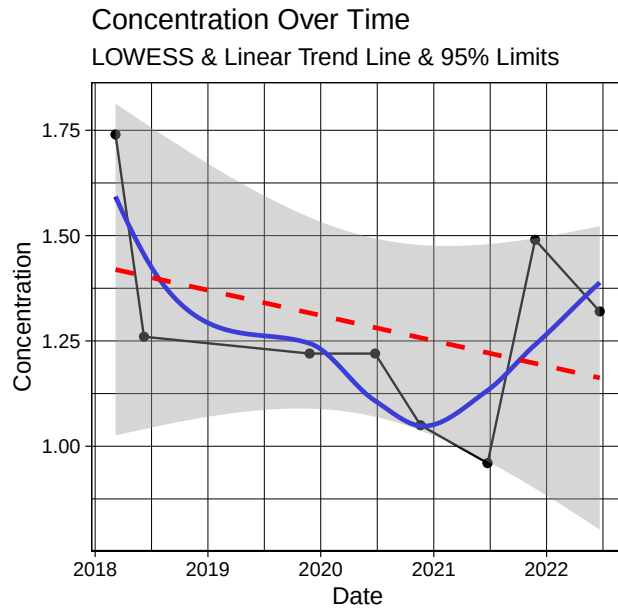


| Kendall Trend Test Results Continuous |        |
|---------------------------------------|--------|
| n                                     | 8      |
| z                                     | -0.75  |
| p                                     | 0.45   |
| S                                     | -7     |
| varS                                  | 64.33  |
| tau                                   | -0.25  |
| mean                                  | 1.28   |
| sd                                    | 0.24   |
| cov                                   | 0.19   |
| results                               | STABLE |

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Report for ID : MW112 and Analyte : SumofPFOSandPFHxS

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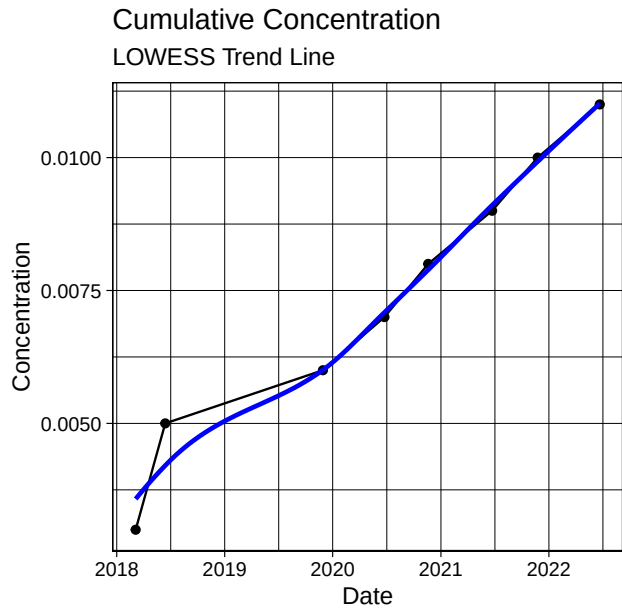
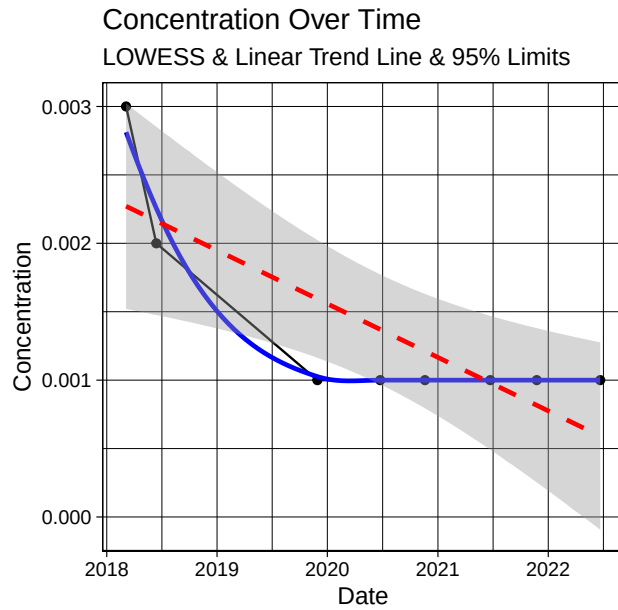


| Kendall Trend Test Results Continuous |            |
|---------------------------------------|------------|
| n                                     | 8          |
| z                                     | -1.97      |
| p                                     | 0.05       |
| S                                     | -13        |
| varS                                  | 37         |
| tau                                   | -0.68      |
| mean                                  | 0          |
| sd                                    | 0          |
| cov                                   | 0.54       |
| results                               | DECREASING |

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Report for ID : MW113 and Analyte : SumofPFOSandPFHxS

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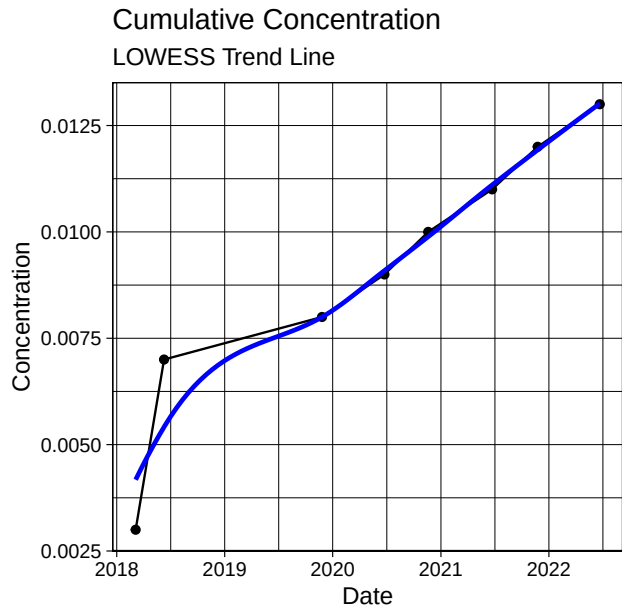
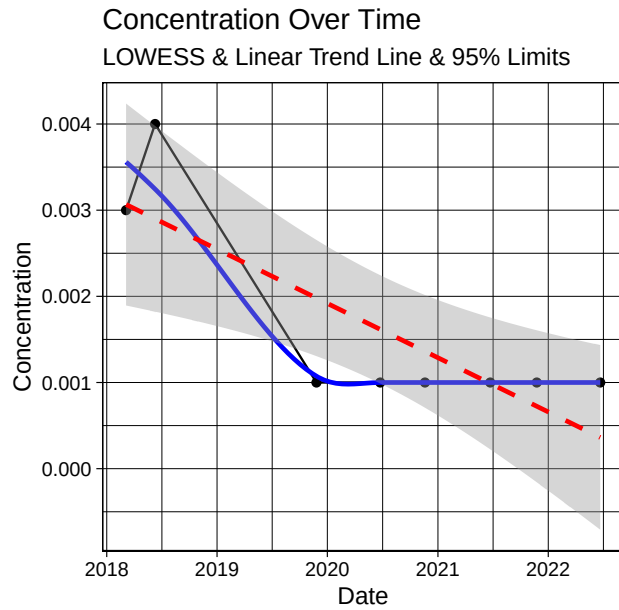


| Kendall Trend Test Results Continuous |        |
|---------------------------------------|--------|
| n                                     | 8      |
| z                                     | -1.64  |
| p                                     | 0.1    |
| S                                     | -11    |
| varS                                  | 37     |
| tau                                   | -0.58  |
| mean                                  | 0      |
| sd                                    | 0      |
| cov                                   | 0.73   |
| results                               | STABLE |

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Report for ID : MW114 and Analyte : SumofPFOSandPFHxS

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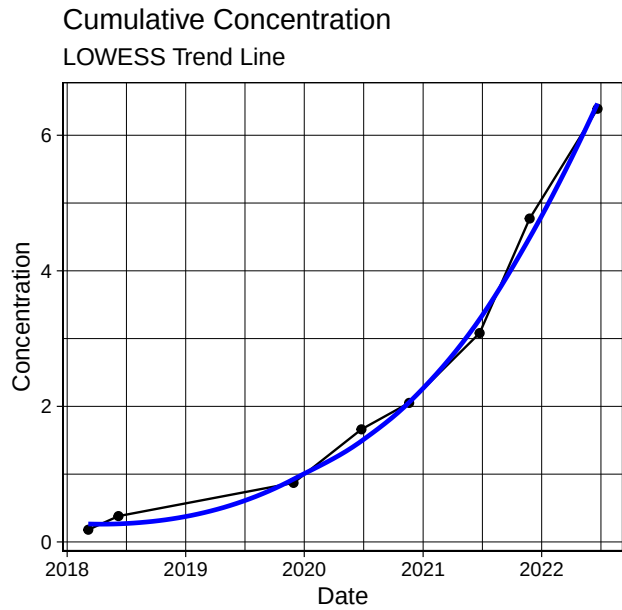
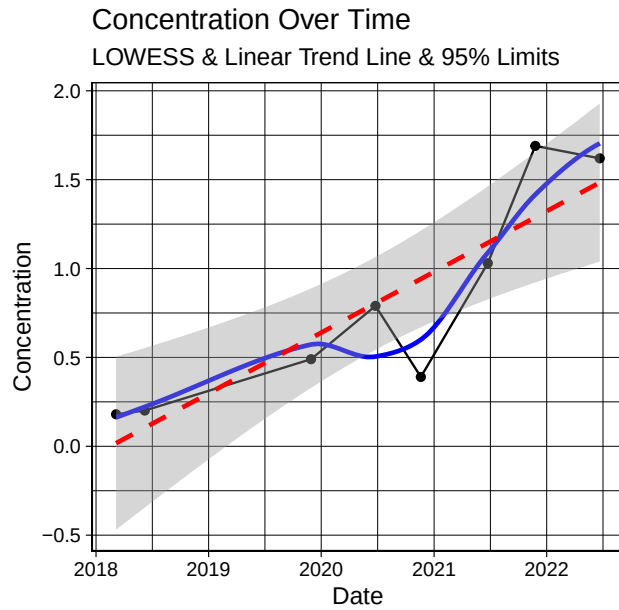


| Kendall Trend Test Results Continuous |            |
|---------------------------------------|------------|
| n                                     | 8          |
| z                                     | 2.6        |
| p                                     | 0.01       |
| S                                     | 22         |
| varS                                  | 65.33      |
| tau                                   | 0.79       |
| mean                                  | 0.8        |
| sd                                    | 0.6        |
| cov                                   | 0.75       |
| results                               | INCREASING |

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Report for ID : MW115 and Analyte : SumofPFOSandPFHxS

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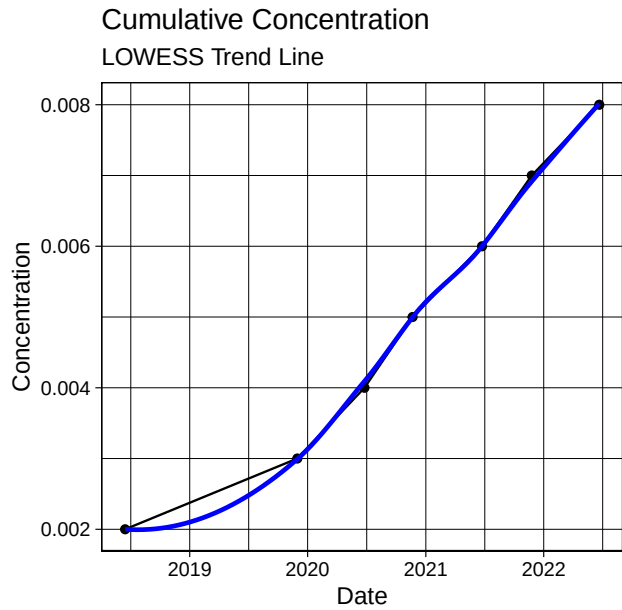
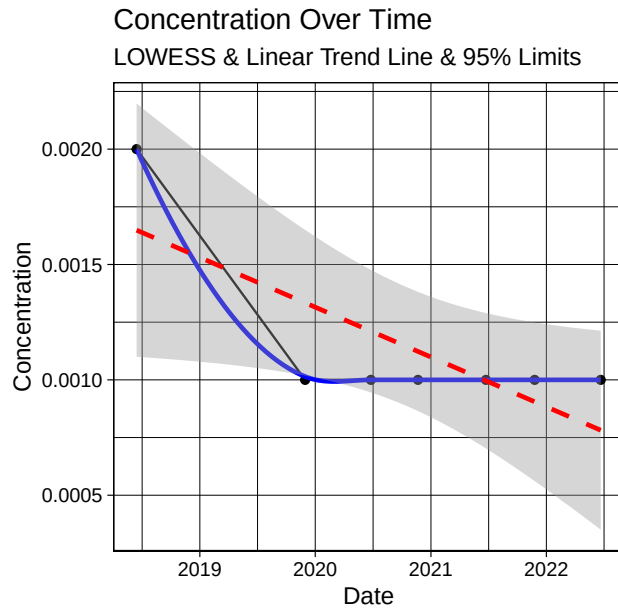


| Kendall Trend Test Results Continuous |        |
|---------------------------------------|--------|
| n                                     | 7      |
| z                                     | -1.25  |
| p                                     | 0.21   |
| S                                     | -6     |
| varS                                  | 16     |
| tau                                   | -0.53  |
| mean                                  | 0      |
| sd                                    | 0      |
| cov                                   | 0.33   |
| results                               | STABLE |

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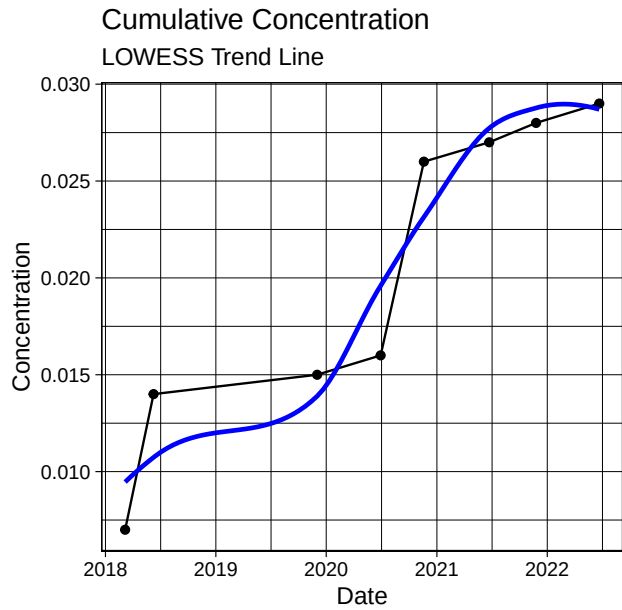
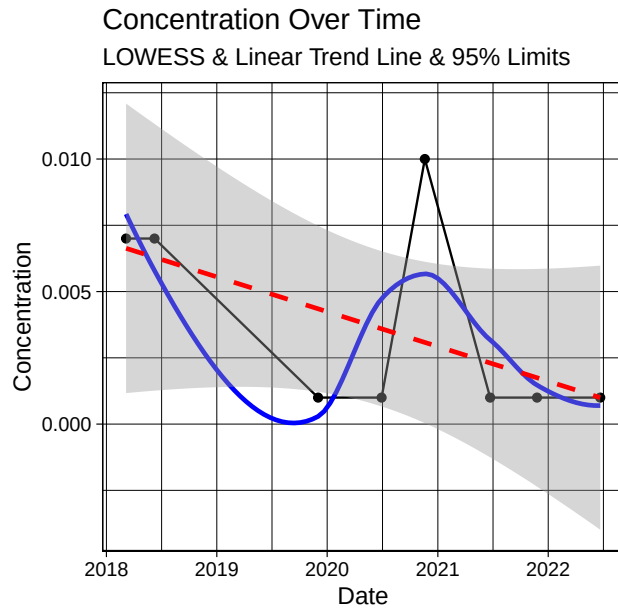
Report for ID : MW122 and Analyte : SumofPFOSandPFHxS

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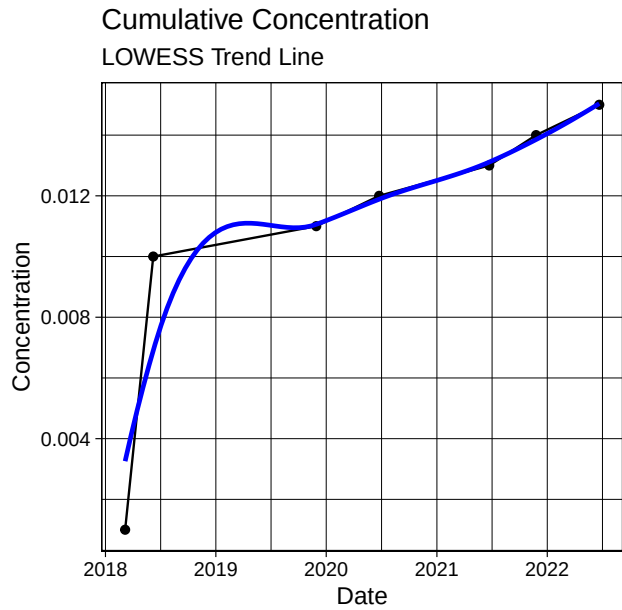
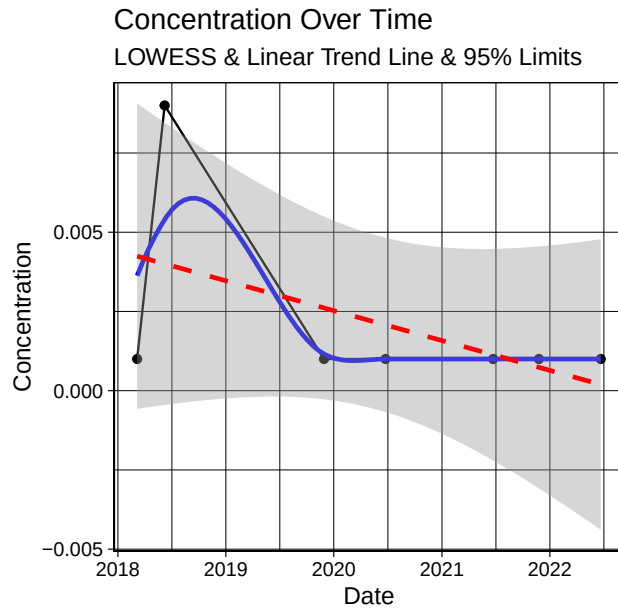
| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 8              |
| z                                     | -1.16          |
| p                                     | 0.25           |
| S                                     | -9             |
| varS                                  | 47.67          |
| tau                                   | -0.41          |
| mean                                  | 0              |
| sd                                    | 0              |
| cov                                   | 1.03           |
| results                               | NO CLEAR TREND |

Report for ID : MW124 and Analyte : SumofPFOSandPFHxS



| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 7              |
| z                                     | -0.75          |
| p                                     | 0.45           |
| S                                     | -4             |
| varS                                  | 16             |
| tau                                   | -0.36          |
| mean                                  | 0              |
| sd                                    | 0              |
| cov                                   | 1.41           |
| results                               | NO CLEAR TREND |

Report for ID : MW126 and Analyte : SumofPFOSandPFHxS



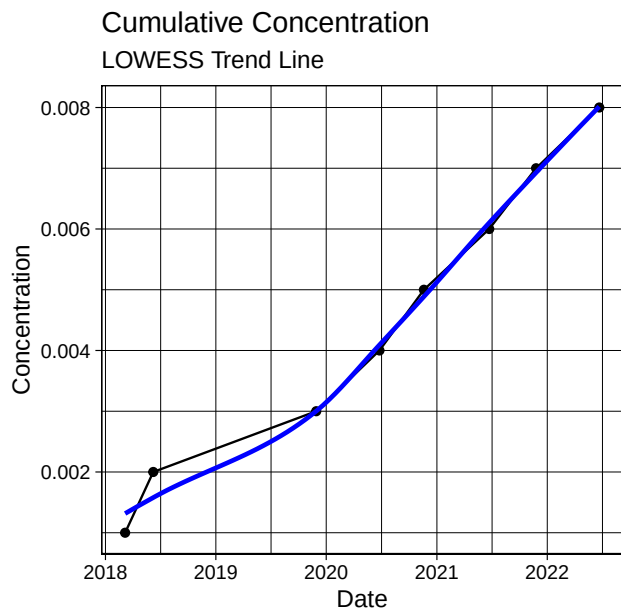
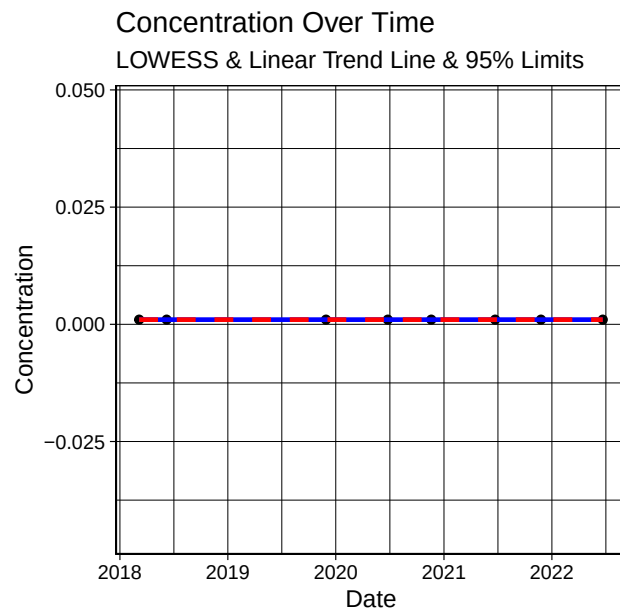


| Kendall Trend Test Results Continuous |     |
|---------------------------------------|-----|
| n                                     | 8   |
| z                                     | NaN |
| p                                     | NaN |
| S                                     | 0   |
| varS                                  | 0   |
| tau                                   | NaN |
| mean                                  | 0   |
| sd                                    | 0   |
| cov                                   | 0   |
| results                               | NA  |

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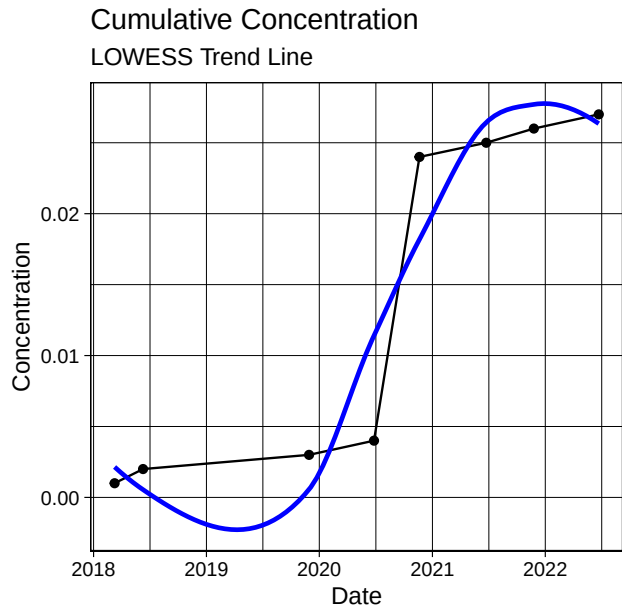
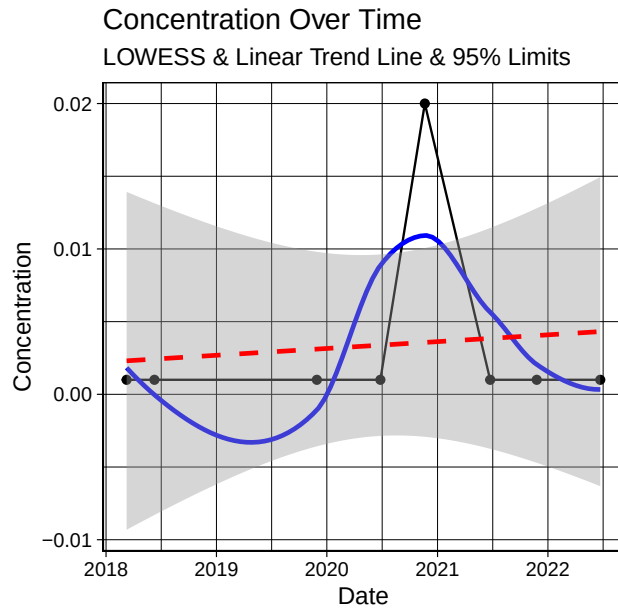
Report for ID : MW127 and Analyte : SumofPFOSandPFHxS

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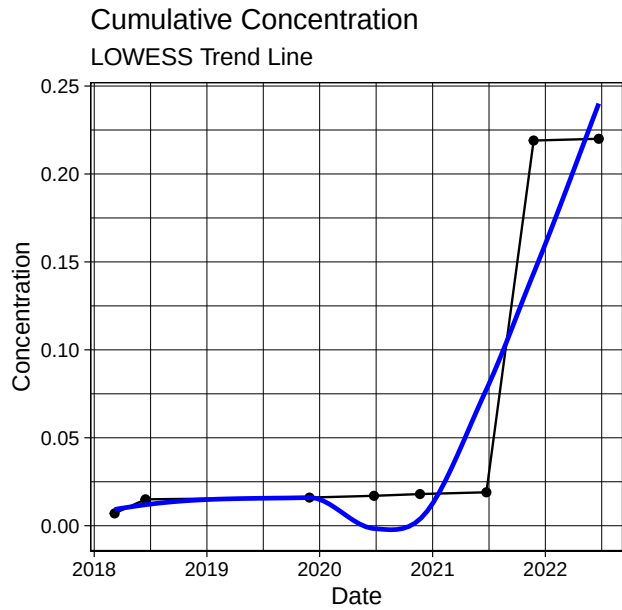
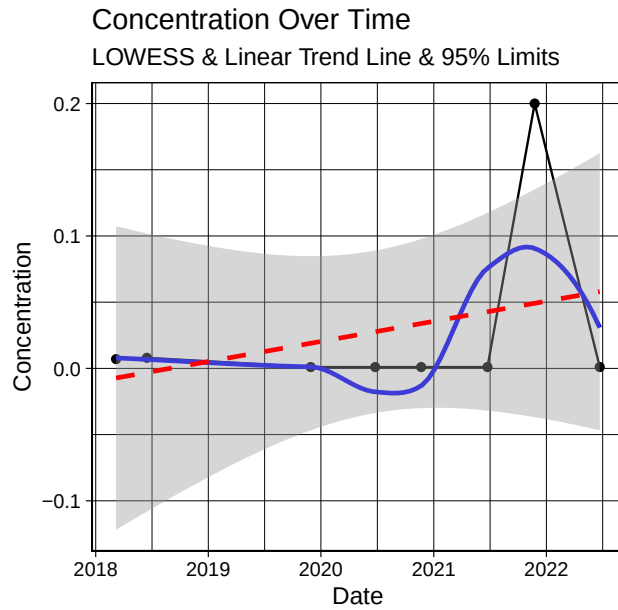
| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 8              |
| z                                     | 0              |
| p                                     | 1              |
| S                                     | 1              |
| varS                                  | 21             |
| tau                                   | 0.07           |
| mean                                  | 0              |
| sd                                    | 0.01           |
| cov                                   | 1.99           |
| results                               | NO CLEAR TREND |

Report for ID : MW134 and Analyte : SumofPFOSandPFHxS



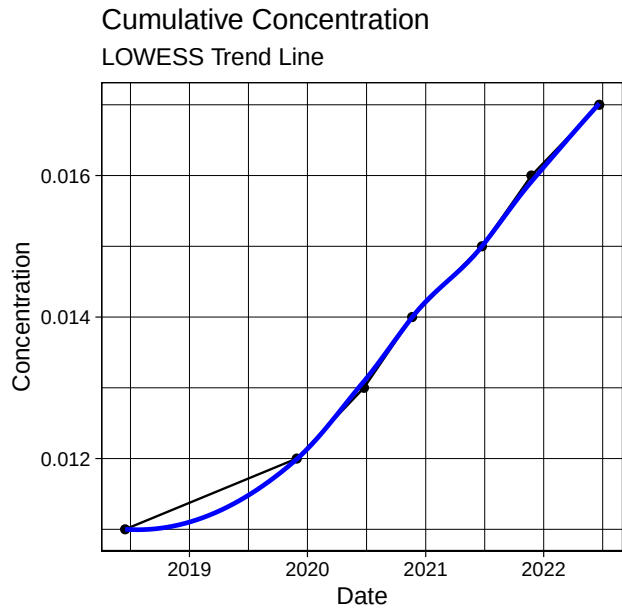
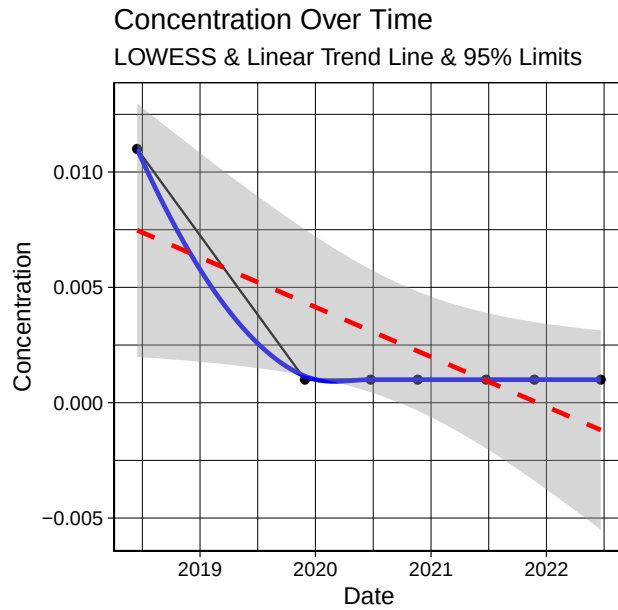
| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 8              |
| z                                     | -0.43          |
| p                                     | 0.67           |
| S                                     | -4             |
| varS                                  | 48.67          |
| tau                                   | -0.18          |
| mean                                  | 0.03           |
| sd                                    | 0.07           |
| cov                                   | 2.54           |
| results                               | NO CLEAR TREND |

Report for ID : MW135 and Analyte : SumofPFOSandPFHxS



| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 7              |
| z                                     | -1.25          |
| p                                     | 0.21           |
| S                                     | -6             |
| varS                                  | 16             |
| tau                                   | -0.53          |
| mean                                  | 0              |
| sd                                    | 0              |
| cov                                   | 1.56           |
| results                               | NO CLEAR TREND |

Report for ID : MW137 and Analyte : SumofPFOSandPFHxS

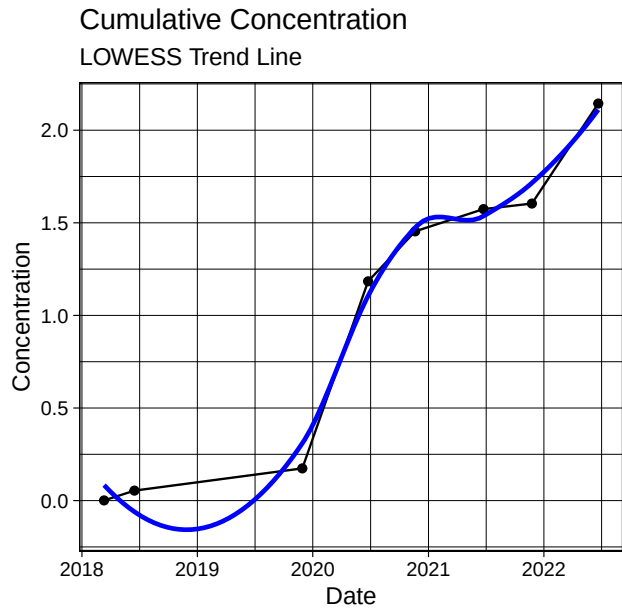
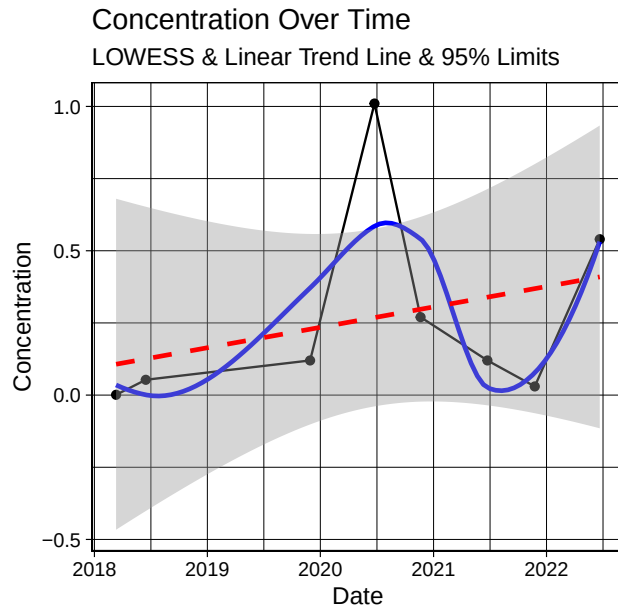


| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 8              |
| z                                     | 1              |
| p                                     | 0.32           |
| S                                     | 9              |
| varS                                  | 64.33          |
| tau                                   | 0.33           |
| mean                                  | 0.27           |
| sd                                    | 0.35           |
| cov                                   | 1.29           |
| results                               | NO CLEAR TREND |

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Report for ID : MW138 and Analyte : SumofPFOSandPFHxS

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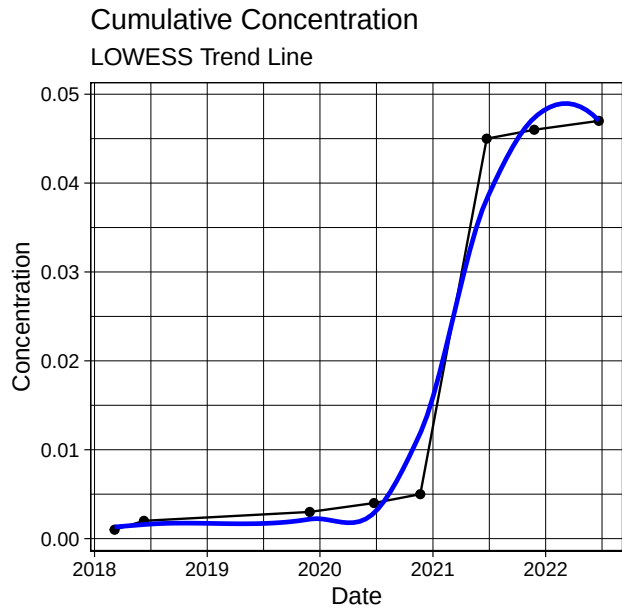
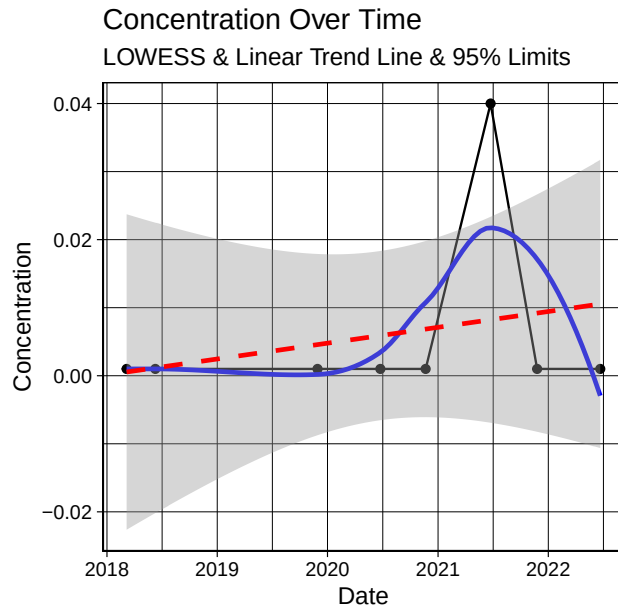


| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 8              |
| z                                     | 0.44           |
| p                                     | 0.66           |
| S                                     | 3              |
| varS                                  | 21             |
| tau                                   | 0.21           |
| mean                                  | 0.01           |
| sd                                    | 0.01           |
| cov                                   | 2.35           |
| results                               | NO CLEAR TREND |

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Report for ID : MW139 and Analyte : SumofPFOSandPFHxS

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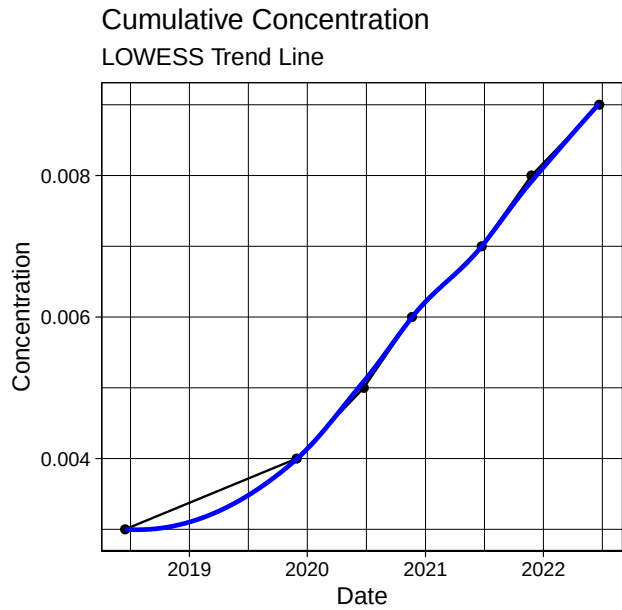
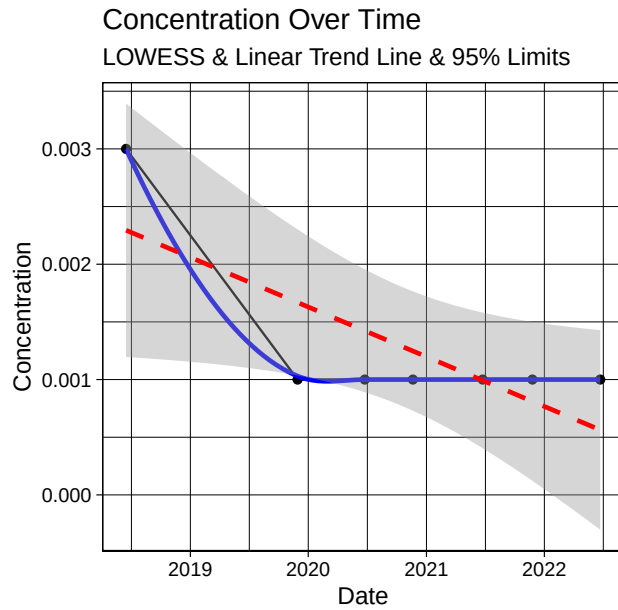


| Kendall Trend Test Results Continuous |        |
|---------------------------------------|--------|
| n                                     | 7      |
| z                                     | -1.25  |
| p                                     | 0.21   |
| S                                     | -6     |
| varS                                  | 16     |
| tau                                   | -0.53  |
| mean                                  | 0      |
| sd                                    | 0      |
| cov                                   | 0.59   |
| results                               | STABLE |

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Report for ID : MW140 and Analyte : SumofPFOSandPFHxS

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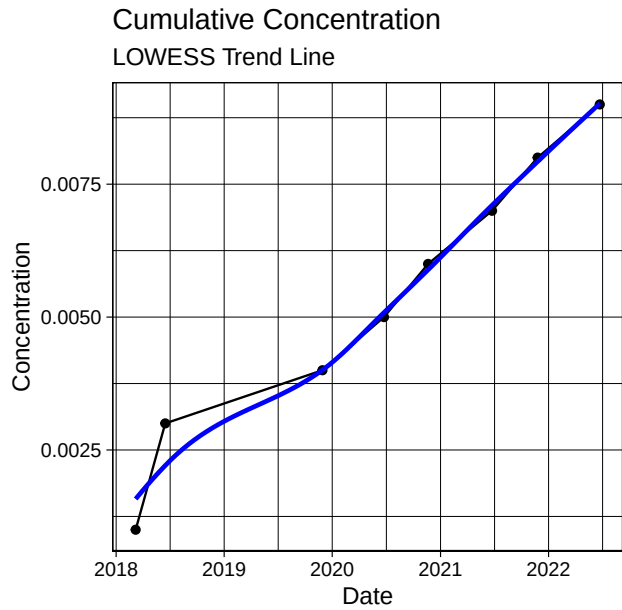
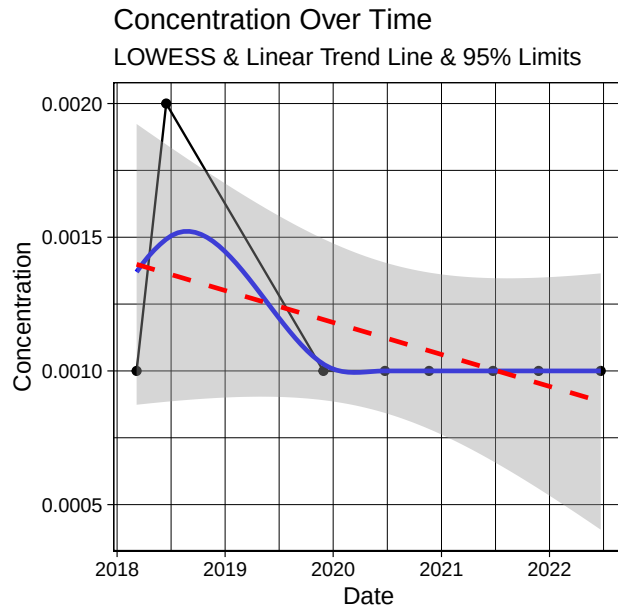


| Kendall Trend Test Results Continuous |        |
|---------------------------------------|--------|
| n                                     | 8      |
| z                                     | -0.87  |
| p                                     | 0.38   |
| S                                     | -5     |
| varS                                  | 21     |
| tau                                   | -0.36  |
| mean                                  | 0      |
| sd                                    | 0      |
| cov                                   | 0.31   |
| results                               | STABLE |

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Report for ID : MW141 and Analyte : SumofPFOSandPFHxS

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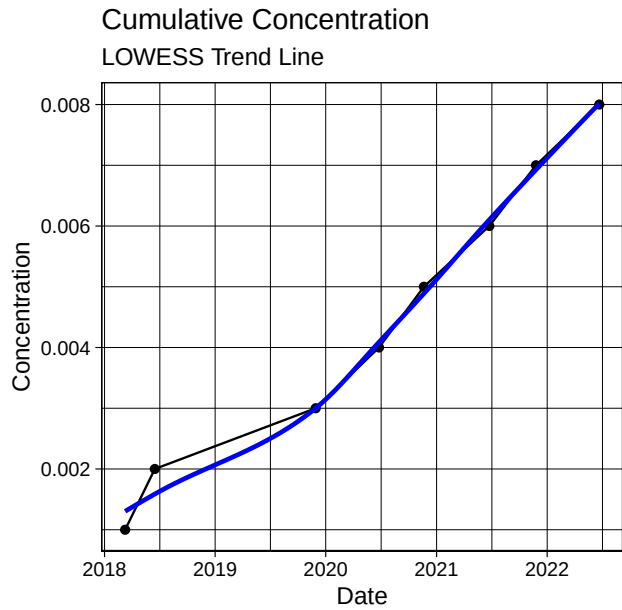
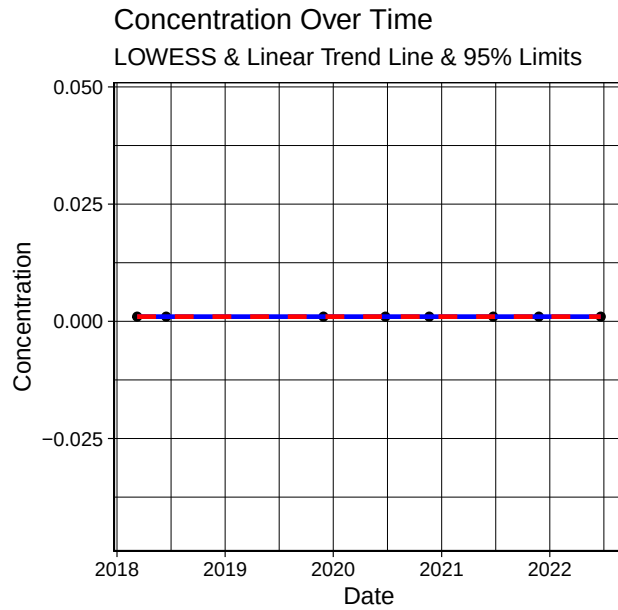


| Kendall Trend Test Results Continuous |     |
|---------------------------------------|-----|
| n                                     | 8   |
| z                                     | NaN |
| p                                     | NaN |
| S                                     | 0   |
| varS                                  | 0   |
| tau                                   | NaN |
| mean                                  | 0   |
| sd                                    | 0   |
| cov                                   | 0   |
| results                               | NA  |

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Report for ID : MW143 and Analyte : SumofPFOSandPFHxS

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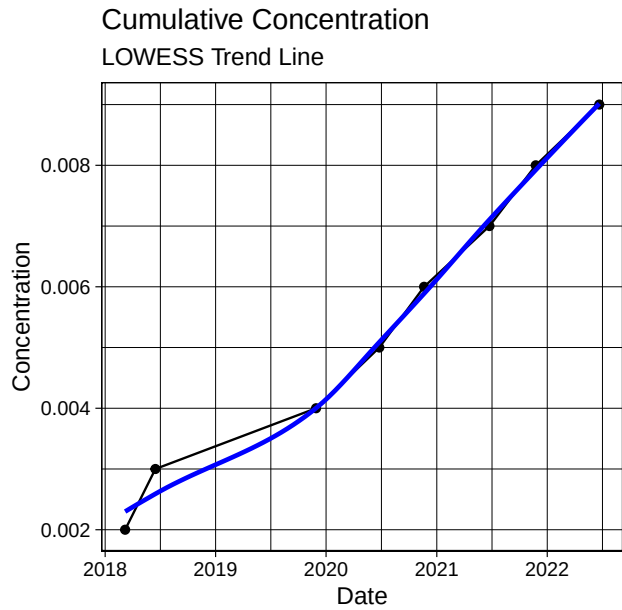
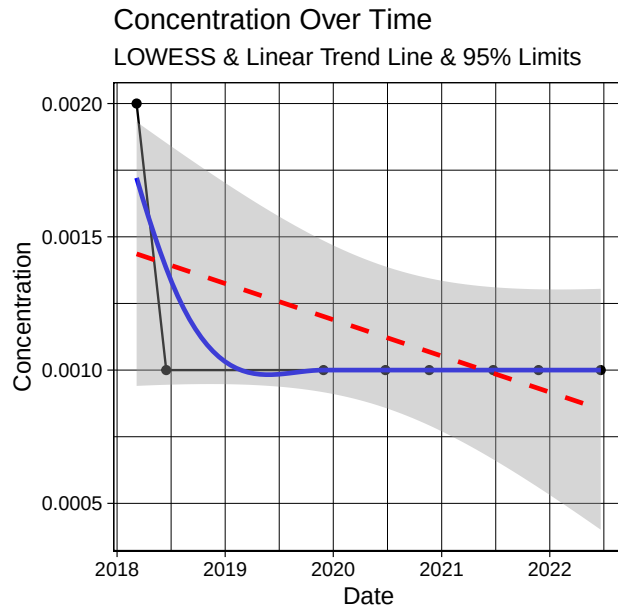


| Kendall Trend Test Results Continuous |        |
|---------------------------------------|--------|
| n                                     | 8      |
| z                                     | -1.31  |
| p                                     | 0.19   |
| S                                     | -7     |
| varS                                  | 21     |
| tau                                   | -0.5   |
| mean                                  | 0      |
| sd                                    | 0      |
| cov                                   | 0.31   |
| results                               | STABLE |

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Report for ID : MW144 and Analyte : SumofPFOSandPFHxS

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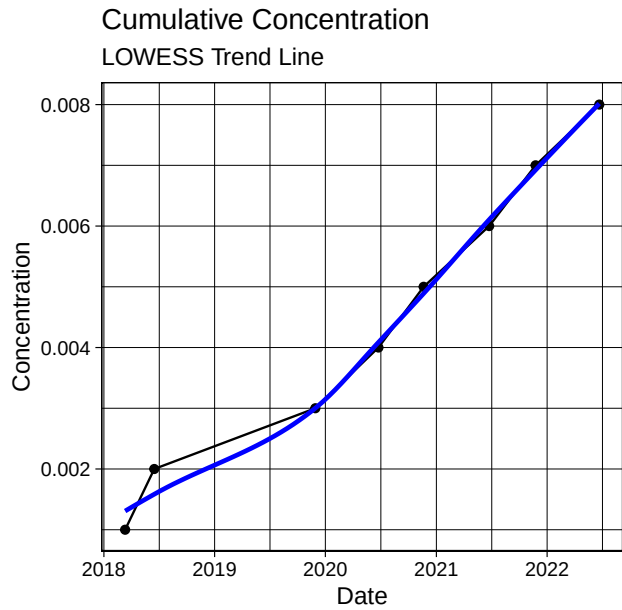
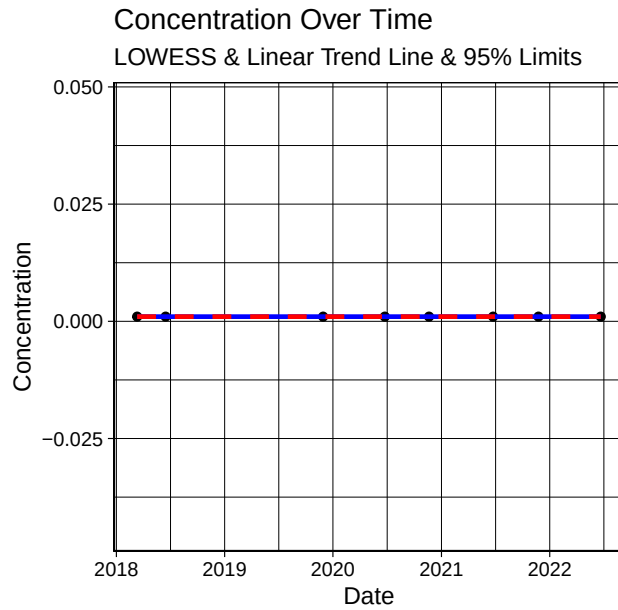


| Kendall Trend Test Results Continuous |     |
|---------------------------------------|-----|
| n                                     | 8   |
| z                                     | NaN |
| p                                     | NaN |
| S                                     | 0   |
| varS                                  | 0   |
| tau                                   | NaN |
| mean                                  | 0   |
| sd                                    | 0   |
| cov                                   | 0   |
| results                               | NA  |

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Report for ID : MW145 and Analyte : SumofPFOSandPFHxS

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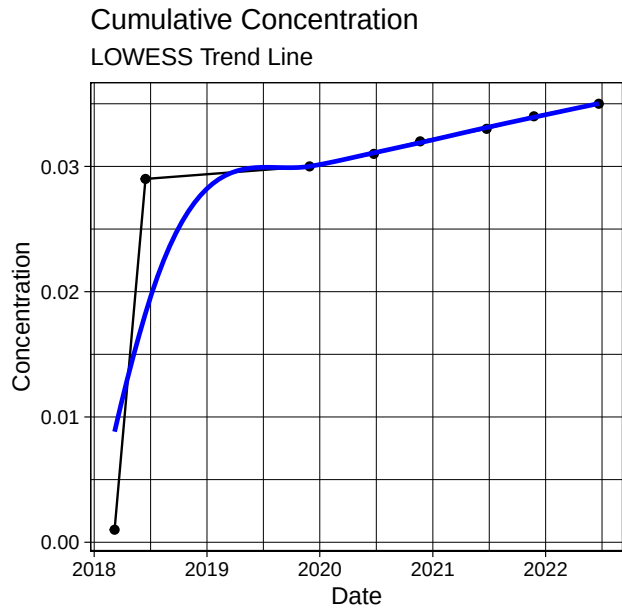
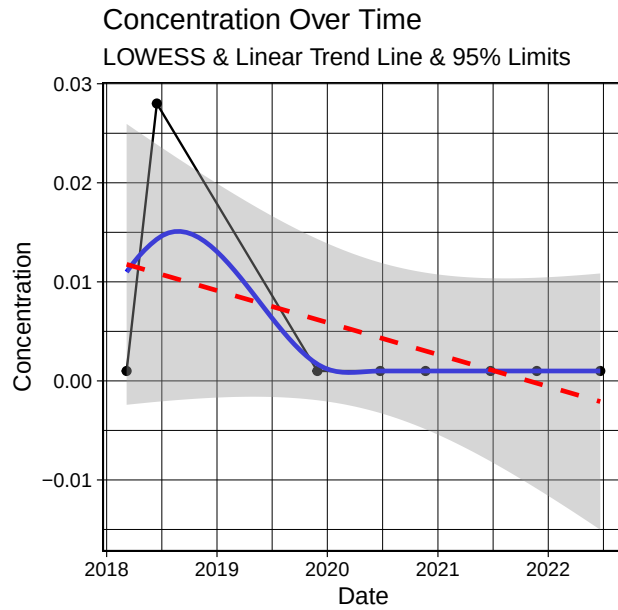


| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 8              |
| z                                     | -0.87          |
| p                                     | 0.38           |
| S                                     | -5             |
| varS                                  | 21             |
| tau                                   | -0.36          |
| mean                                  | 0              |
| sd                                    | 0.01           |
| cov                                   | 2.18           |
| results                               | NO CLEAR TREND |

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Report for ID : MW146 and Analyte : SumofPFOSandPFHxS

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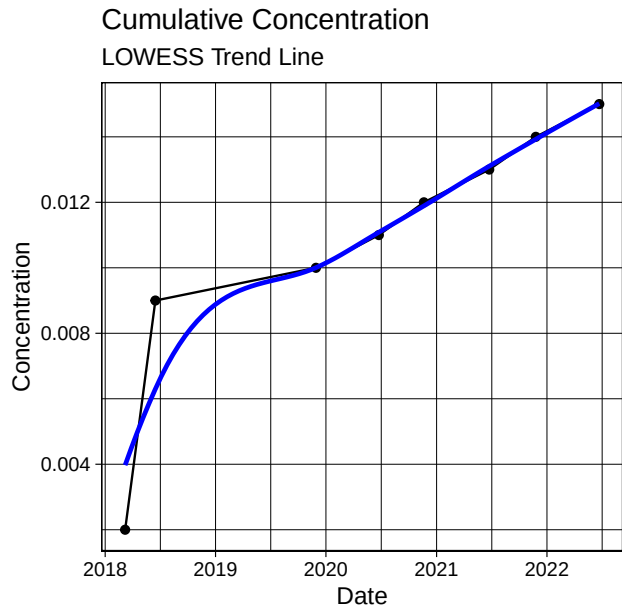
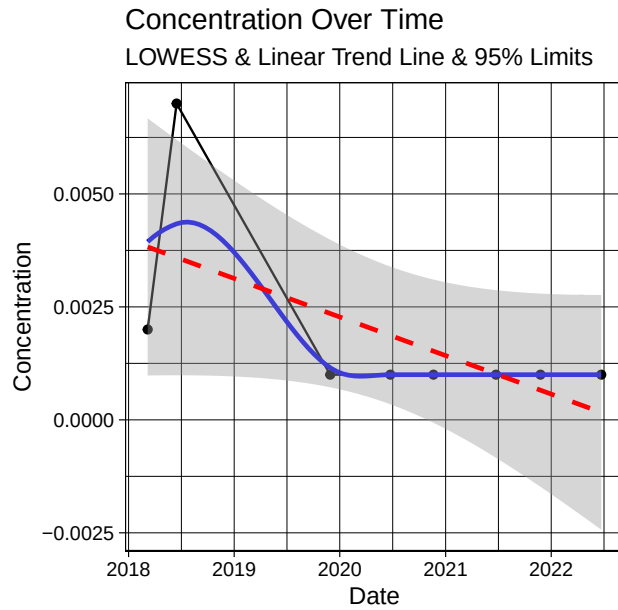


| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 8              |
| z                                     | -1.64          |
| p                                     | 0.1            |
| S                                     | -11            |
| varS                                  | 37             |
| tau                                   | -0.58          |
| mean                                  | 0              |
| sd                                    | 0              |
| cov                                   | 1.12           |
| results                               | NO CLEAR TREND |

---

Report for ID : MW147 and Analyte : SumofPFOSandPFHxS

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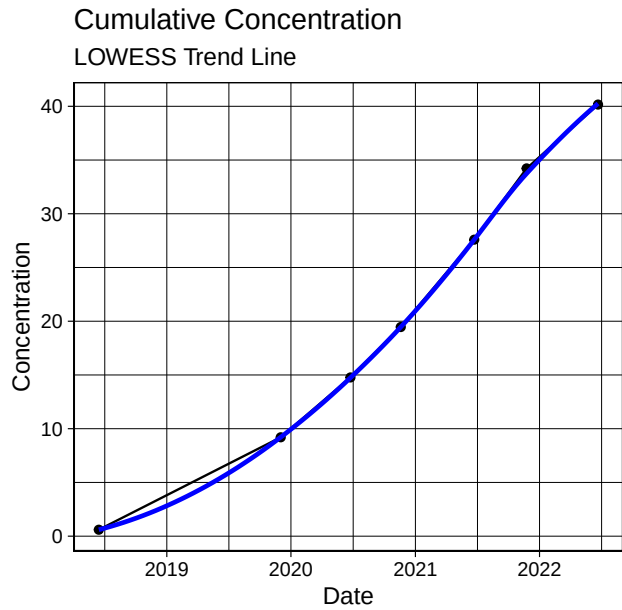
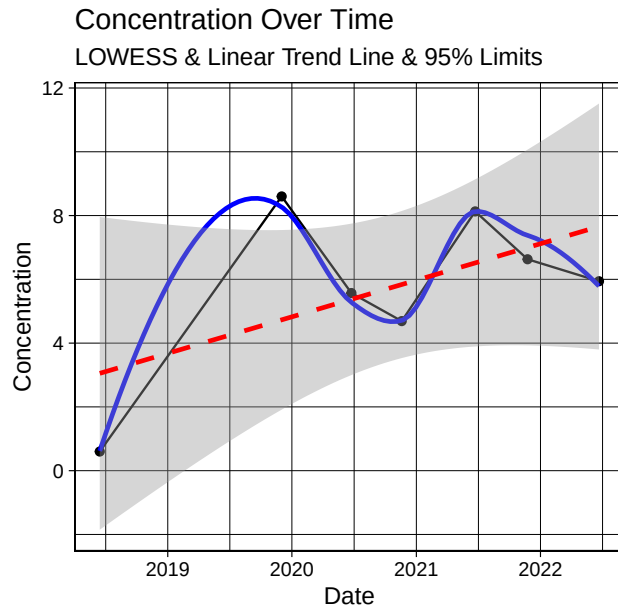


| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 7              |
| z                                     | 0.3            |
| p                                     | 0.76           |
| S                                     | 3              |
| varS                                  | 44.33          |
| tau                                   | 0.14           |
| mean                                  | 5.74           |
| sd                                    | 2.65           |
| cov                                   | 0.46           |
| results                               | NO CLEAR TREND |

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Report for ID : MW148D and Analyte : SumofPFOSandPFHxS

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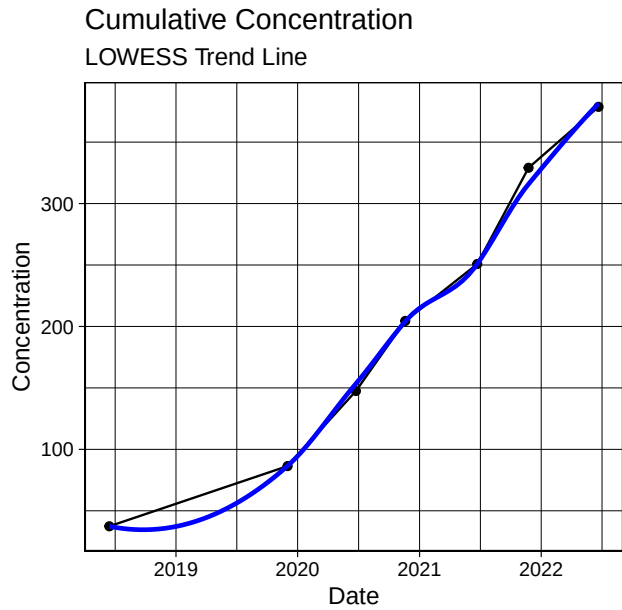
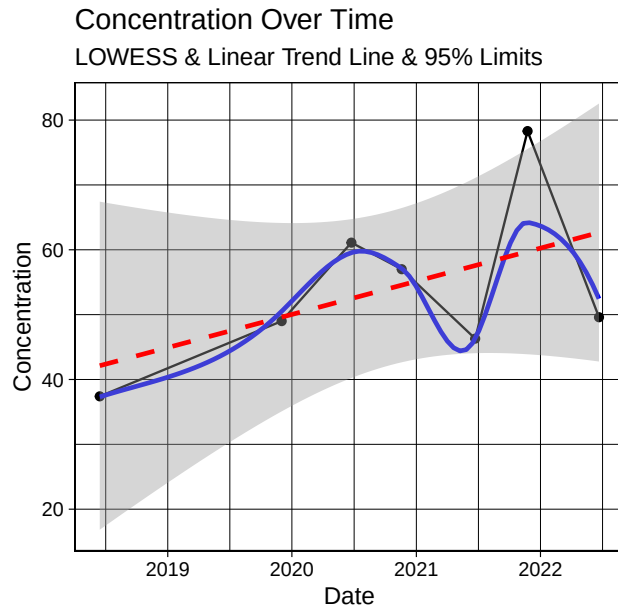


| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 7              |
| z                                     | 0.9            |
| p                                     | 0.37           |
| S                                     | 7              |
| varS                                  | 44.33          |
| tau                                   | 0.33           |
| mean                                  | 54.1           |
| sd                                    | 13.1           |
| cov                                   | 0.24           |
| results                               | NO CLEAR TREND |

---

Report for ID : MW148S and Analyte : SumofPFOSandPFHxS

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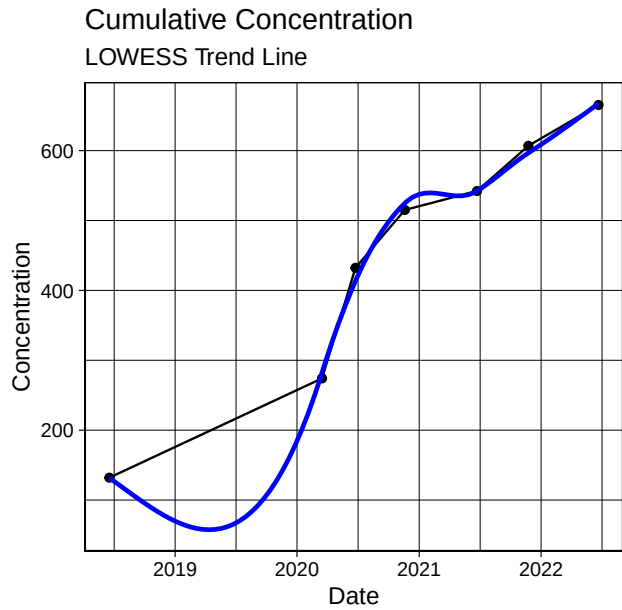
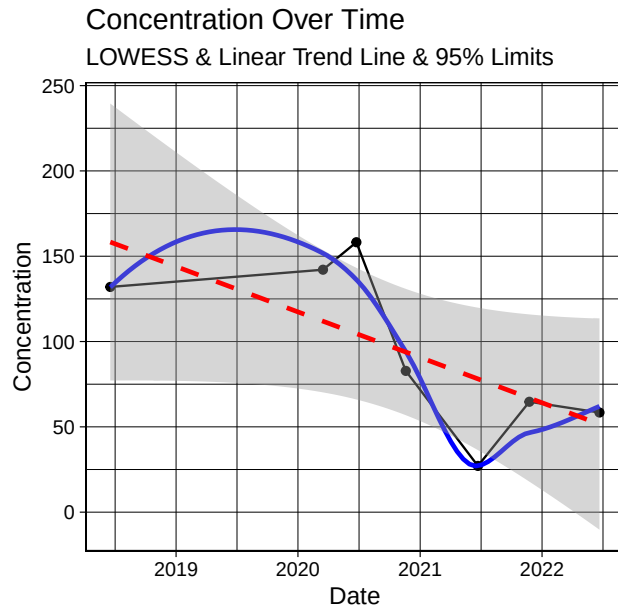


| Kendall Trend Test Results Continuous |        |
|---------------------------------------|--------|
| n                                     | 7      |
| z                                     | -1.5   |
| p                                     | 0.13   |
| S                                     | -11    |
| varS                                  | 44.33  |
| tau                                   | -0.52  |
| mean                                  | 95.04  |
| sd                                    | 49.33  |
| cov                                   | 0.52   |
| results                               | STABLE |

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Report for ID : MW151 and Analyte : SumofPFOSandPFHxS

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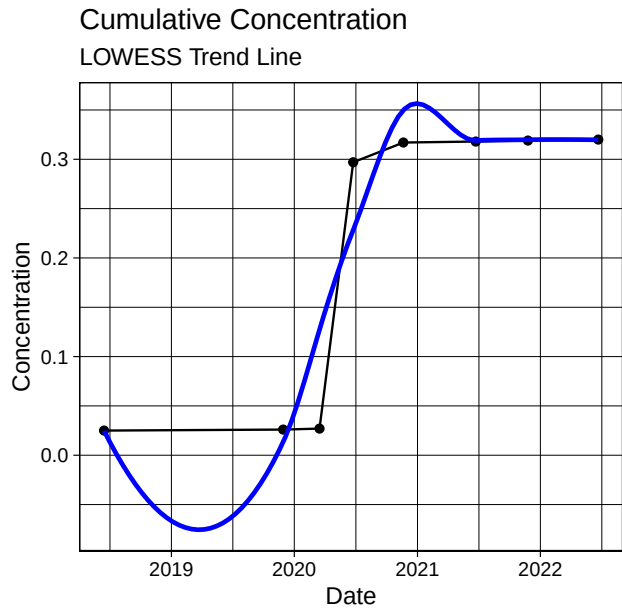
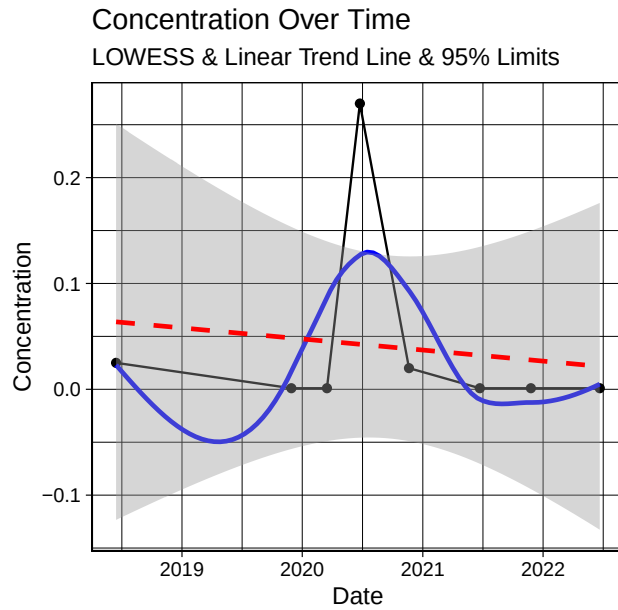


| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 8              |
| z                                     | -1             |
| p                                     | 0.32           |
| S                                     | -8             |
| varS                                  | 48.67          |
| tau                                   | -0.36          |
| mean                                  | 0.04           |
| sd                                    | 0.09           |
| cov                                   | 2.34           |
| results                               | NO CLEAR TREND |

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Report for ID : MW159 and Analyte : SumofPFOSandPFHxS

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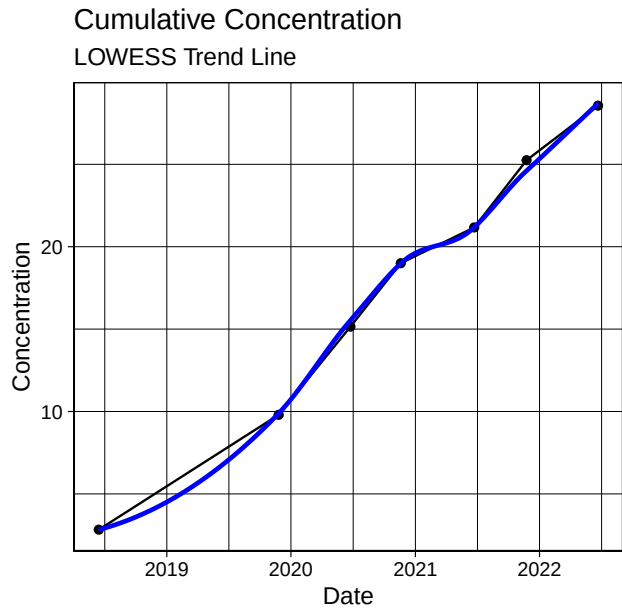
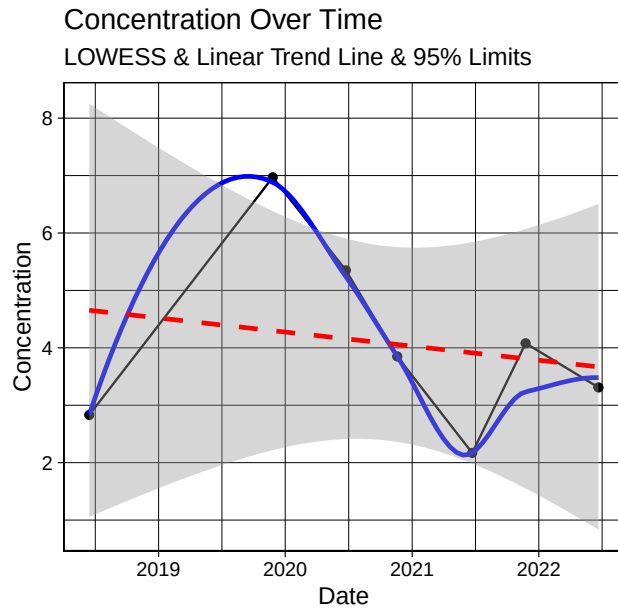


| Kendall Trend Test Results Continuous |        |
|---------------------------------------|--------|
| n                                     | 7      |
| z                                     | -0.6   |
| p                                     | 0.55   |
| S                                     | -5     |
| varS                                  | 44.33  |
| tau                                   | -0.24  |
| mean                                  | 4.08   |
| sd                                    | 1.62   |
| cov                                   | 0.4    |
| results                               | STABLE |

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Report for ID : MW162 and Analyte : SumofPFOSandPFHxS

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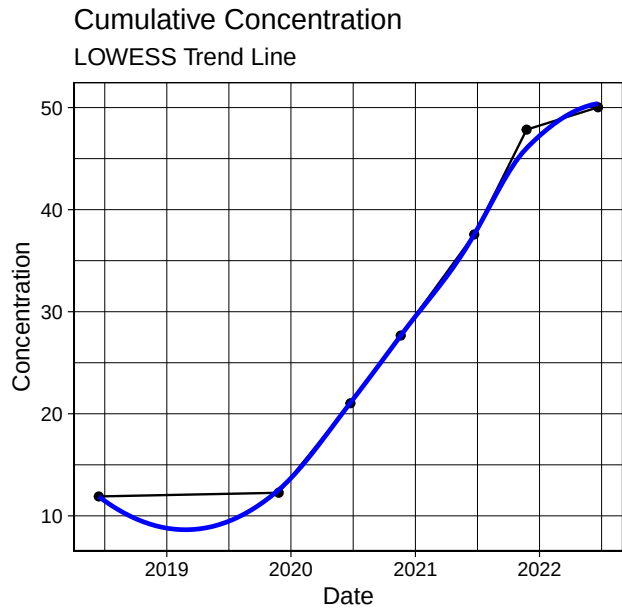
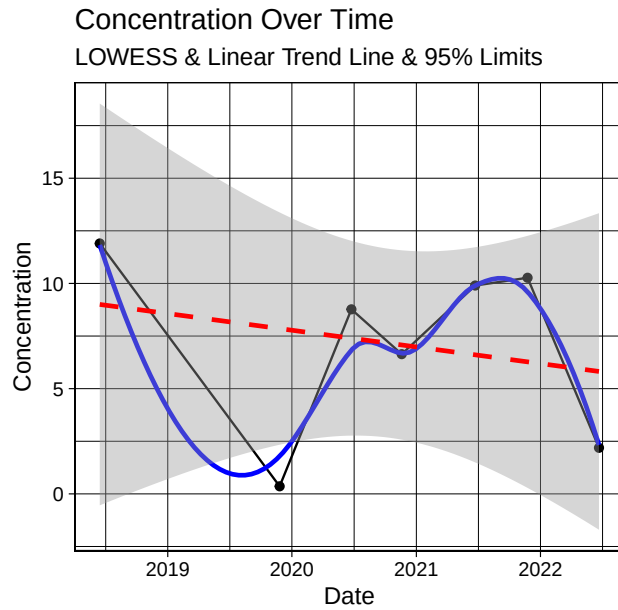


| Kendall Trend Test Results Continuous |        |
|---------------------------------------|--------|
| n                                     | 7      |
| z                                     | 0      |
| p                                     | 1      |
| S                                     | -1     |
| varS                                  | 44.33  |
| tau                                   | -0.05  |
| mean                                  | 7.15   |
| sd                                    | 4.35   |
| cov                                   | 0.61   |
| results                               | STABLE |

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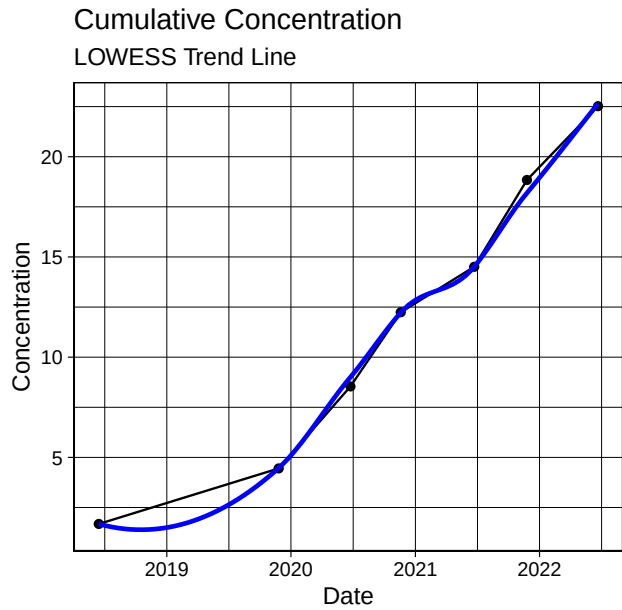
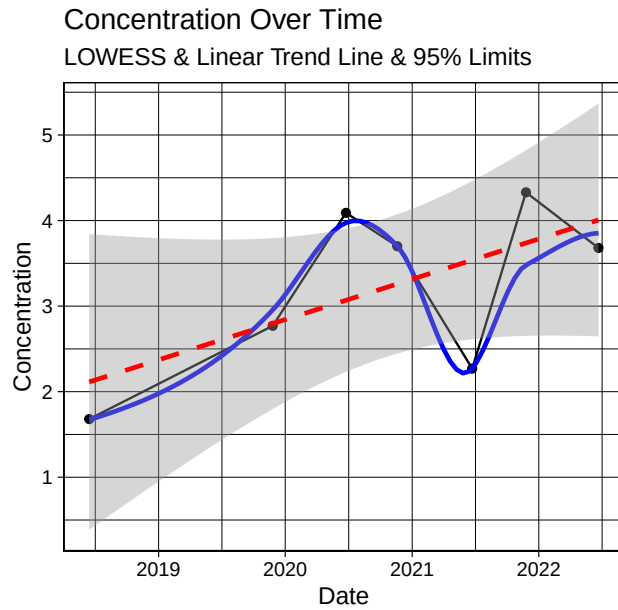
Report for ID : MW163 and Analyte : SumofPFOSandPFHxS

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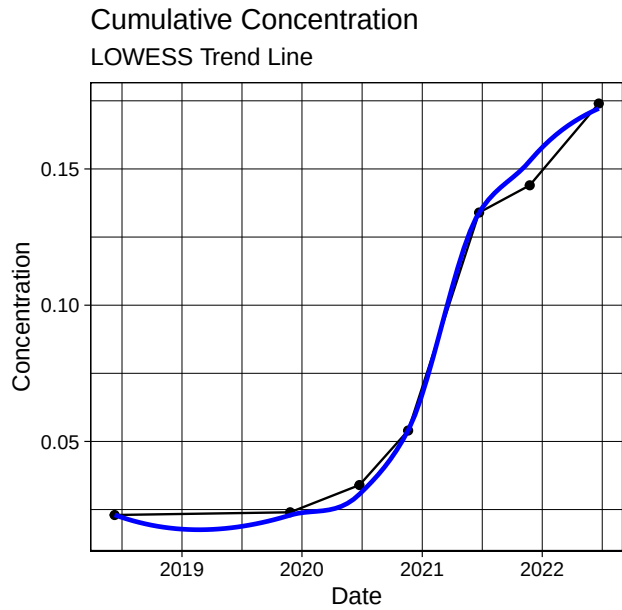
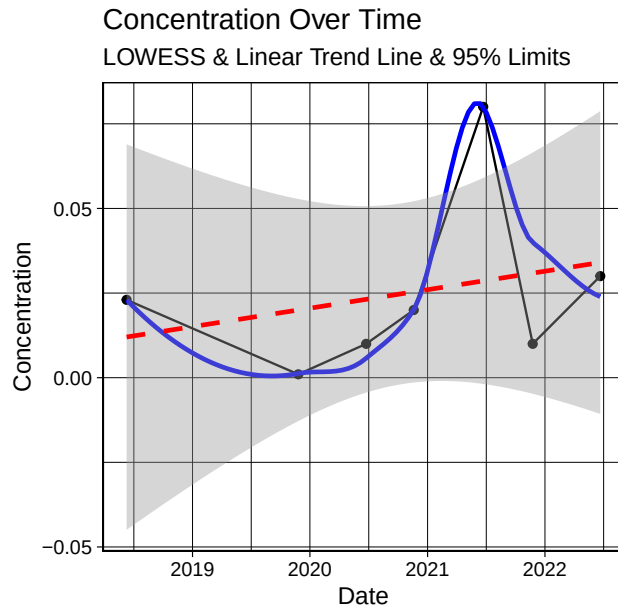
| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 7              |
| z                                     | 0.9            |
| p                                     | 0.37           |
| S                                     | 7              |
| varS                                  | 44.33          |
| tau                                   | 0.33           |
| mean                                  | 3.22           |
| sd                                    | 0.99           |
| cov                                   | 0.31           |
| results                               | NO CLEAR TREND |

Report for ID : MW164 and Analyte : SumofPFOSandPFHxS



| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 7              |
| z                                     | 0.76           |
| p                                     | 0.45           |
| S                                     | 6              |
| varS                                  | 43.33          |
| tau                                   | 0.29           |
| mean                                  | 0.02           |
| sd                                    | 0.03           |
| cov                                   | 1.05           |
| results                               | NO CLEAR TREND |

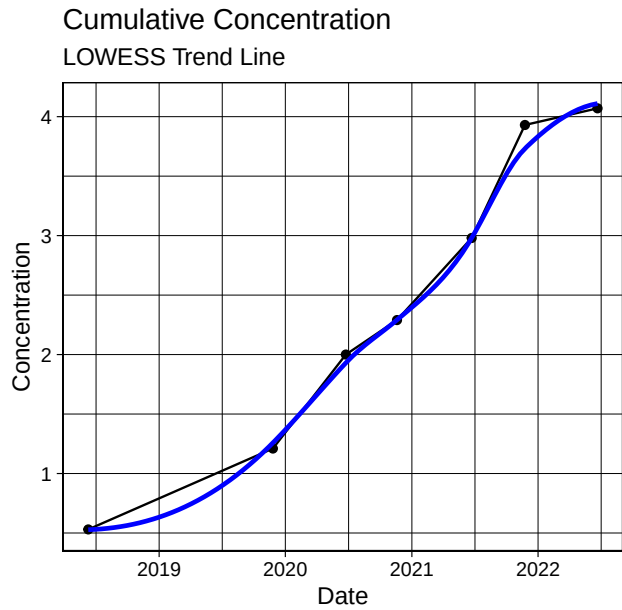
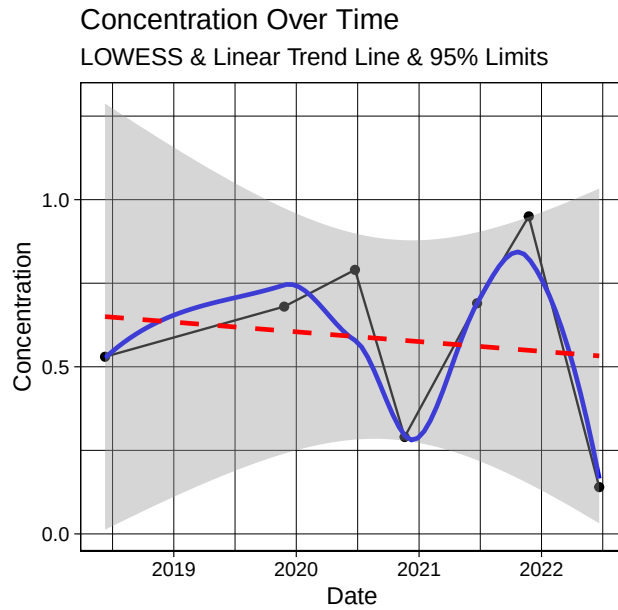
Report for ID : MW165 and Analyte : SumofPFOSandPFHxS





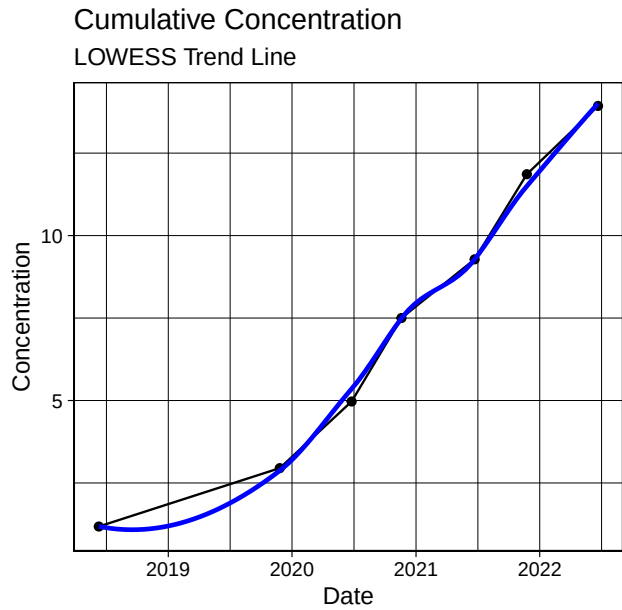
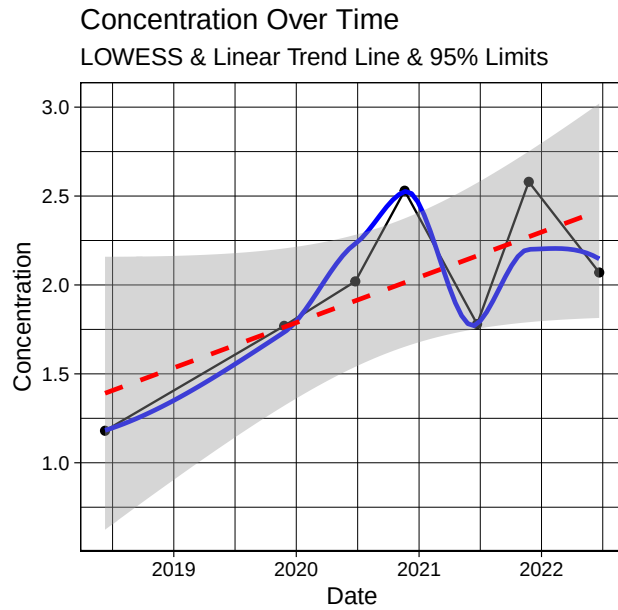
| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 7              |
| z                                     | 0              |
| p                                     | 1              |
| S                                     | 1              |
| varS                                  | 44.33          |
| tau                                   | 0.05           |
| mean                                  | 0.58           |
| sd                                    | 0.28           |
| cov                                   | 0.49           |
| results                               | NO CLEAR TREND |

Report for ID : MW166 and Analyte : SumofPFOSandPFHxS



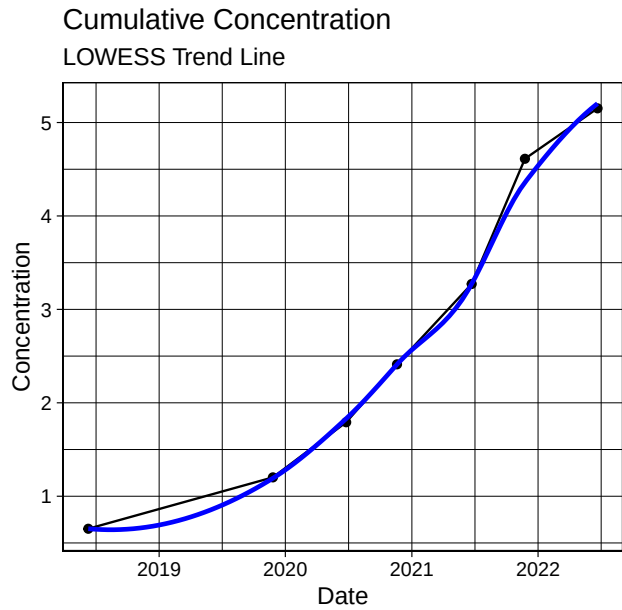
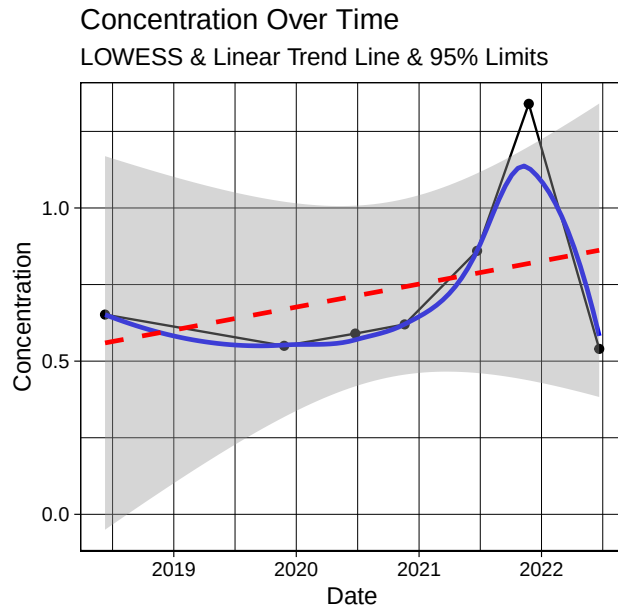
| Kendall Trend Test Results Continuous |                     |
|---------------------------------------|---------------------|
| n                                     | 7                   |
| z                                     | 1.8                 |
| p                                     | 0.07                |
| S                                     | 13                  |
| varS                                  | 44.33               |
| tau                                   | 0.62                |
| mean                                  | 1.99                |
| sd                                    | 0.48                |
| cov                                   | 0.24                |
| results                               | POSSIBLY INCREASING |

Report for ID : MW167 and Analyte : SumofPFOSandPFHxS



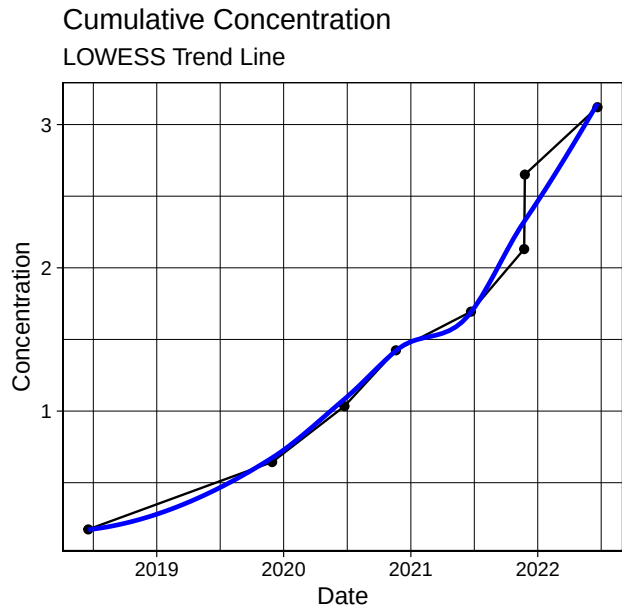
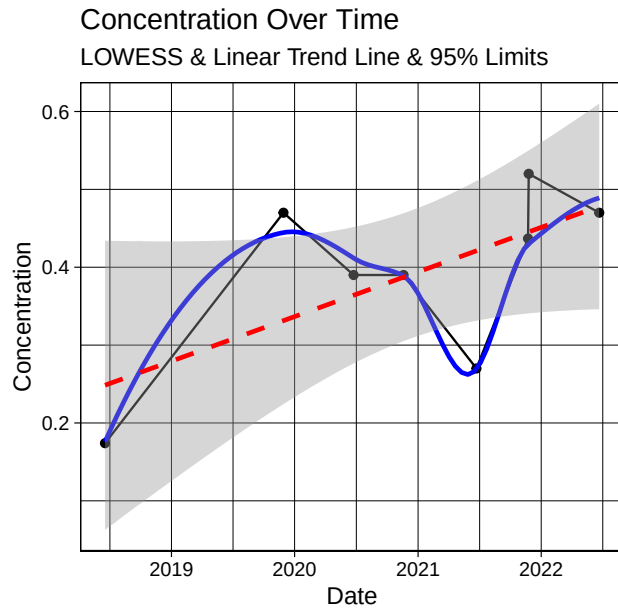
| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 7              |
| z                                     | 0.3            |
| p                                     | 0.76           |
| S                                     | 3              |
| varS                                  | 44.33          |
| tau                                   | 0.14           |
| mean                                  | 0.74           |
| sd                                    | 0.29           |
| cov                                   | 0.39           |
| results                               | NO CLEAR TREND |

Report for ID : MW168 and Analyte : SumofPFOSandPFHxS



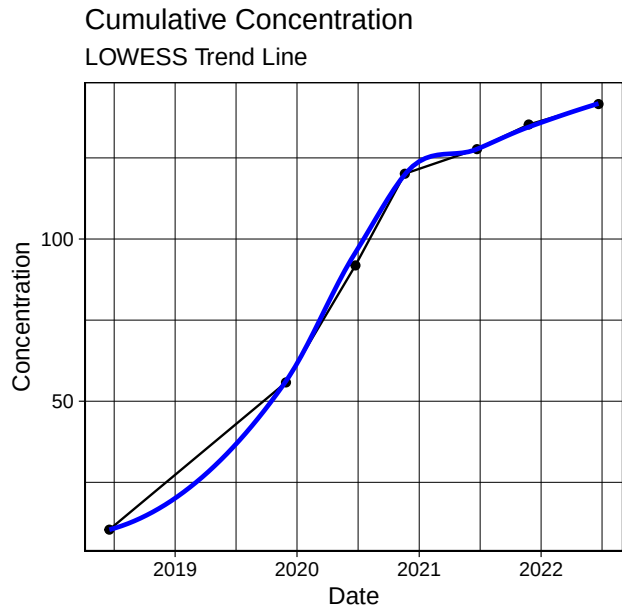
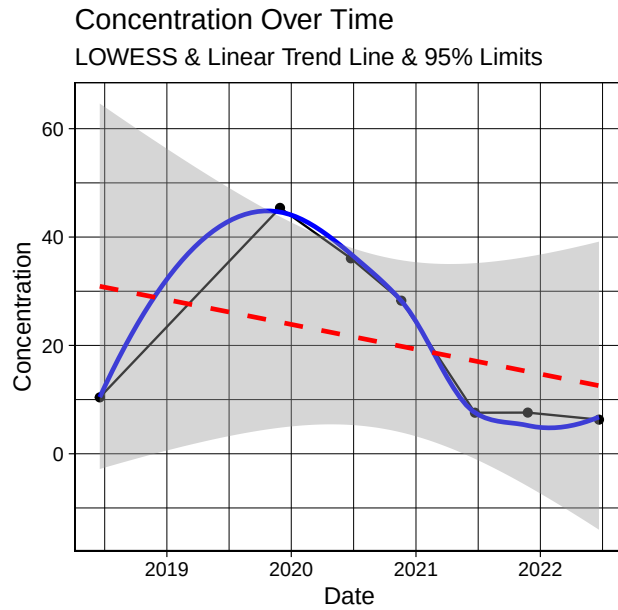
| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 8              |
| z                                     | 1.38           |
| p                                     | 0.17           |
| S                                     | 12             |
| varS                                  | 63.33          |
| tau                                   | 0.44           |
| mean                                  | 0.39           |
| sd                                    | 0.12           |
| cov                                   | 0.3            |
| results                               | NO CLEAR TREND |

Report for ID : MW170 and Analyte : SumofPFOSandPFHxS



| Kendall Trend Test Results Continuous |                     |
|---------------------------------------|---------------------|
| n                                     | 7                   |
| z                                     | -1.8                |
| p                                     | 0.07                |
| S                                     | -13                 |
| varS                                  | 44.33               |
| tau                                   | -0.62               |
| mean                                  | 20.23               |
| sd                                    | 16.11               |
| cov                                   | 0.8                 |
| results                               | POSSIBLY DECREASING |

Report for ID : MW172 and Analyte : SumofPFOSandPFHxS

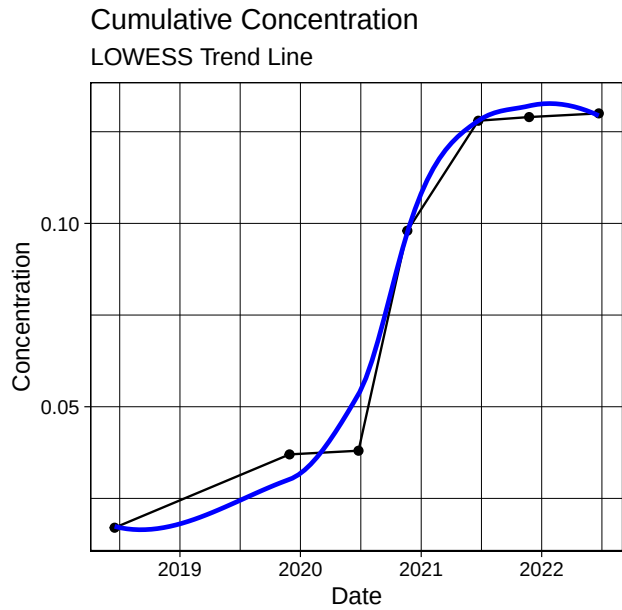
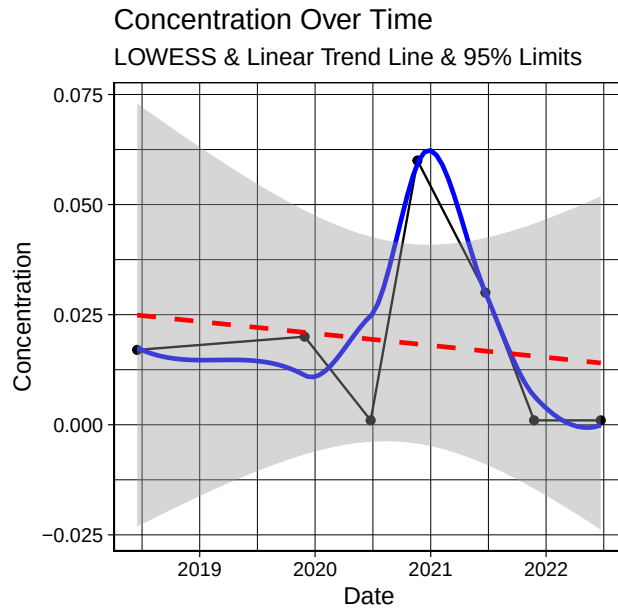


| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 7              |
| z                                     | -0.47          |
| p                                     | 0.64           |
| S                                     | -4             |
| varS                                  | 40.67          |
| tau                                   | -0.21          |
| mean                                  | 0.02           |
| sd                                    | 0.02           |
| cov                                   | 1.16           |
| results                               | NO CLEAR TREND |

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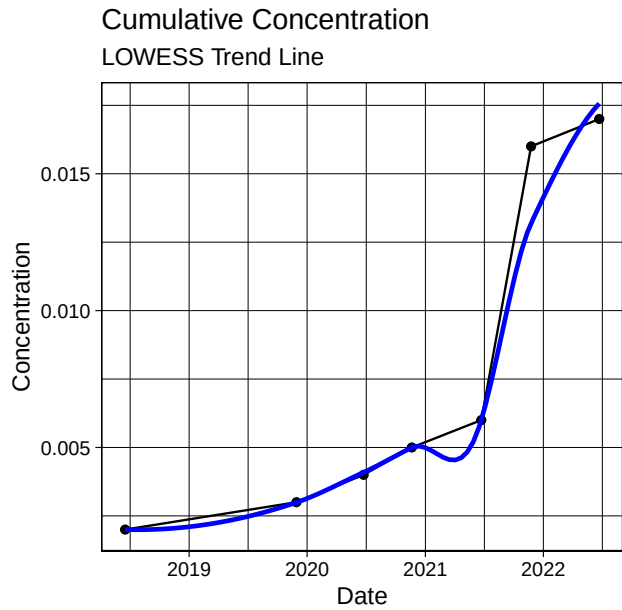
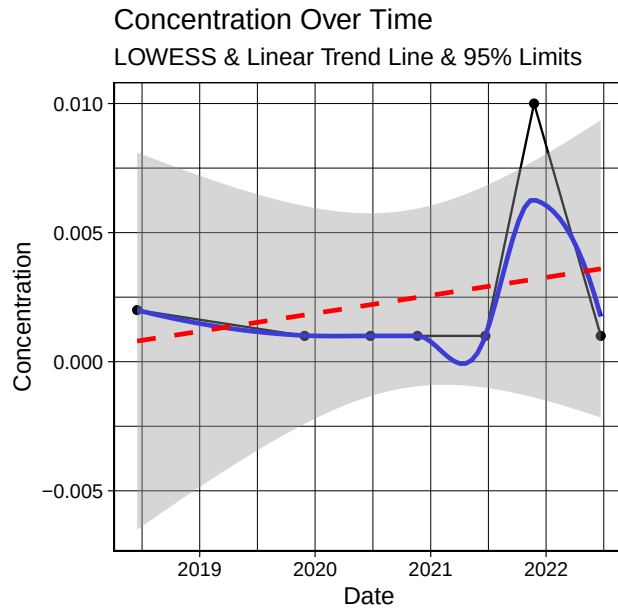
Report for ID : MW175 and Analyte : SumofPFOSandPFHxS

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| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 7              |
| z                                     | 0              |
| p                                     | 1              |
| S                                     | -1             |
| varS                                  | 27.67          |
| tau                                   | -0.07          |
| mean                                  | 0              |
| sd                                    | 0              |
| cov                                   | 1.38           |
| results                               | NO CLEAR TREND |

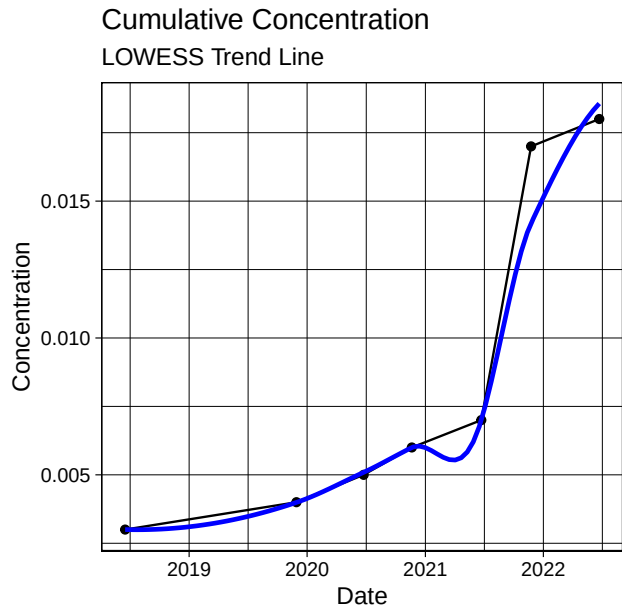
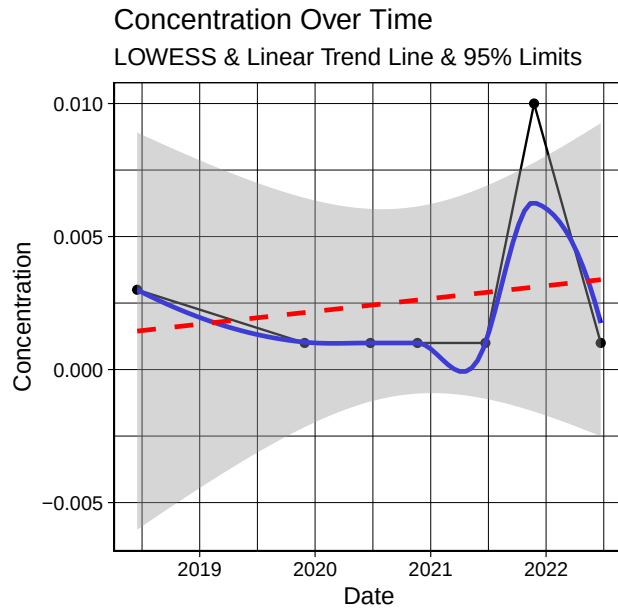
Report for ID : MW176 and Analyte : SumofPFOSandPFHxS





| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 7              |
| z                                     | 0              |
| p                                     | 1              |
| S                                     | -1             |
| varS                                  | 27.67          |
| tau                                   | -0.07          |
| mean                                  | 0              |
| sd                                    | 0              |
| cov                                   | 1.31           |
| results                               | NO CLEAR TREND |

Report for ID : MW177 and Analyte : SumofPFOSandPFHxS

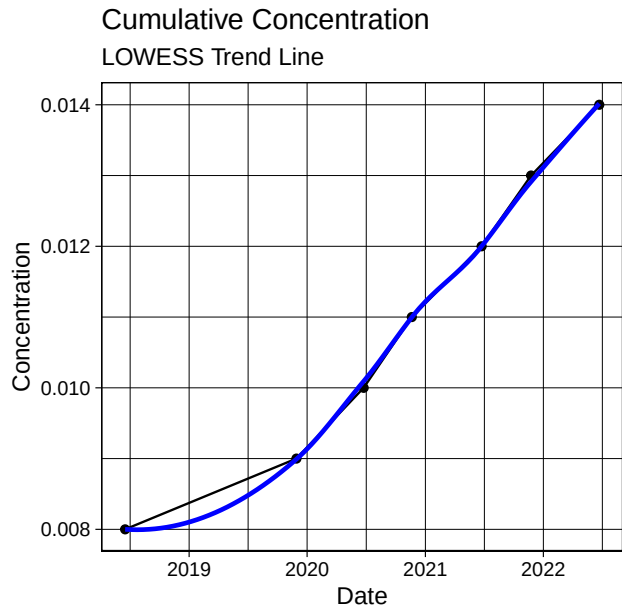
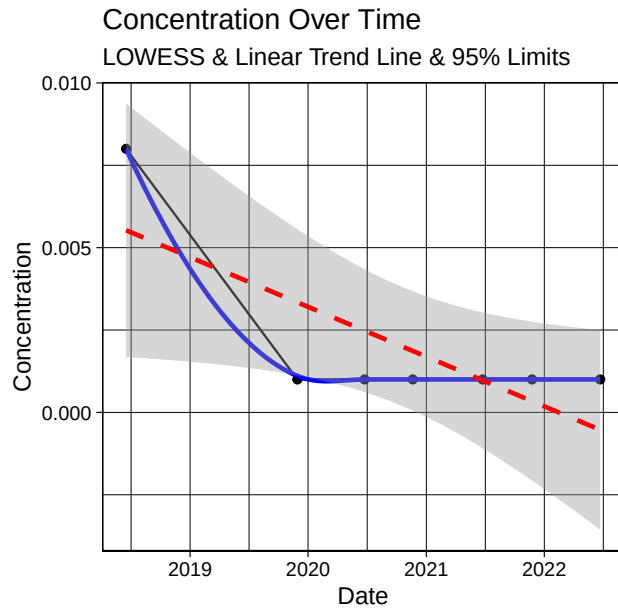


| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 7              |
| z                                     | -1.25          |
| p                                     | 0.21           |
| S                                     | -6             |
| varS                                  | 16             |
| tau                                   | -0.53          |
| mean                                  | 0              |
| sd                                    | 0              |
| cov                                   | 1.32           |
| results                               | NO CLEAR TREND |

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Report for ID : MW178 and Analyte : SumofPFOSandPFHxS

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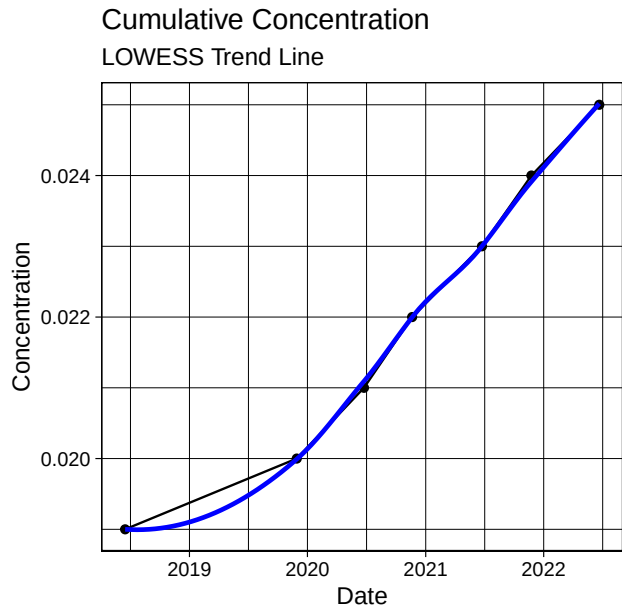
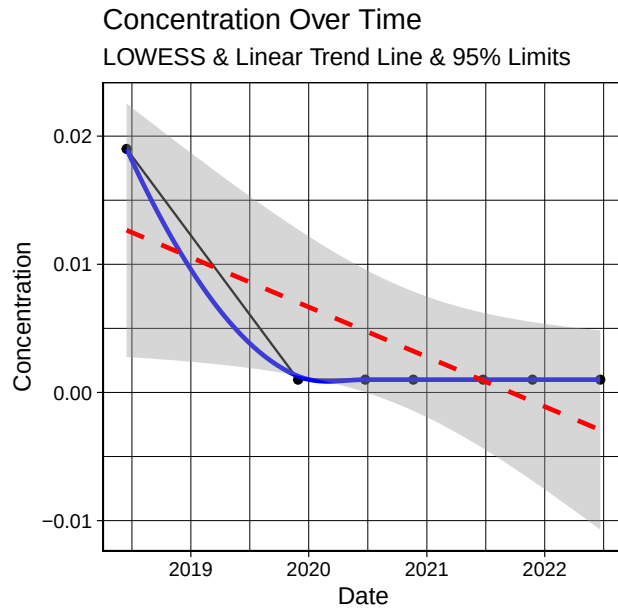


| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 7              |
| z                                     | -1.25          |
| p                                     | 0.21           |
| S                                     | -6             |
| varS                                  | 16             |
| tau                                   | -0.53          |
| mean                                  | 0              |
| sd                                    | 0.01           |
| cov                                   | 1.9            |
| results                               | NO CLEAR TREND |

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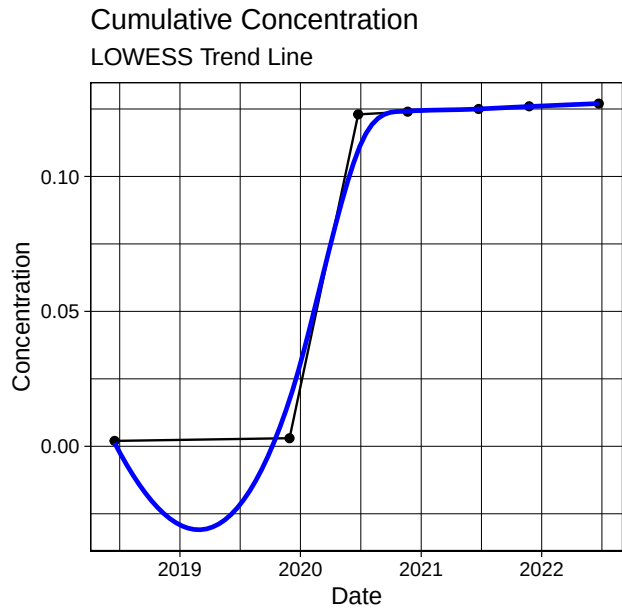
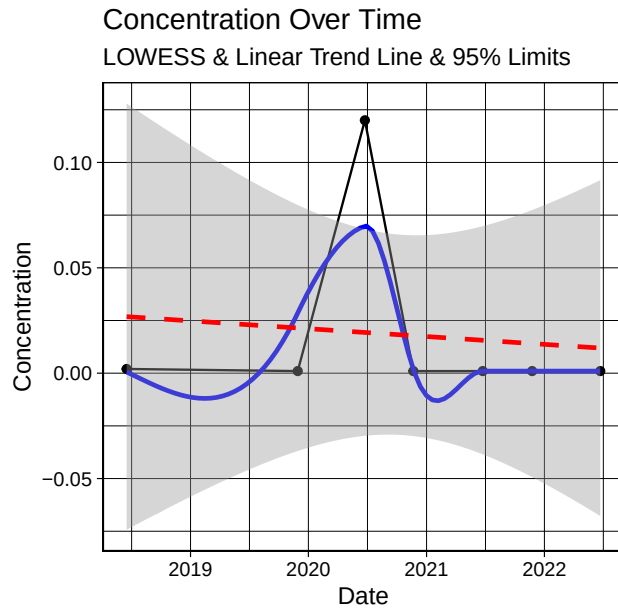
Report for ID : MW179 and Analyte : SumofPFOSandPFHxS

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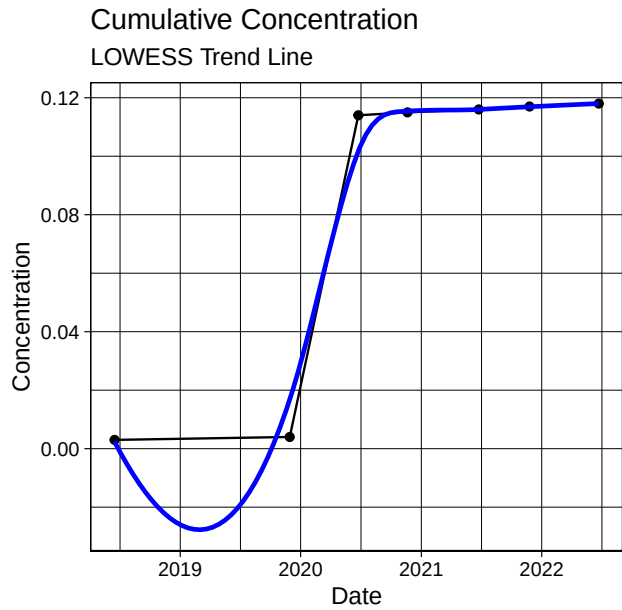
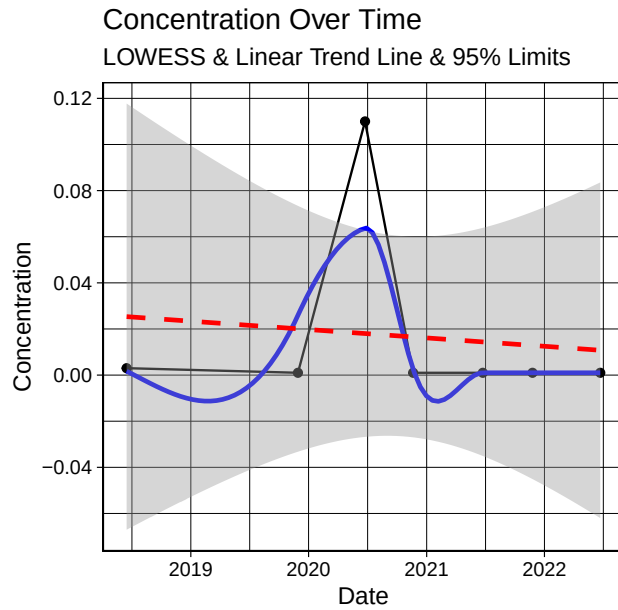
| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 7              |
| z                                     | -1.14          |
| p                                     | 0.25           |
| S                                     | -7             |
| varS                                  | 27.67          |
| tau                                   | -0.46          |
| mean                                  | 0.02           |
| sd                                    | 0.04           |
| cov                                   | 2.48           |
| results                               | NO CLEAR TREND |

Report for ID : MW180 and Analyte : SumofPFOSandPFHxS



| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 7              |
| z                                     | -1.14          |
| p                                     | 0.25           |
| S                                     | -7             |
| varS                                  | 27.67          |
| tau                                   | -0.46          |
| mean                                  | 0.02           |
| sd                                    | 0.04           |
| cov                                   | 2.44           |
| results                               | NO CLEAR TREND |

Report for ID : MW181 and Analyte : SumofPFOSandPFHxS

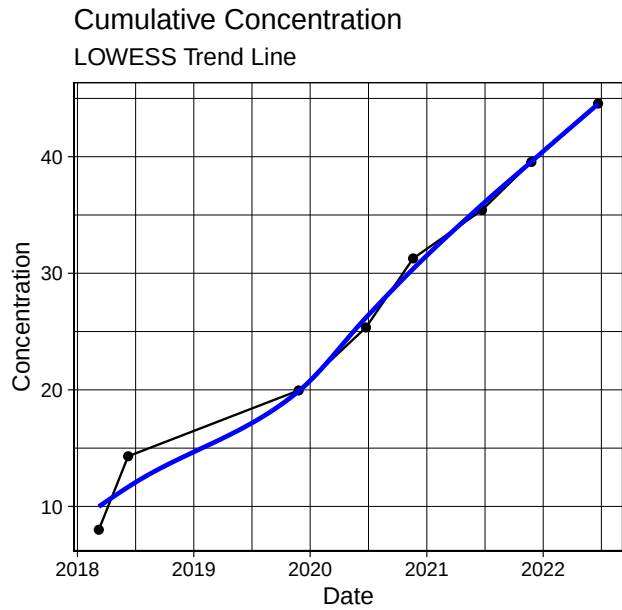
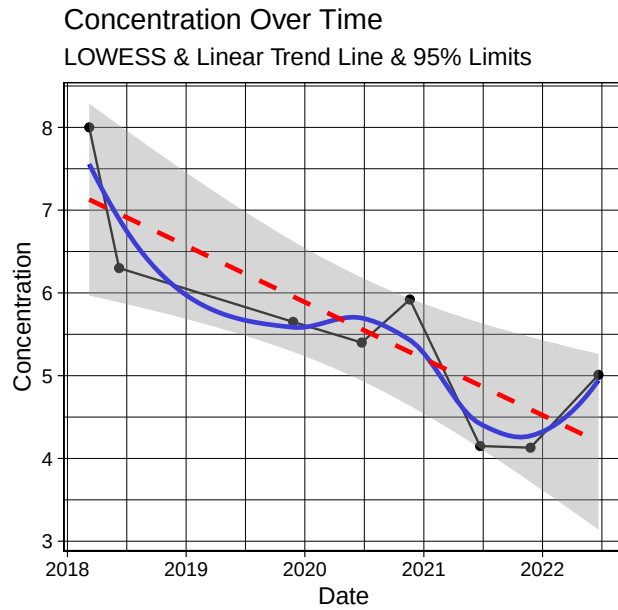


| Kendall Trend Test Results Continuous |            |
|---------------------------------------|------------|
| n                                     | 8          |
| z                                     | -2.35      |
| p                                     | 0.02       |
| S                                     | -20        |
| varS                                  | 65.33      |
| tau                                   | -0.71      |
| mean                                  | 5.57       |
| sd                                    | 1.25       |
| cov                                   | 0.23       |
| results                               | DECREASING |

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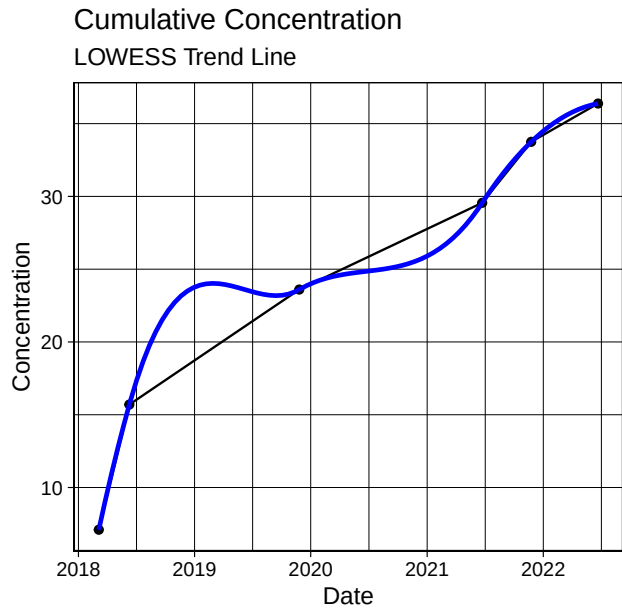
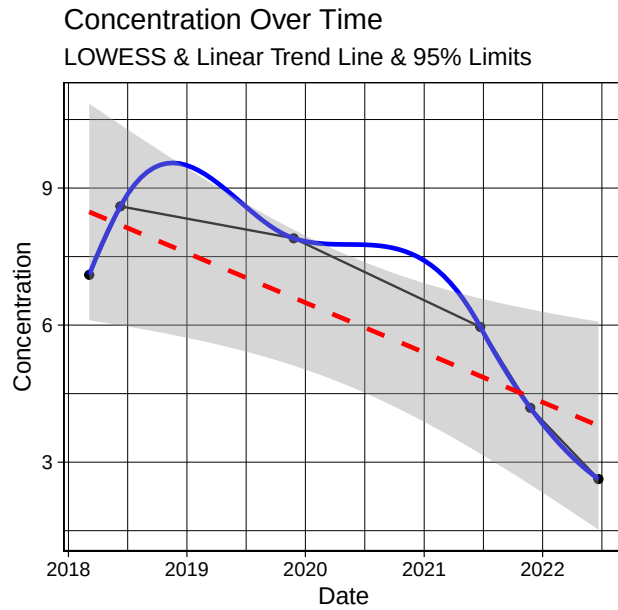
Report for ID : MW211 and Analyte : SumofPFOSandPFHxS

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| Kendall Trend Test Results Continuous |                     |
|---------------------------------------|---------------------|
| n                                     | 6                   |
| z                                     | -1.88               |
| p                                     | 0.06                |
| S                                     | -11                 |
| varS                                  | 28.33               |
| tau                                   | -0.73               |
| mean                                  | 6.06                |
| sd                                    | 2.29                |
| cov                                   | 0.38                |
| results                               | POSSIBLY DECREASING |

Report for ID : MW233 and Analyte : SumofPFOSandPFHxS





# Trend Report

Report Date & Time: 2023-03-09 07:51:19

Data File Name: 0960\_inputPFOA2022.csv

Report Title: Groundwater PFOA Trend

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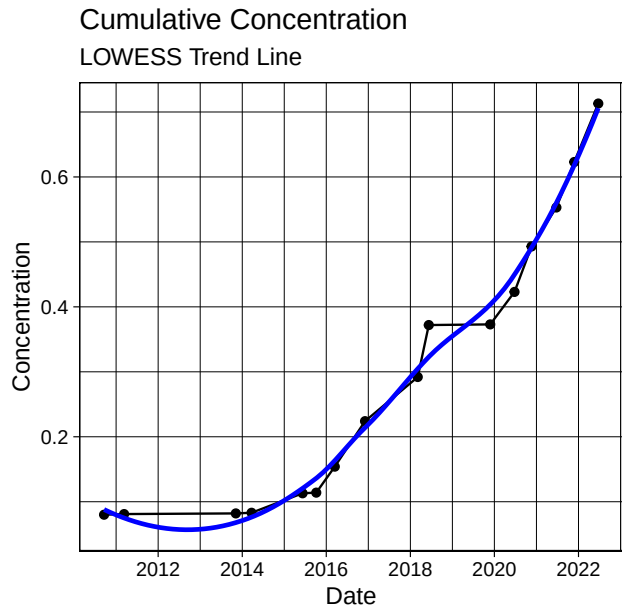
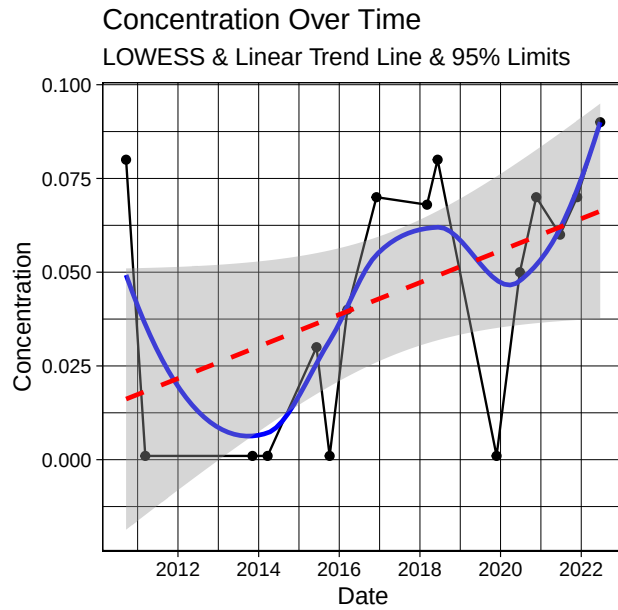
We encourage the reporting of bugs, issues, new ideas and contributions. If you want to report a bug, issue or have an idea to add to Open UCL you can email [openstatsonline@gmail.com](mailto:openstatsonline@gmail.com). Or if you are on github you can also use this link to post an issue on the Open UCL Repository.

| Kendall Trend Test Results Continuous |            |
|---------------------------------------|------------|
| n                                     | 16         |
| z                                     | 2.16       |
| p                                     | 0.03       |
| S                                     | 48         |
| varS                                  | 472        |
| tau                                   | 0.43       |
| mean                                  | 0.04       |
| sd                                    | 0.03       |
| cov                                   | 0.76       |
| results                               | INCREASING |

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Report for ID : MW018 and Analyte : PFOA

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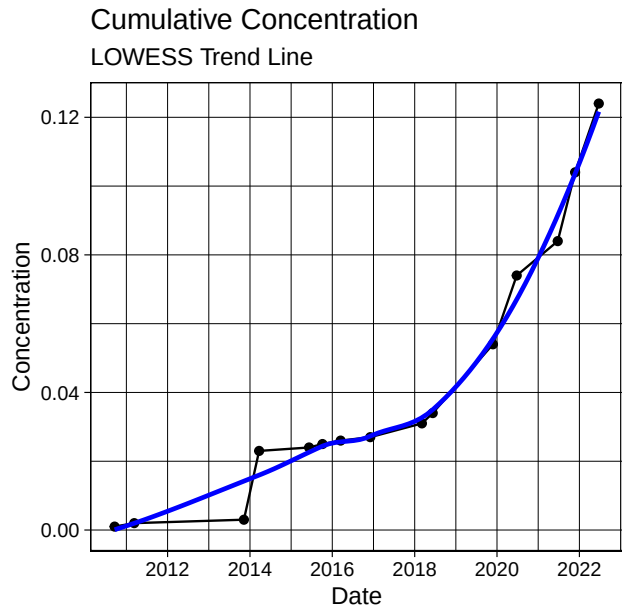
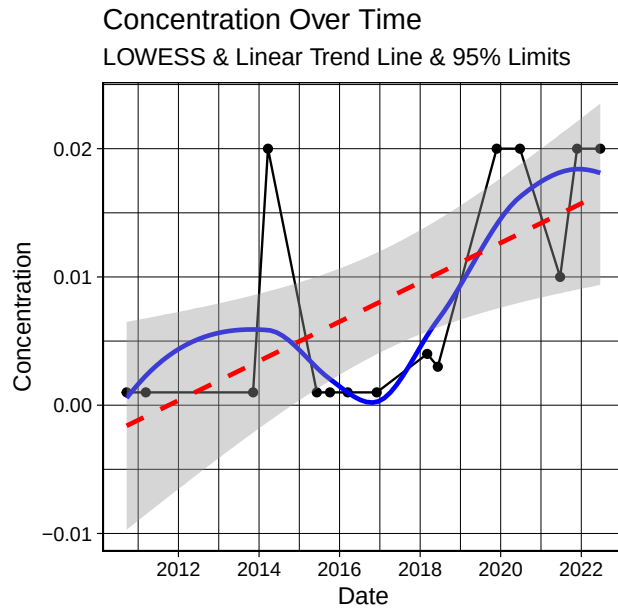


| Kendall Trend Test Results Continuous |            |
|---------------------------------------|------------|
| n                                     | 15         |
| z                                     | 2.84       |
| p                                     | 0          |
| S                                     | 54         |
| varS                                  | 347.33     |
| tau                                   | 0.61       |
| mean                                  | 0.01       |
| sd                                    | 0.01       |
| cov                                   | 1.08       |
| results                               | INCREASING |

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Report for ID : MW021 and Analyte : PFOA

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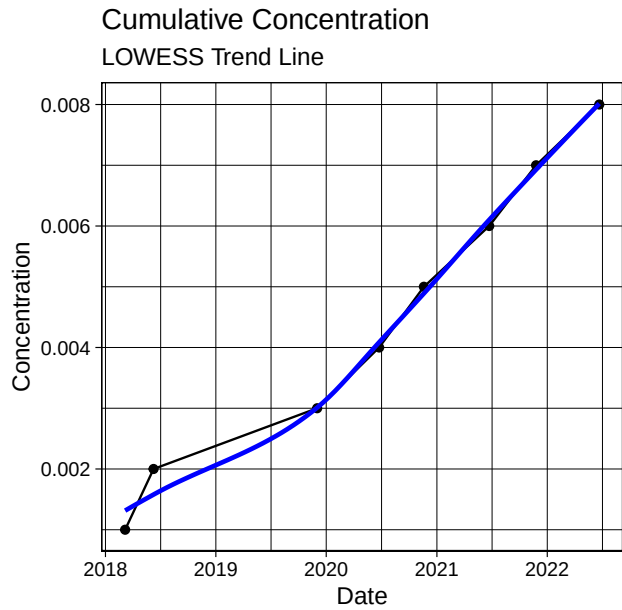
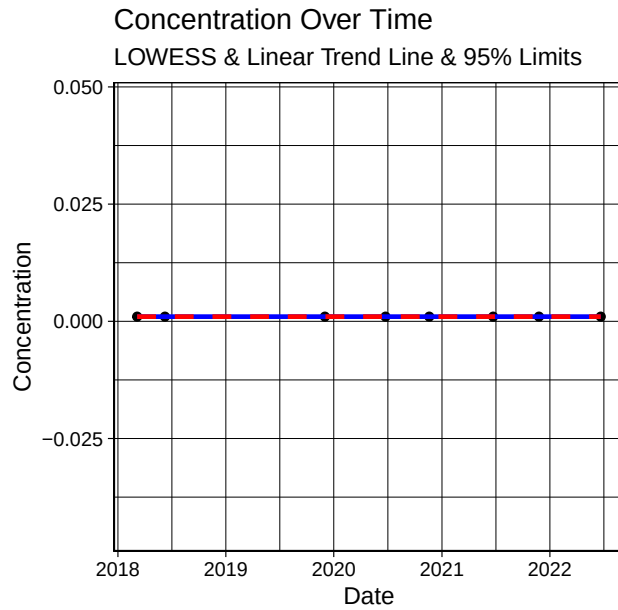


| Kendall Trend Test Results Continuous |     |
|---------------------------------------|-----|
| n                                     | 8   |
| z                                     | NaN |
| p                                     | NaN |
| S                                     | 0   |
| varS                                  | 0   |
| tau                                   | NaN |
| mean                                  | 0   |
| sd                                    | 0   |
| cov                                   | 0   |
| results                               | NA  |

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Report for ID : MW102 and Analyte : PFOA

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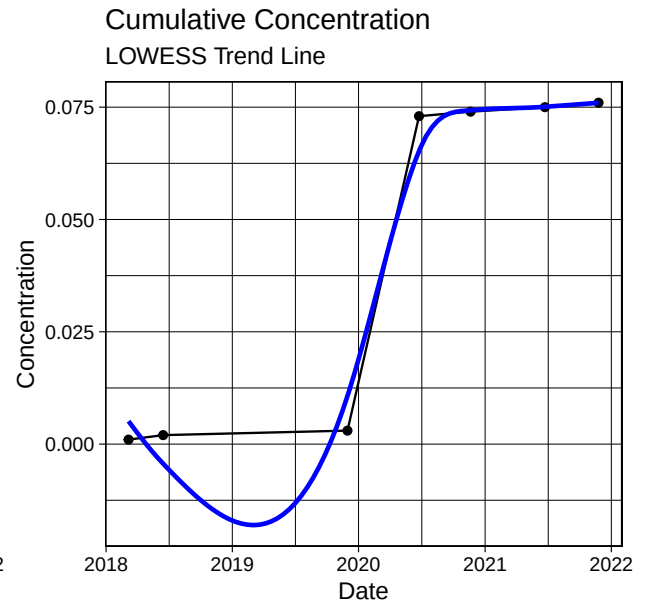
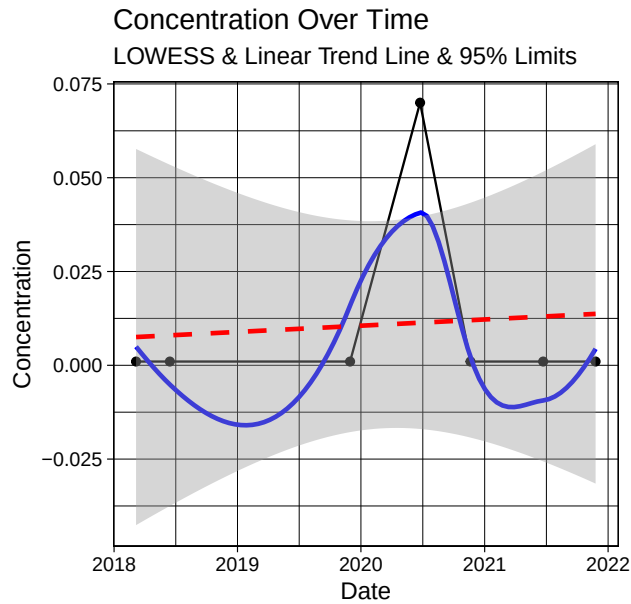


| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 7              |
| z                                     | 0              |
| p                                     | 1              |
| S                                     | 0              |
| varS                                  | 16             |
| tau                                   | 0              |
| mean                                  | 0.01           |
| sd                                    | 0.03           |
| cov                                   | 2.4            |
| results                               | NO CLEAR TREND |

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Report for ID : MW103 and Analyte : PFOA

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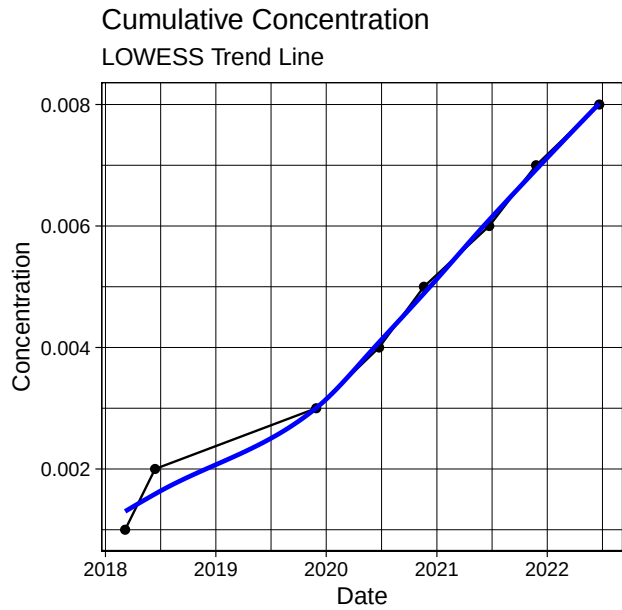
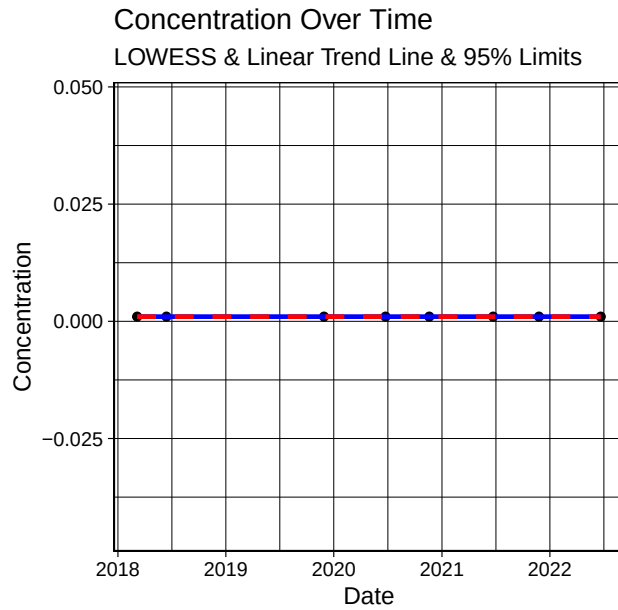


| Kendall Trend Test Results Continuous |     |
|---------------------------------------|-----|
| n                                     | 8   |
| z                                     | NaN |
| p                                     | NaN |
| S                                     | 0   |
| varS                                  | 0   |
| tau                                   | NaN |
| mean                                  | 0   |
| sd                                    | 0   |
| cov                                   | 0   |
| results                               | NA  |

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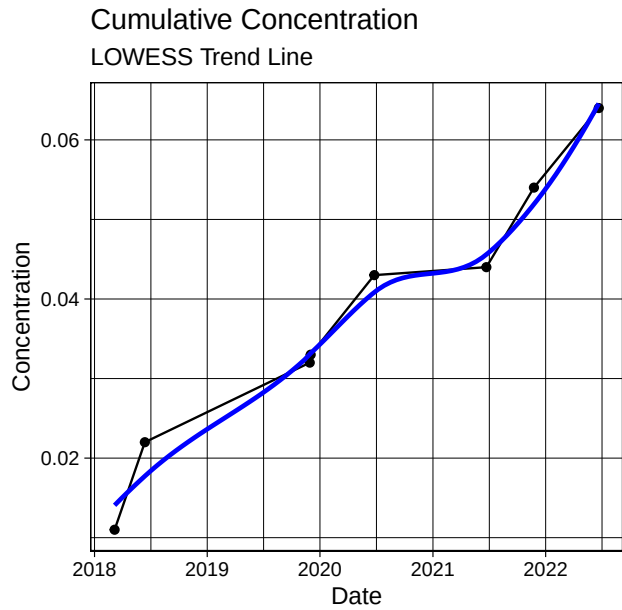
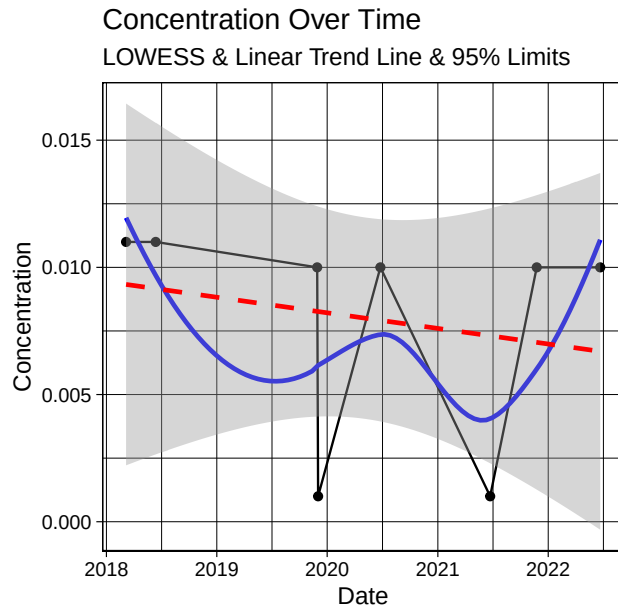
Report for ID : MW104 and Analyte : PFOA

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| Kendall Trend Test Results Continuous |        |
|---------------------------------------|--------|
| n                                     | 8      |
| z                                     | -1.22  |
| p                                     | 0.22   |
| S                                     | -10    |
| varS                                  | 54.67  |
| tau                                   | -0.42  |
| mean                                  | 0.01   |
| sd                                    | 0      |
| cov                                   | 0.54   |
| results                               | STABLE |

Report for ID : MW105 and Analyte : PFOA



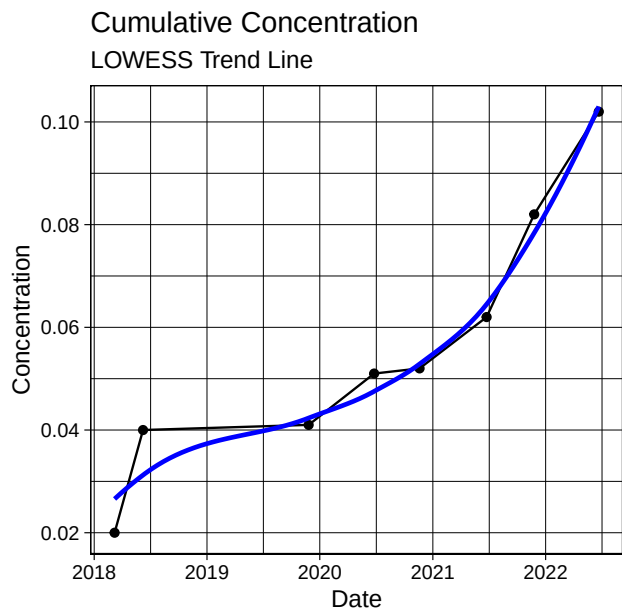
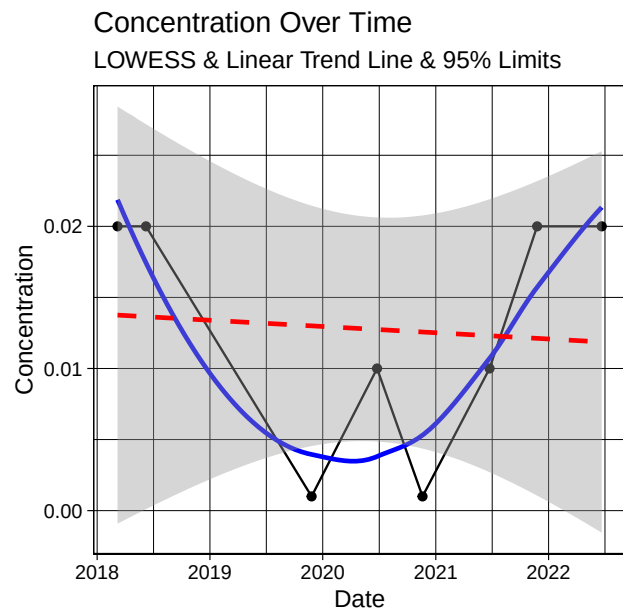


| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 8              |
| z                                     | 0.14           |
| p                                     | 0.89           |
| S                                     | 2              |
| varS                                  | 54.67          |
| tau                                   | 0.08           |
| mean                                  | 0.01           |
| sd                                    | 0.01           |
| cov                                   | 0.66           |
| results                               | NO CLEAR TREND |

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Report for ID : MW112 and Analyte : PFOA

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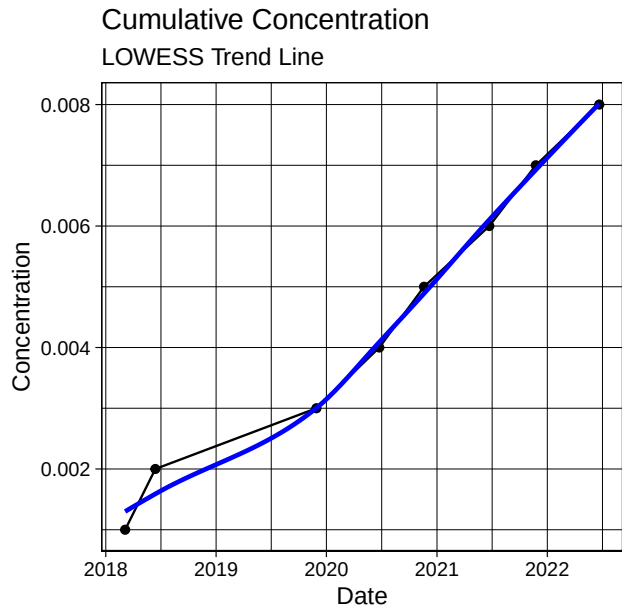
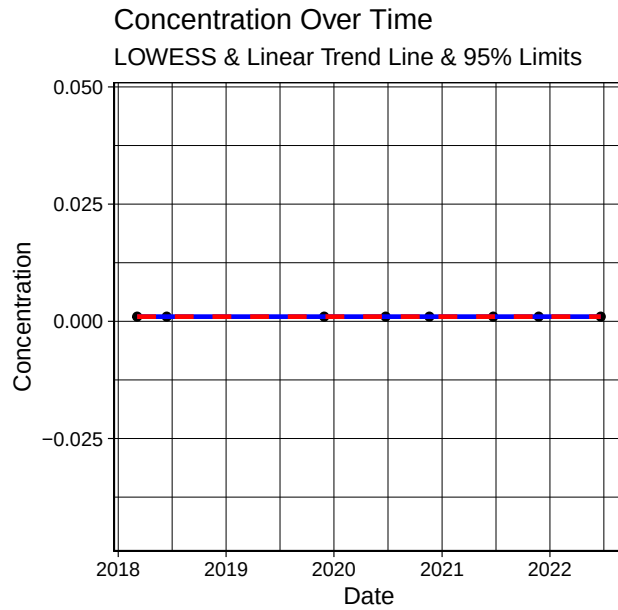


| Kendall Trend Test Results Continuous |     |
|---------------------------------------|-----|
| n                                     | 8   |
| z                                     | NaN |
| p                                     | NaN |
| S                                     | 0   |
| varS                                  | 0   |
| tau                                   | NaN |
| mean                                  | 0   |
| sd                                    | 0   |
| cov                                   | 0   |
| results                               | NA  |

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Report for ID : MW113 and Analyte : PFOA

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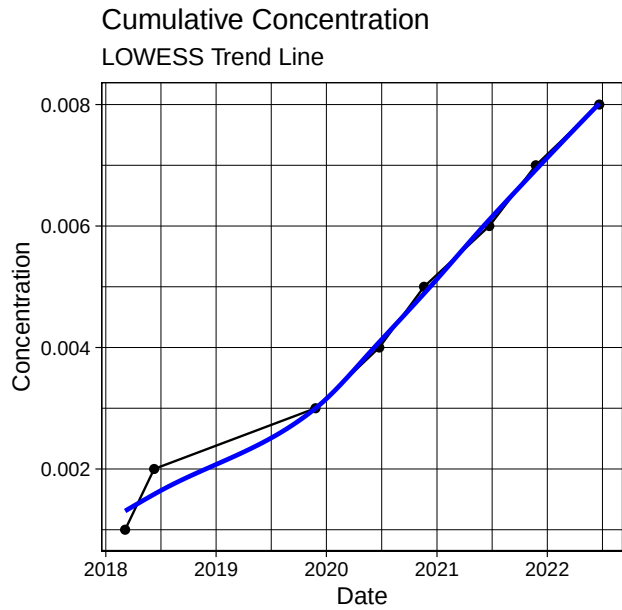
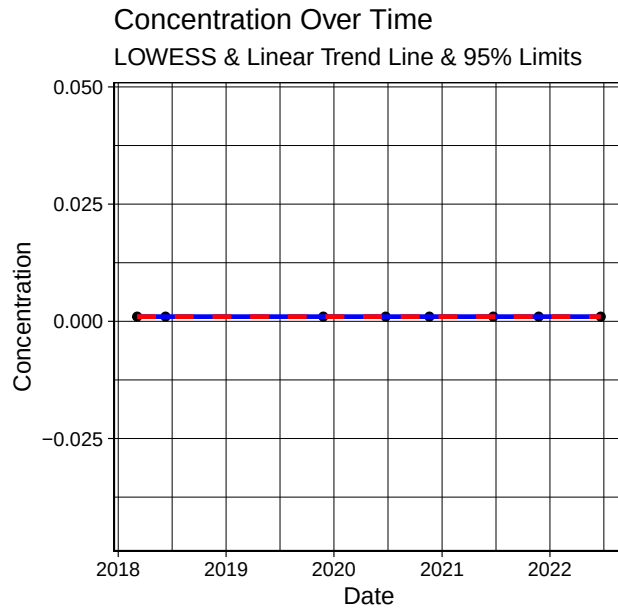


| Kendall Trend Test Results Continuous |     |
|---------------------------------------|-----|
| n                                     | 8   |
| z                                     | NaN |
| p                                     | NaN |
| S                                     | 0   |
| varS                                  | 0   |
| tau                                   | NaN |
| mean                                  | 0   |
| sd                                    | 0   |
| cov                                   | 0   |
| results                               | NA  |

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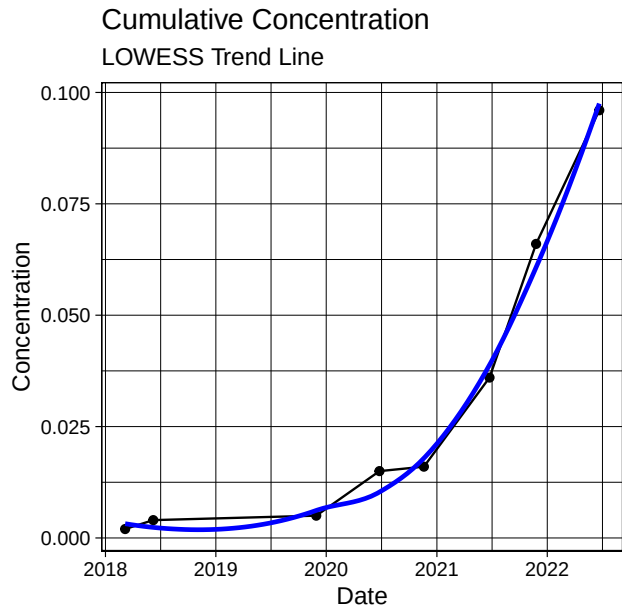
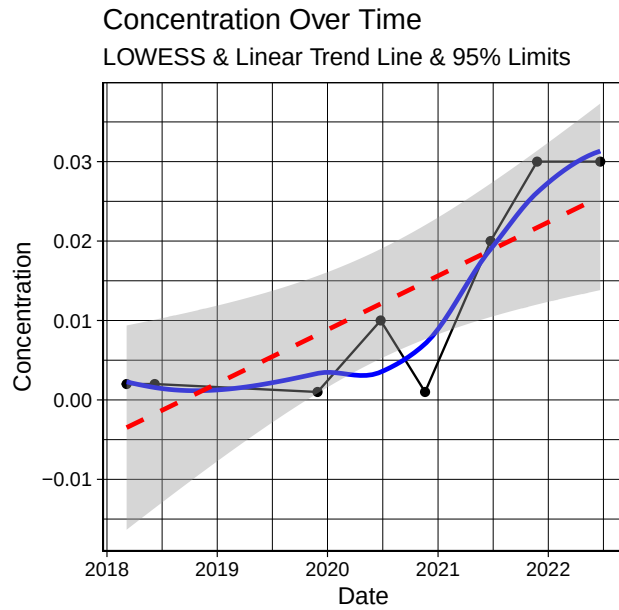
Report for ID : MW114 and Analyte : PFOA

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| Kendall Trend Test Results Continuous |                     |
|---------------------------------------|---------------------|
| n                                     | 8                   |
| z                                     | 1.77                |
| p                                     | 0.08                |
| S                                     | 15                  |
| varS                                  | 62.33               |
| tau                                   | 0.57                |
| mean                                  | 0.01                |
| sd                                    | 0.01                |
| cov                                   | 1.07                |
| results                               | POSSIBLY INCREASING |

Report for ID : MW115 and Analyte : PFOA

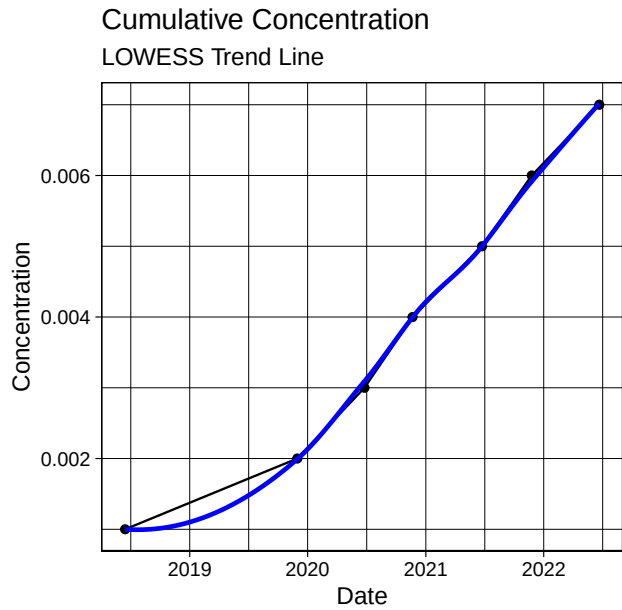
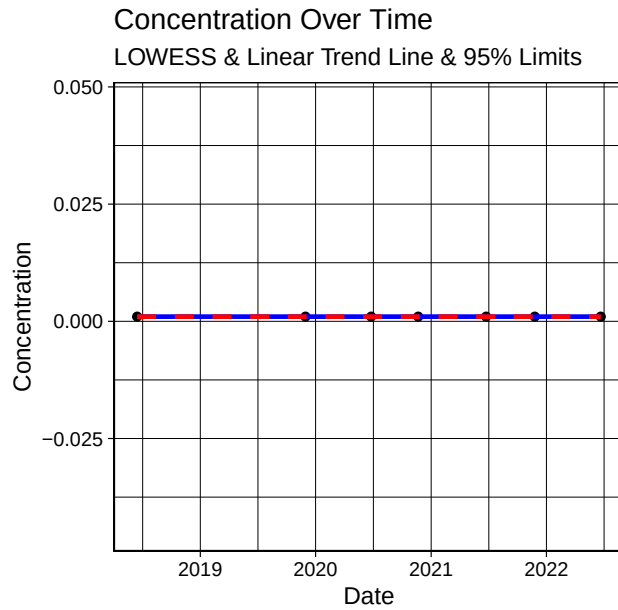


| Kendall Trend Test Results Continuous |     |
|---------------------------------------|-----|
| n                                     | 7   |
| z                                     | NaN |
| p                                     | NaN |
| S                                     | 0   |
| varS                                  | 0   |
| tau                                   | NaN |
| mean                                  | 0   |
| sd                                    | 0   |
| cov                                   | 0   |
| results                               | NA  |

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Report for ID : MW122 and Analyte : PFOA

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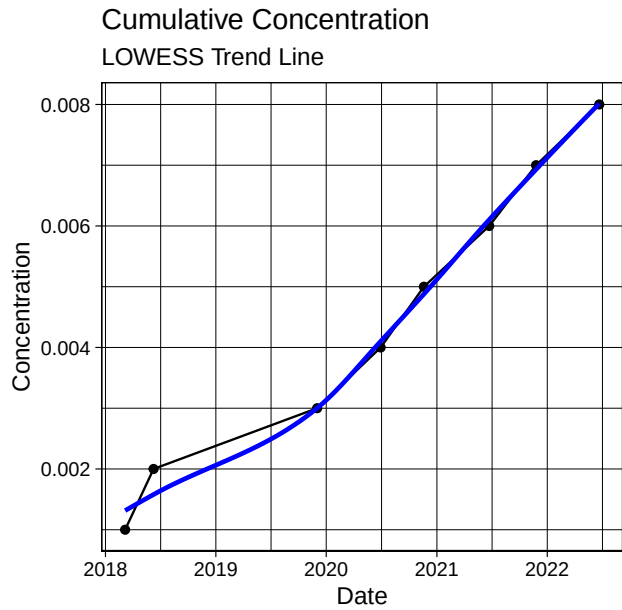
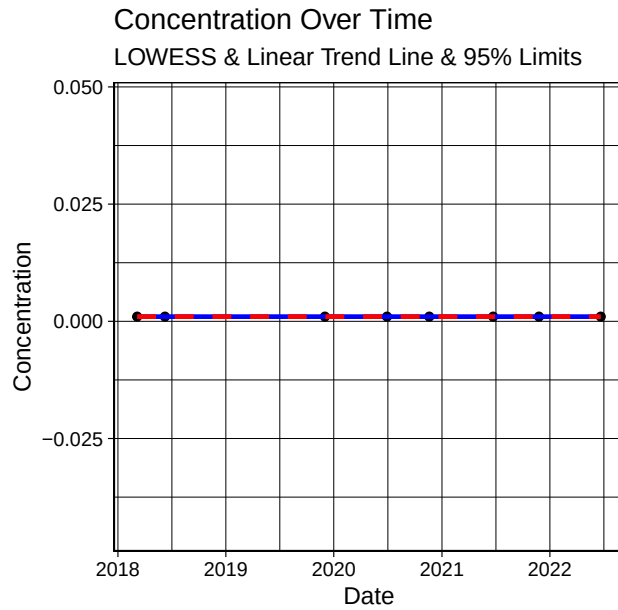


| Kendall Trend Test Results Continuous |     |
|---------------------------------------|-----|
| n                                     | 8   |
| z                                     | NaN |
| p                                     | NaN |
| S                                     | 0   |
| varS                                  | 0   |
| tau                                   | NaN |
| mean                                  | 0   |
| sd                                    | 0   |
| cov                                   | 0   |
| results                               | NA  |

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Report for ID : MW124 and Analyte : PFOA

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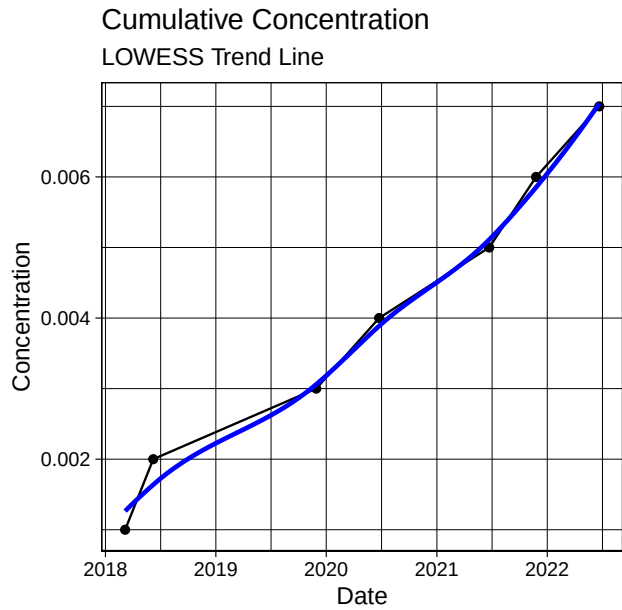
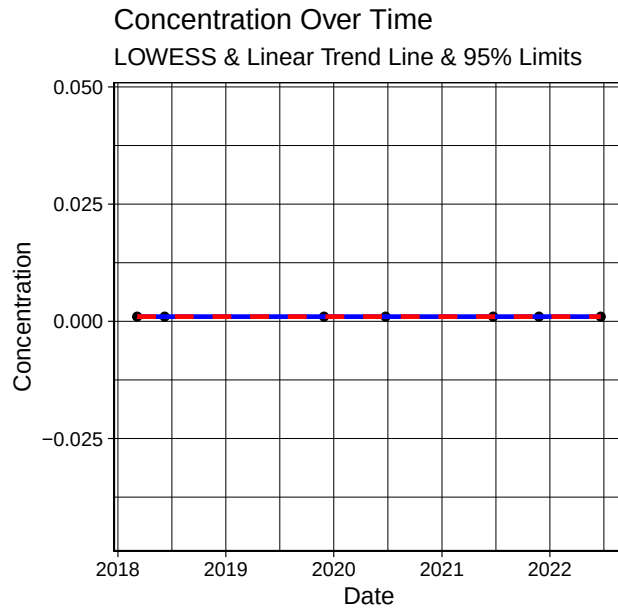


| Kendall Trend Test Results Continuous |     |
|---------------------------------------|-----|
| n                                     | 7   |
| z                                     | NaN |
| p                                     | NaN |
| S                                     | 0   |
| varS                                  | 0   |
| tau                                   | NaN |
| mean                                  | 0   |
| sd                                    | 0   |
| cov                                   | 0   |
| results                               | NA  |

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Report for ID : MW126 and Analyte : PFOA

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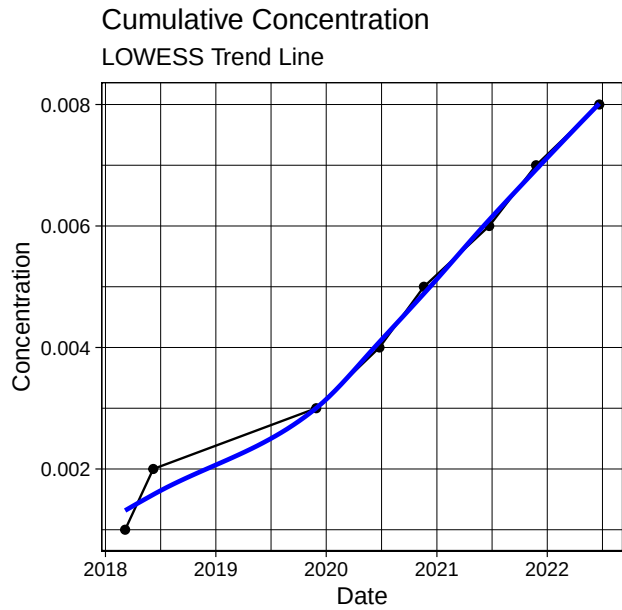
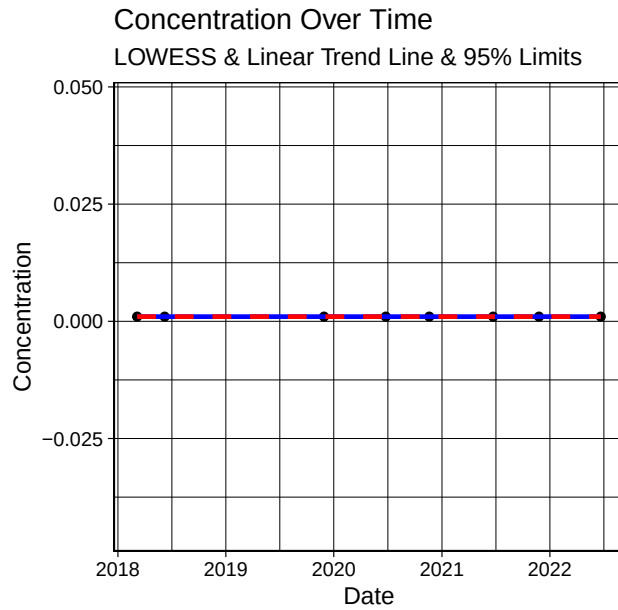


| Kendall Trend Test Results Continuous |     |
|---------------------------------------|-----|
| n                                     | 8   |
| z                                     | NaN |
| p                                     | NaN |
| S                                     | 0   |
| varS                                  | 0   |
| tau                                   | NaN |
| mean                                  | 0   |
| sd                                    | 0   |
| cov                                   | 0   |
| results                               | NA  |

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Report for ID : MW127 and Analyte : PFOA

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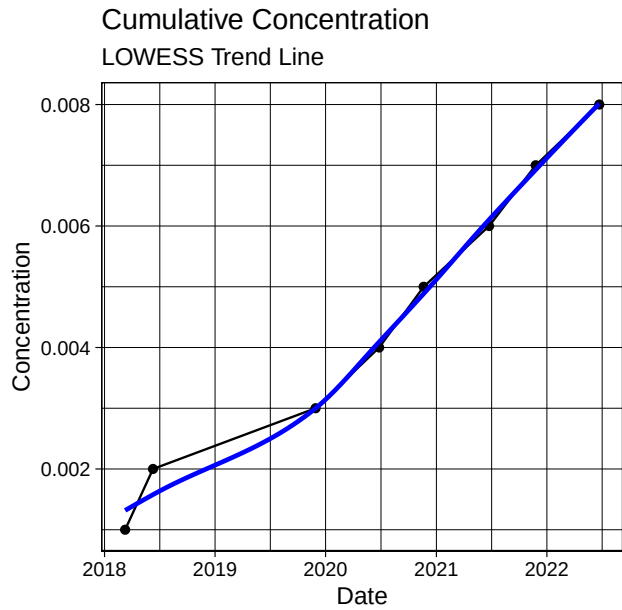
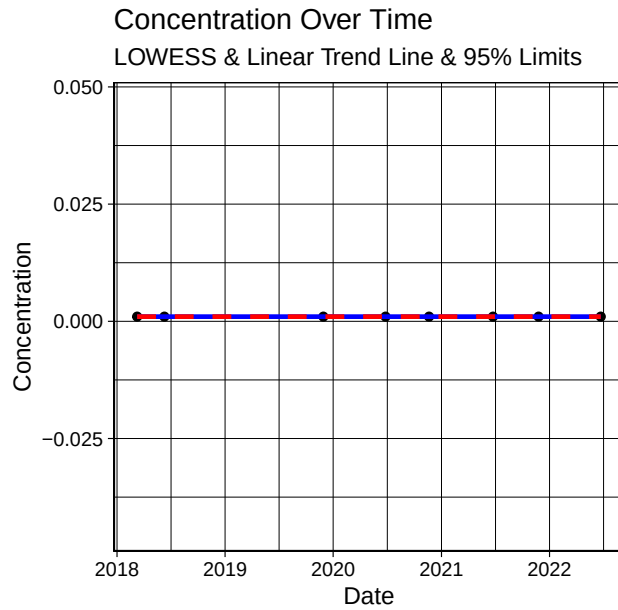


| Kendall Trend Test Results Continuous |     |
|---------------------------------------|-----|
| n                                     | 8   |
| z                                     | NaN |
| p                                     | NaN |
| S                                     | 0   |
| varS                                  | 0   |
| tau                                   | NaN |
| mean                                  | 0   |
| sd                                    | 0   |
| cov                                   | 0   |
| results                               | NA  |

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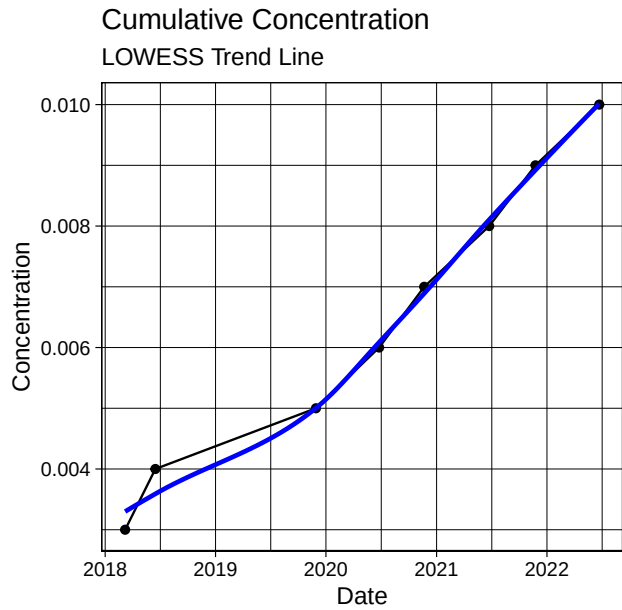
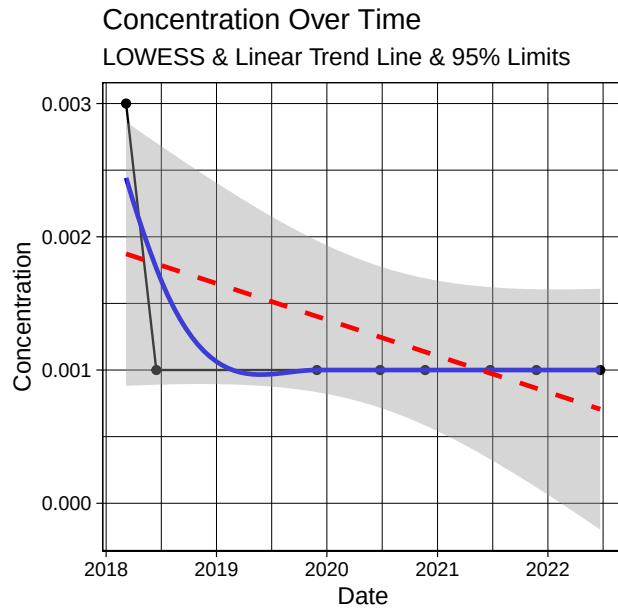
Report for ID : MW134 and Analyte : PFOA

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| Kendall Trend Test Results Continuous |        |
|---------------------------------------|--------|
| n                                     | 8      |
| z                                     | -1.31  |
| p                                     | 0.19   |
| S                                     | -7     |
| varS                                  | 21     |
| tau                                   | -0.5   |
| mean                                  | 0      |
| sd                                    | 0      |
| cov                                   | 0.57   |
| results                               | STABLE |

Report for ID : MW135 and Analyte : PFOA

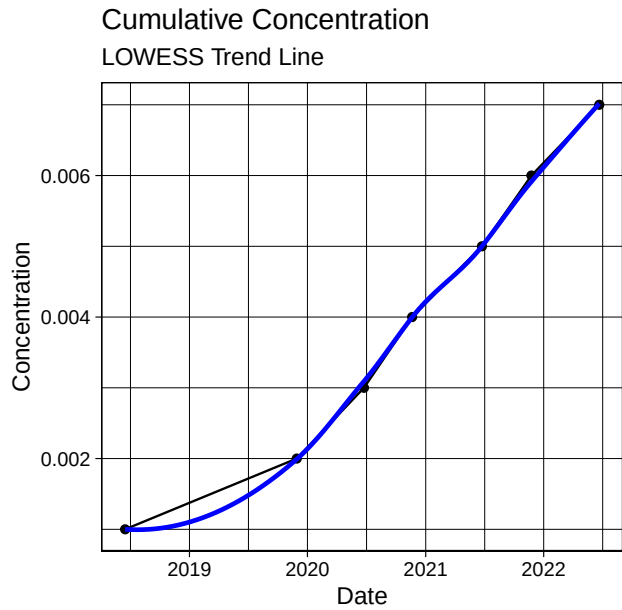
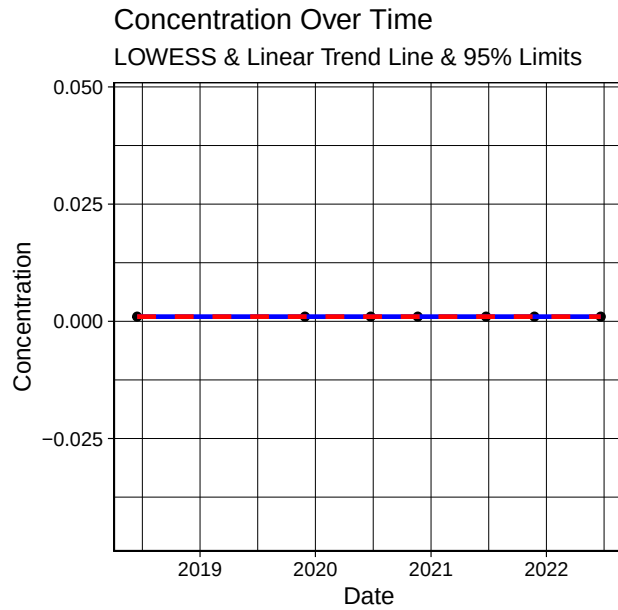


| Kendall Trend Test Results Continuous |     |
|---------------------------------------|-----|
| n                                     | 7   |
| z                                     | NaN |
| p                                     | NaN |
| S                                     | 0   |
| varS                                  | 0   |
| tau                                   | NaN |
| mean                                  | 0   |
| sd                                    | 0   |
| cov                                   | 0   |
| results                               | NA  |

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Report for ID : MW137 and Analyte : PFOA

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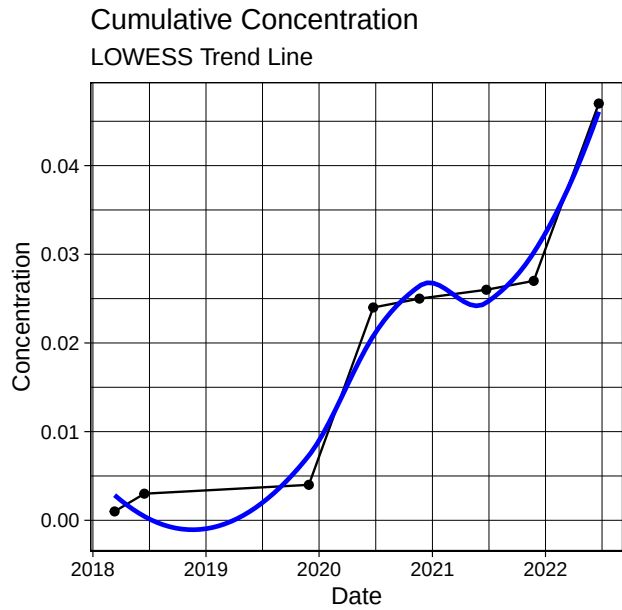
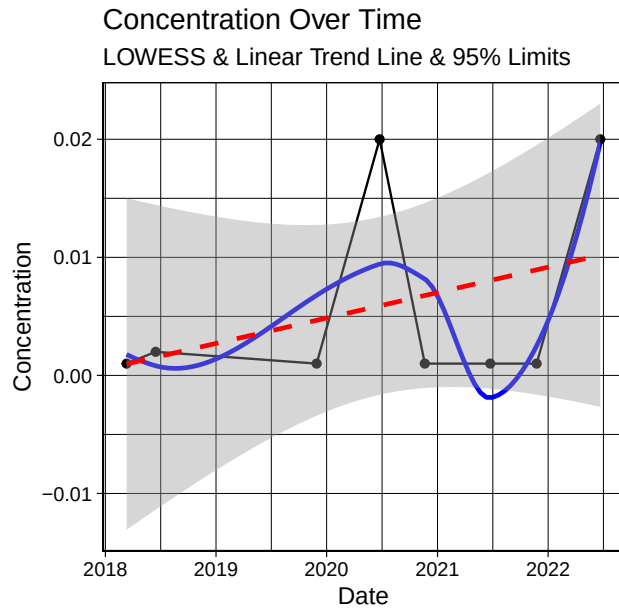


| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 8              |
| z                                     | 0.29           |
| p                                     | 0.77           |
| S                                     | 3              |
| varS                                  | 47.67          |
| tau                                   | 0.14           |
| mean                                  | 0.01           |
| sd                                    | 0.01           |
| cov                                   | 1.49           |
| results                               | NO CLEAR TREND |

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Report for ID : MW138 and Analyte : PFOA

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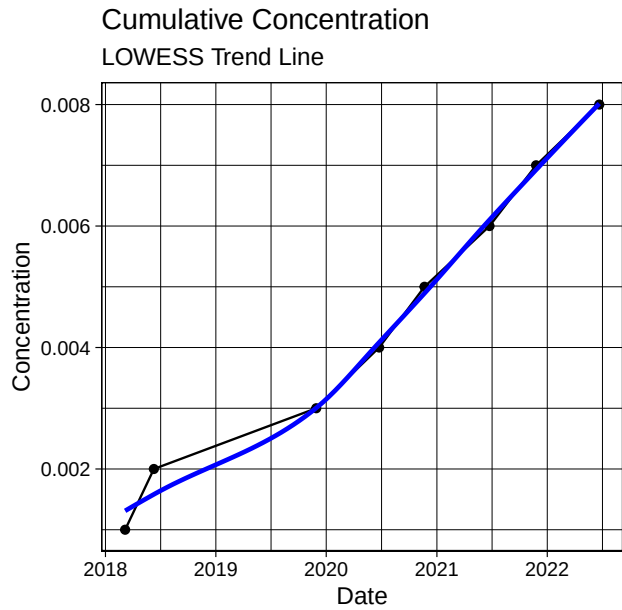
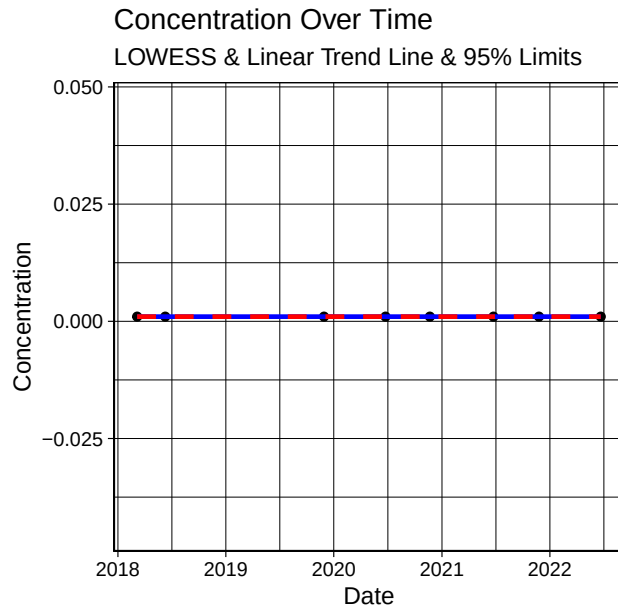


| Kendall Trend Test Results Continuous |     |
|---------------------------------------|-----|
| n                                     | 8   |
| z                                     | NaN |
| p                                     | NaN |
| S                                     | 0   |
| varS                                  | 0   |
| tau                                   | NaN |
| mean                                  | 0   |
| sd                                    | 0   |
| cov                                   | 0   |
| results                               | NA  |

---

Report for ID : MW139 and Analyte : PFOA

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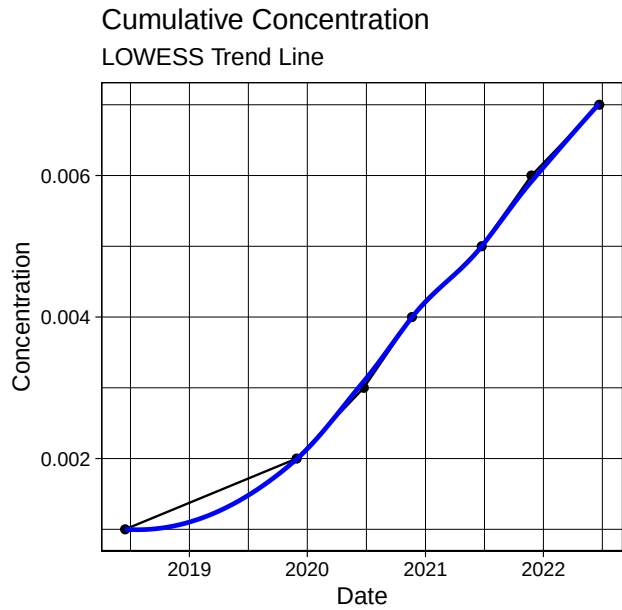
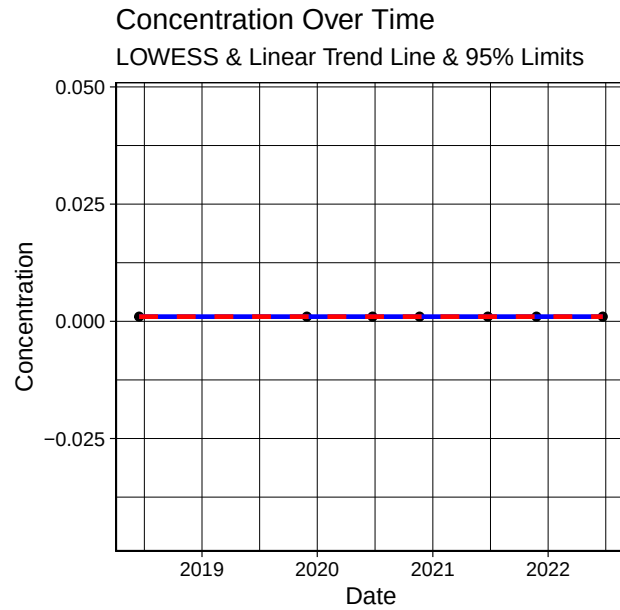


| Kendall Trend Test Results Continuous |     |
|---------------------------------------|-----|
| n                                     | 7   |
| z                                     | NaN |
| p                                     | NaN |
| S                                     | 0   |
| varS                                  | 0   |
| tau                                   | NaN |
| mean                                  | 0   |
| sd                                    | 0   |
| cov                                   | 0   |
| results                               | NA  |

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Report for ID : MW140 and Analyte : PFOA

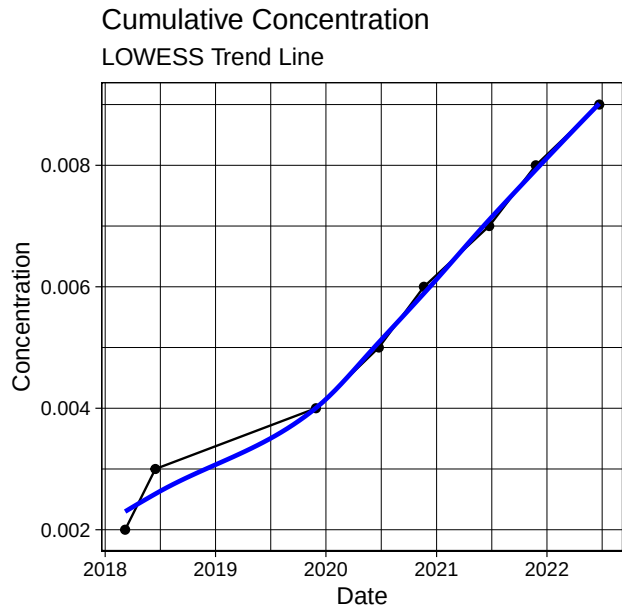
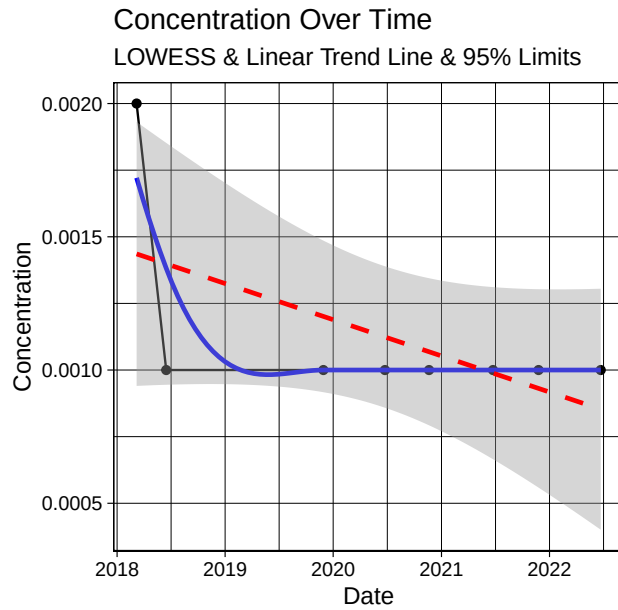
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| Kendall Trend Test Results Continuous |        |
|---------------------------------------|--------|
| n                                     | 8      |
| z                                     | -1.31  |
| p                                     | 0.19   |
| S                                     | -7     |
| varS                                  | 21     |
| tau                                   | -0.5   |
| mean                                  | 0      |
| sd                                    | 0      |
| cov                                   | 0.31   |
| results                               | STABLE |

Report for ID : MW141 and Analyte : PFOA

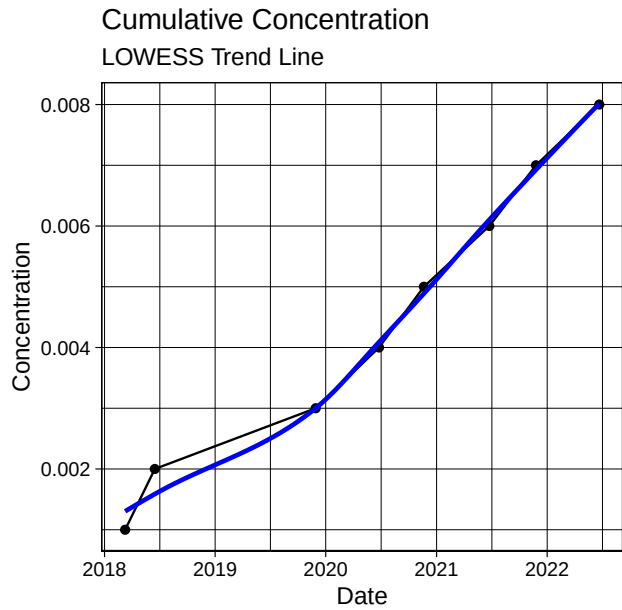
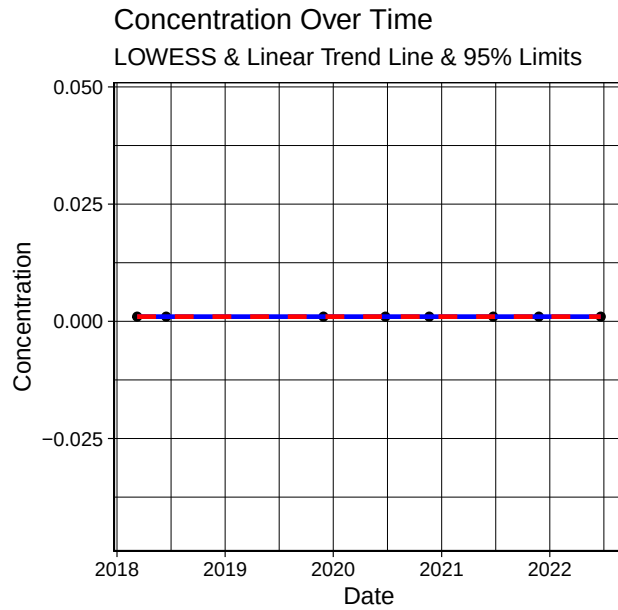


| Kendall Trend Test Results Continuous |     |
|---------------------------------------|-----|
| n                                     | 8   |
| z                                     | NaN |
| p                                     | NaN |
| S                                     | 0   |
| varS                                  | 0   |
| tau                                   | NaN |
| mean                                  | 0   |
| sd                                    | 0   |
| cov                                   | 0   |
| results                               | NA  |

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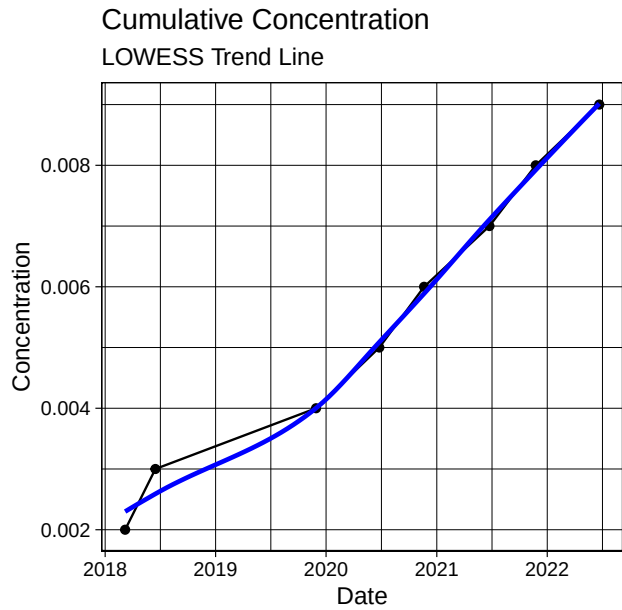
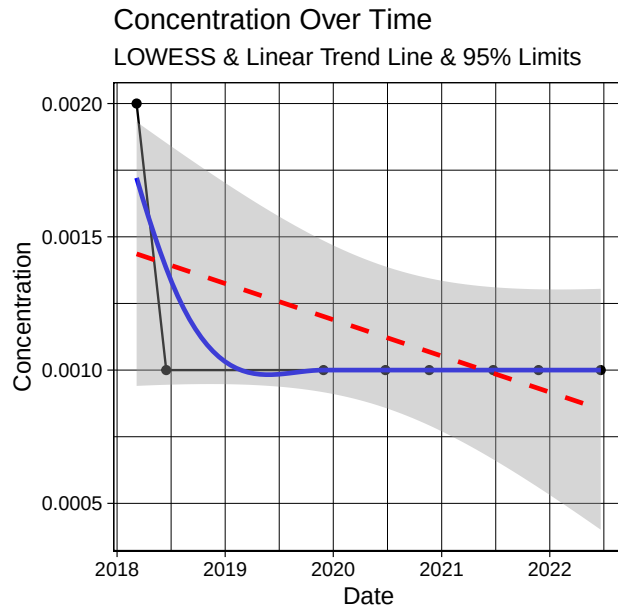
Report for ID : MW143 and Analyte : PFOA

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| Kendall Trend Test Results Continuous |        |
|---------------------------------------|--------|
| n                                     | 8      |
| z                                     | -1.31  |
| p                                     | 0.19   |
| S                                     | -7     |
| varS                                  | 21     |
| tau                                   | -0.5   |
| mean                                  | 0      |
| sd                                    | 0      |
| cov                                   | 0.31   |
| results                               | STABLE |

Report for ID : MW144 and Analyte : PFOA

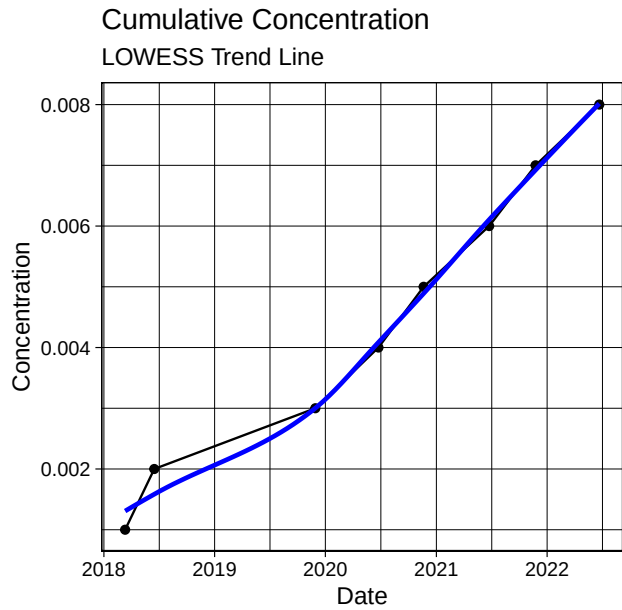
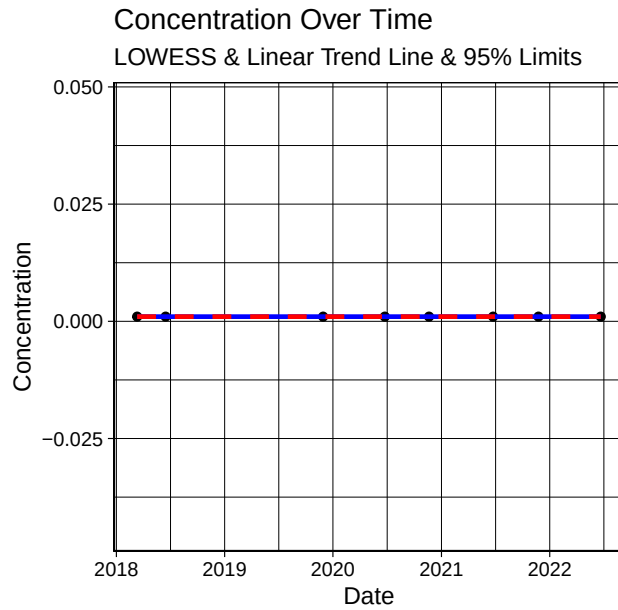


| Kendall Trend Test Results Continuous |     |
|---------------------------------------|-----|
| n                                     | 8   |
| z                                     | NaN |
| p                                     | NaN |
| S                                     | 0   |
| varS                                  | 0   |
| tau                                   | NaN |
| mean                                  | 0   |
| sd                                    | 0   |
| cov                                   | 0   |
| results                               | NA  |

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Report for ID : MW145 and Analyte : PFOA

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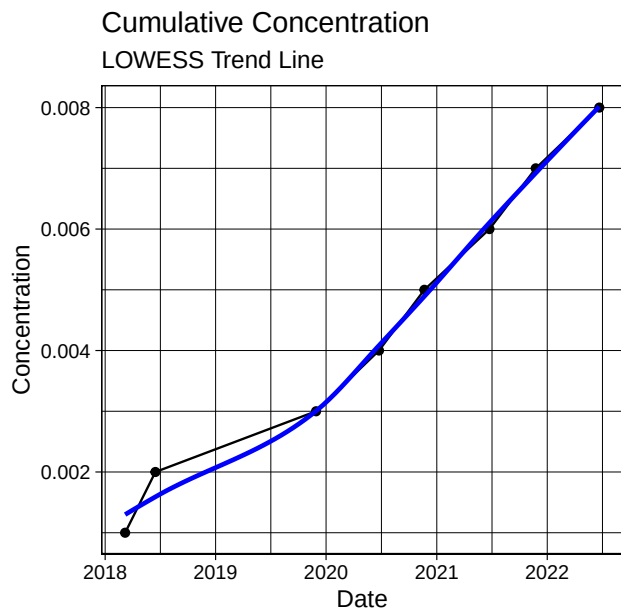
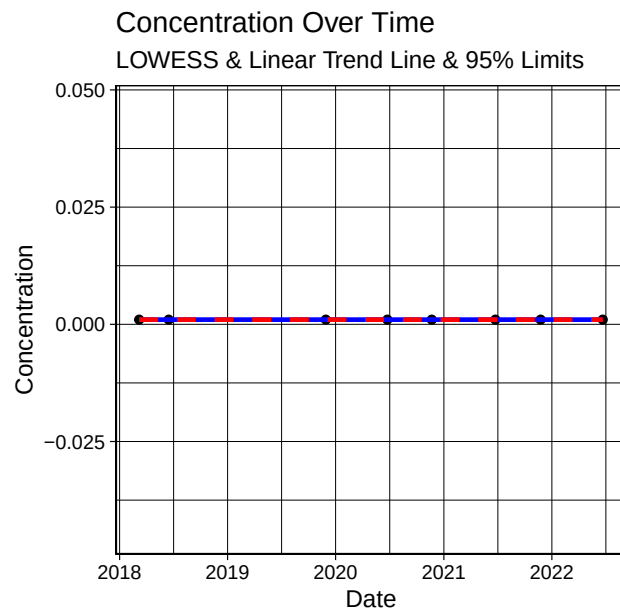


| Kendall Trend Test Results Continuous |     |
|---------------------------------------|-----|
| n                                     | 8   |
| z                                     | NaN |
| p                                     | NaN |
| S                                     | 0   |
| varS                                  | 0   |
| tau                                   | NaN |
| mean                                  | 0   |
| sd                                    | 0   |
| cov                                   | 0   |
| results                               | NA  |

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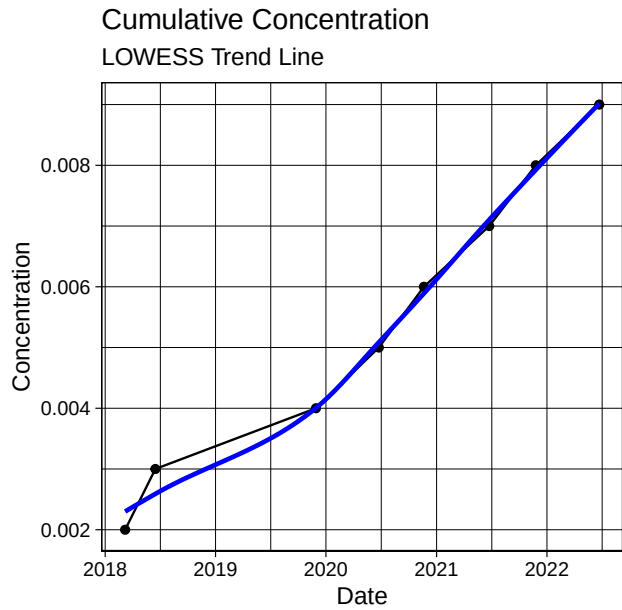
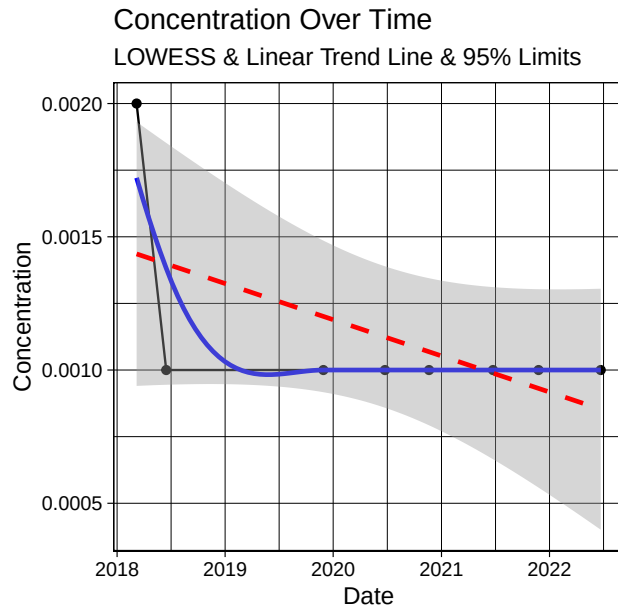
Report for ID : MW146 and Analyte : PFOA

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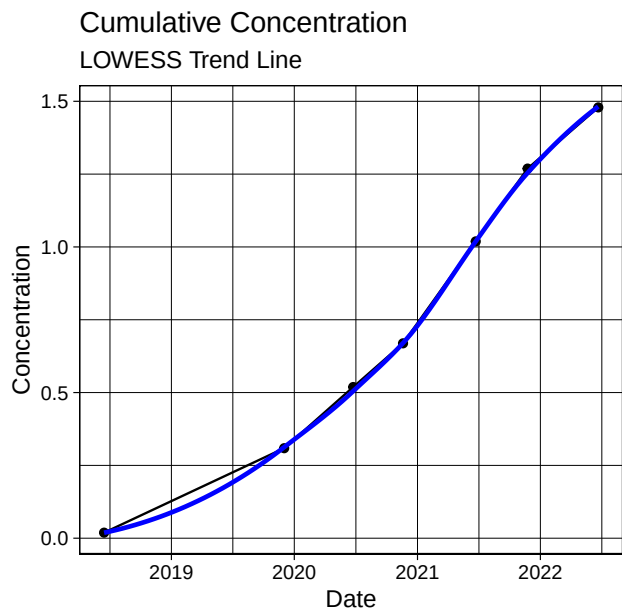
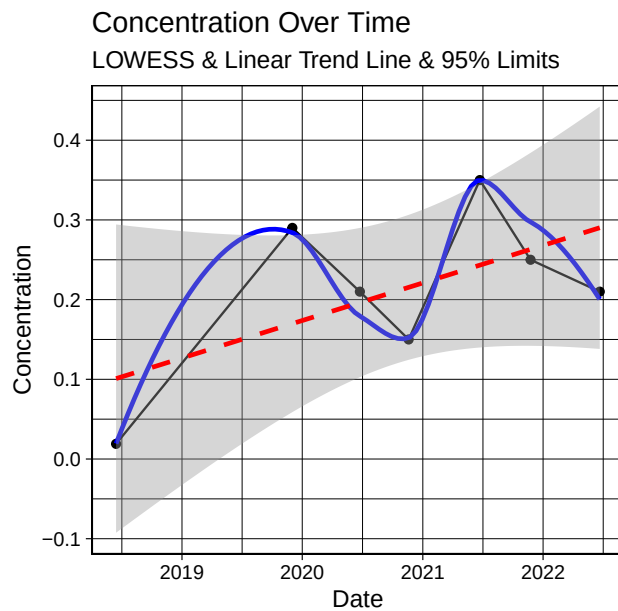
| Kendall Trend Test Results Continuous |        |
|---------------------------------------|--------|
| n                                     | 8      |
| z                                     | -1.31  |
| p                                     | 0.19   |
| S                                     | -7     |
| varS                                  | 21     |
| tau                                   | -0.5   |
| mean                                  | 0      |
| sd                                    | 0      |
| cov                                   | 0.31   |
| results                               | STABLE |

Report for ID : MW147 and Analyte : PFOA



| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 7              |
| z                                     | 0.46           |
| p                                     | 0.65           |
| S                                     | 4              |
| varS                                  | 43.33          |
| tau                                   | 0.2            |
| mean                                  | 0.21           |
| sd                                    | 0.11           |
| cov                                   | 0.5            |
| results                               | NO CLEAR TREND |

Report for ID : MW148D and Analyte : PFOA

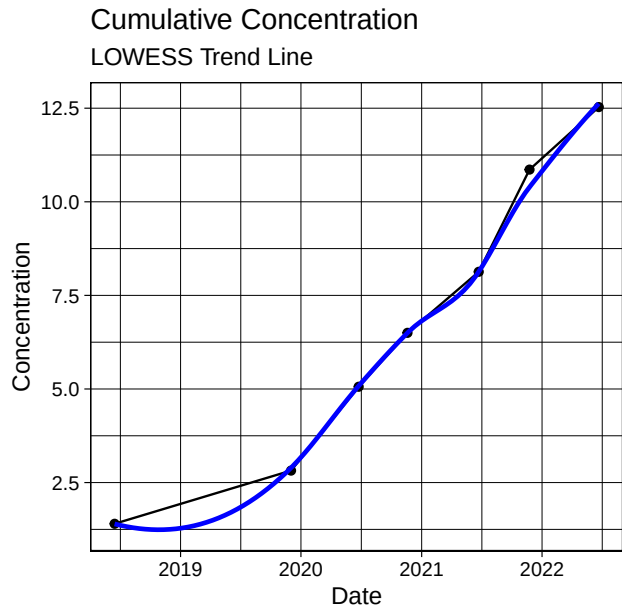
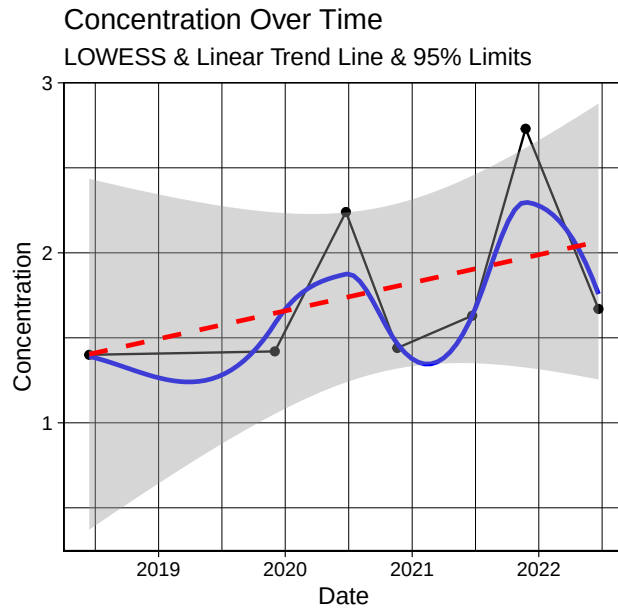


| Kendall Trend Test Results Continuous |                     |
|---------------------------------------|---------------------|
| n                                     | 7                   |
| z                                     | 1.8                 |
| p                                     | 0.07                |
| S                                     | 13                  |
| varS                                  | 44.33               |
| tau                                   | 0.62                |
| mean                                  | 1.79                |
| sd                                    | 0.51                |
| cov                                   | 0.28                |
| results                               | POSSIBLY INCREASING |

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Report for ID : MW148S and Analyte : PFOA

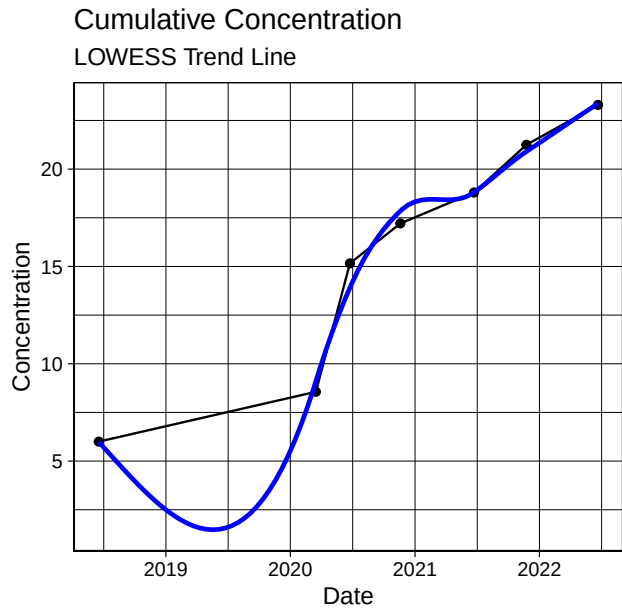
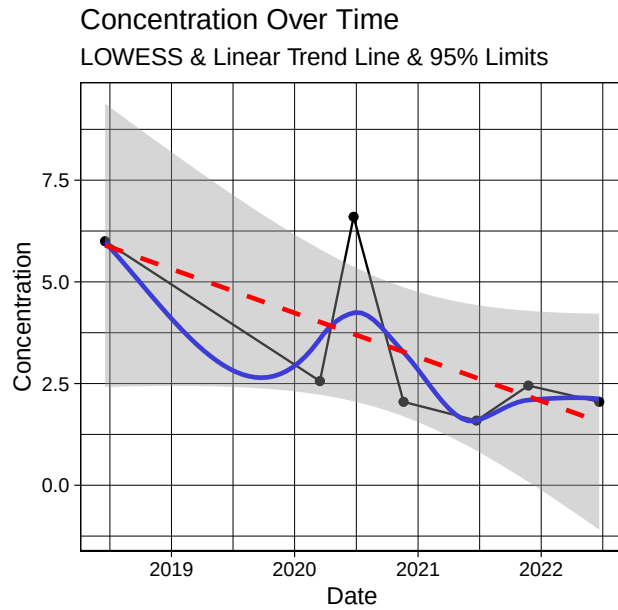
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| Kendall Trend Test Results Continuous |        |
|---------------------------------------|--------|
| n                                     | 7      |
| z                                     | -1.37  |
| p                                     | 0.17   |
| S                                     | -10    |
| varS                                  | 43.33  |
| tau                                   | -0.49  |
| mean                                  | 3.33   |
| sd                                    | 2.06   |
| cov                                   | 0.62   |
| results                               | STABLE |

Report for ID : MW151 and Analyte : PFOA

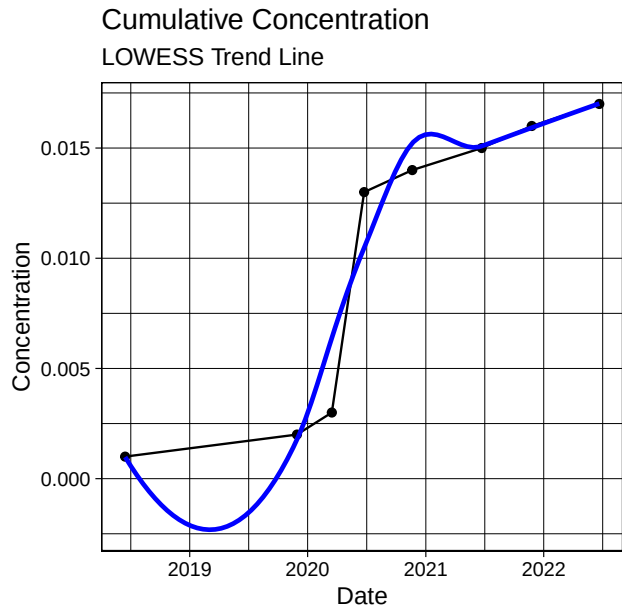
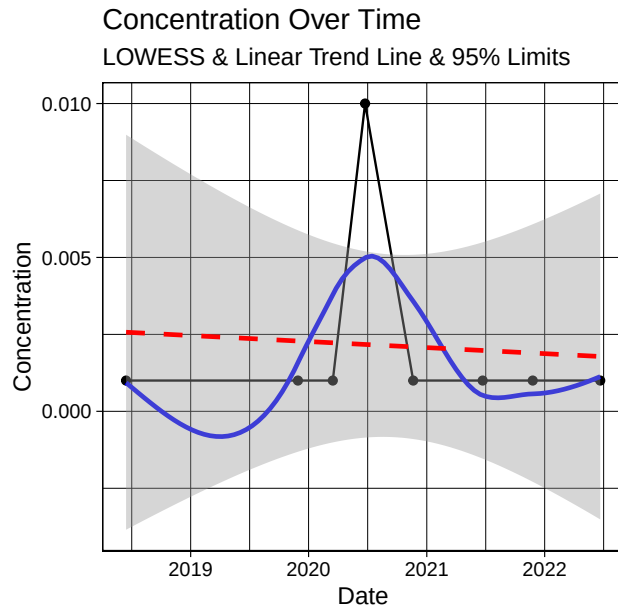


| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 8              |
| z                                     | 0              |
| p                                     | 1              |
| S                                     | -1             |
| varS                                  | 21             |
| tau                                   | -0.07          |
| mean                                  | 0              |
| sd                                    | 0              |
| cov                                   | 1.5            |
| results                               | NO CLEAR TREND |

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Report for ID : MW159 and Analyte : PFOA

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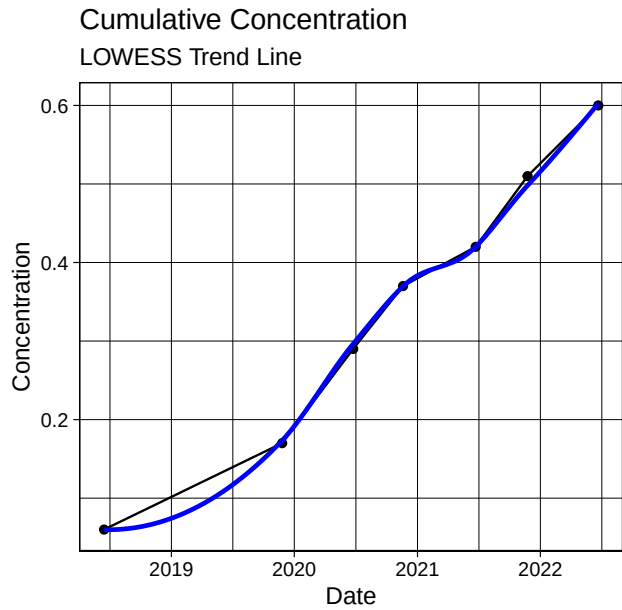
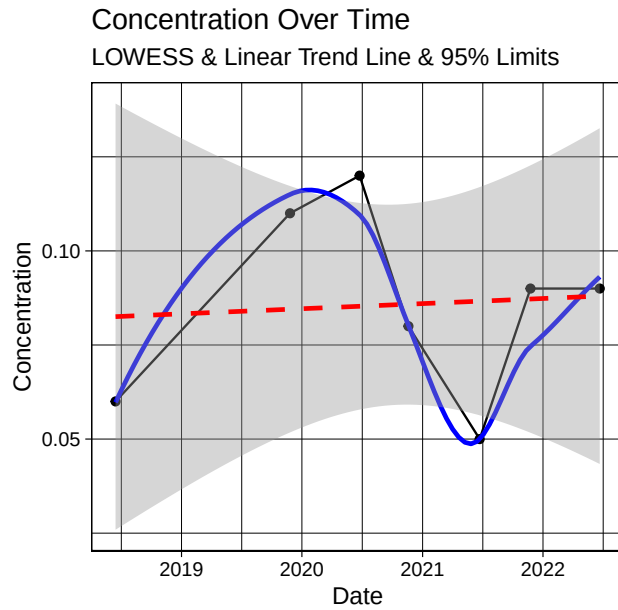


| Kendall Trend Test Results Continuous |        |
|---------------------------------------|--------|
| n                                     | 7      |
| z                                     | 0      |
| p                                     | 1      |
| S                                     | 0      |
| varS                                  | 43.33  |
| tau                                   | 0      |
| mean                                  | 0.09   |
| sd                                    | 0.03   |
| cov                                   | 0.29   |
| results                               | STABLE |

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Report for ID : MW162 and Analyte : PFOA

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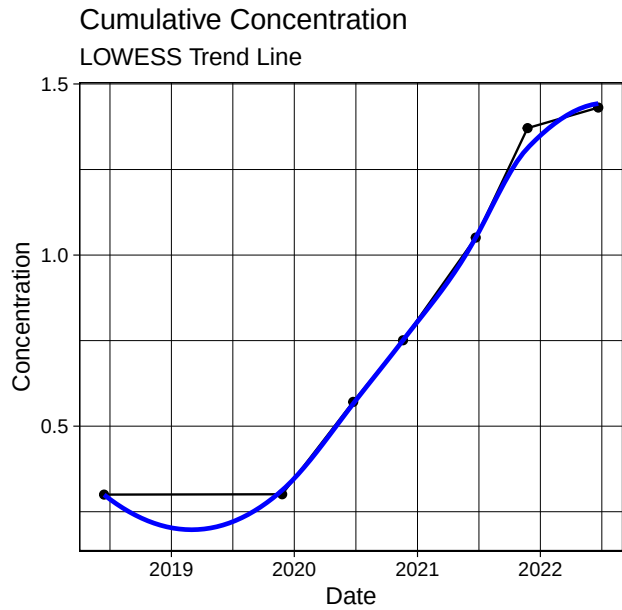
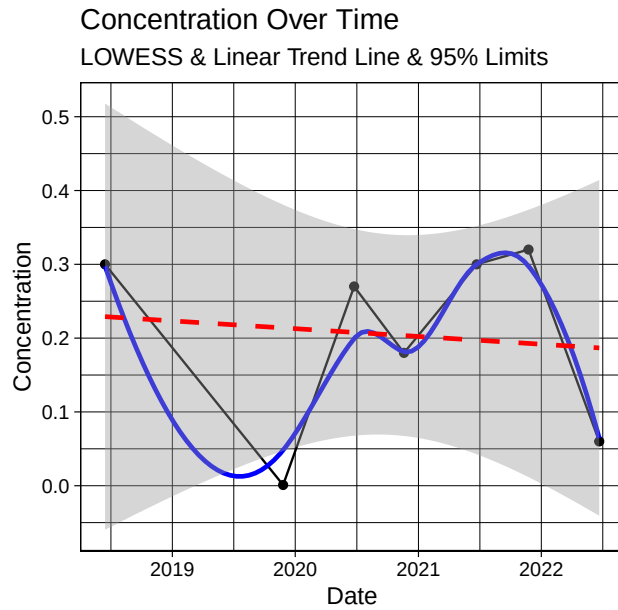


| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 7              |
| z                                     | 0.15           |
| p                                     | 0.88           |
| S                                     | 2              |
| varS                                  | 43.33          |
| tau                                   | 0.1            |
| mean                                  | 0.2            |
| sd                                    | 0.13           |
| cov                                   | 0.63           |
| results                               | NO CLEAR TREND |

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Report for ID : MW163 and Analyte : PFOA

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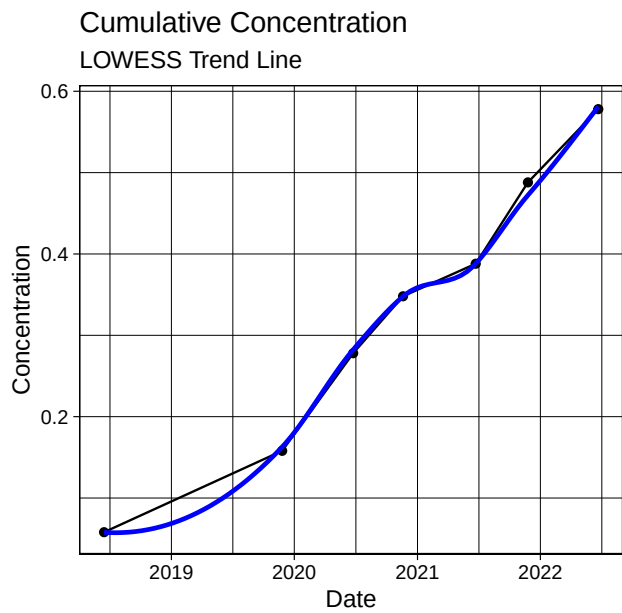
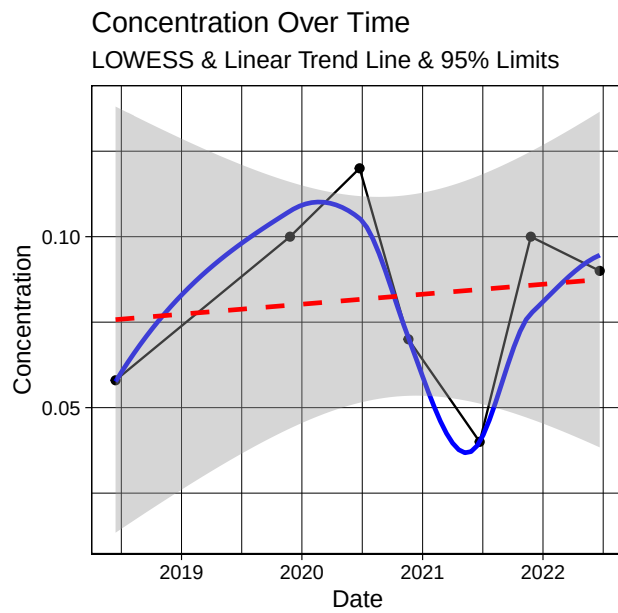


| Kendall Trend Test Results Continuous |        |
|---------------------------------------|--------|
| n                                     | 7      |
| z                                     | 0      |
| p                                     | 1      |
| S                                     | 0      |
| varS                                  | 43.33  |
| tau                                   | 0      |
| mean                                  | 0.08   |
| sd                                    | 0.03   |
| cov                                   | 0.34   |
| results                               | STABLE |

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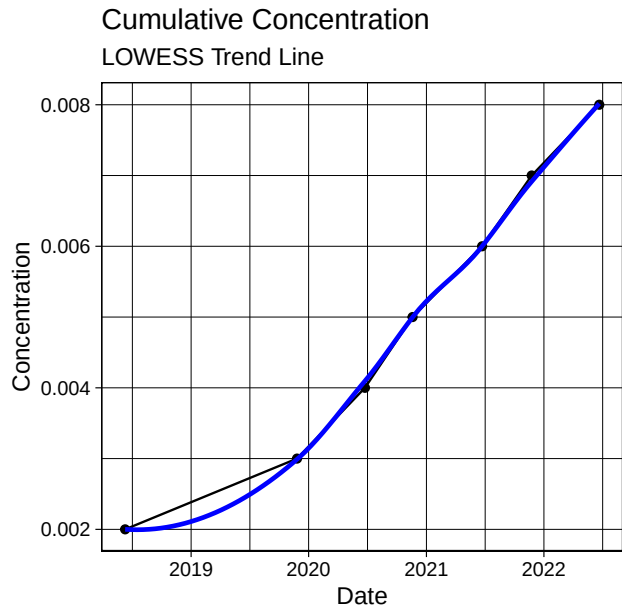
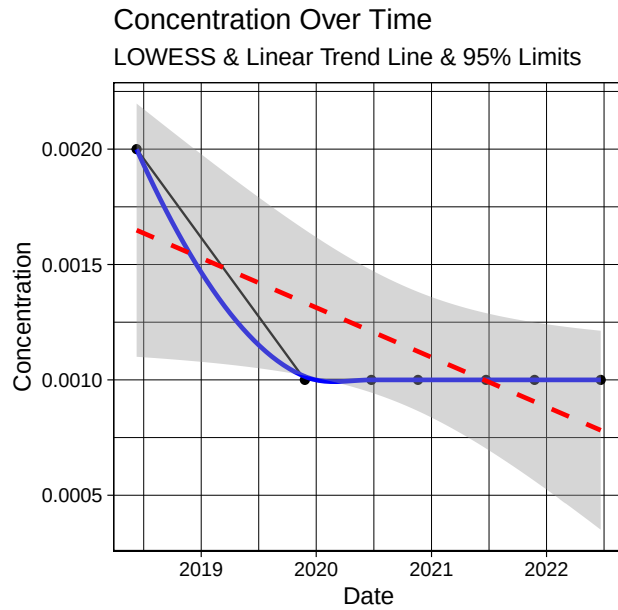
Report for ID : MW164 and Analyte : PFOA

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| Kendall Trend Test Results Continuous |        |
|---------------------------------------|--------|
| n                                     | 7      |
| z                                     | -1.25  |
| p                                     | 0.21   |
| S                                     | -6     |
| varS                                  | 16     |
| tau                                   | -0.53  |
| mean                                  | 0      |
| sd                                    | 0      |
| cov                                   | 0.33   |
| results                               | STABLE |

Report for ID : MW165 and Analyte : PFOA

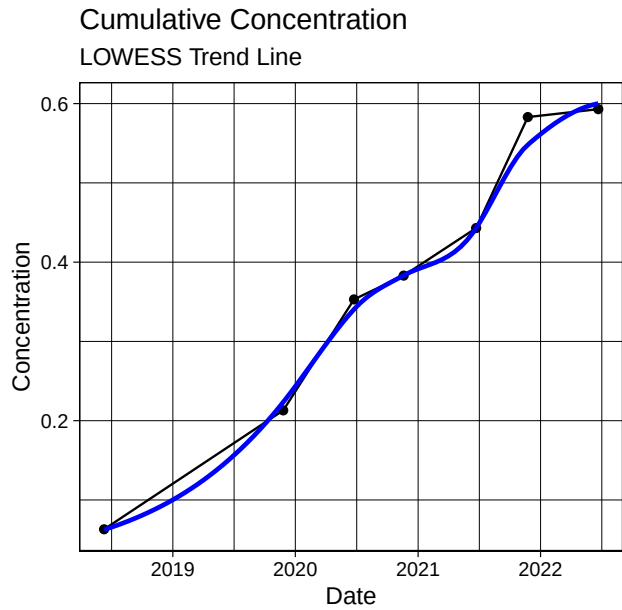
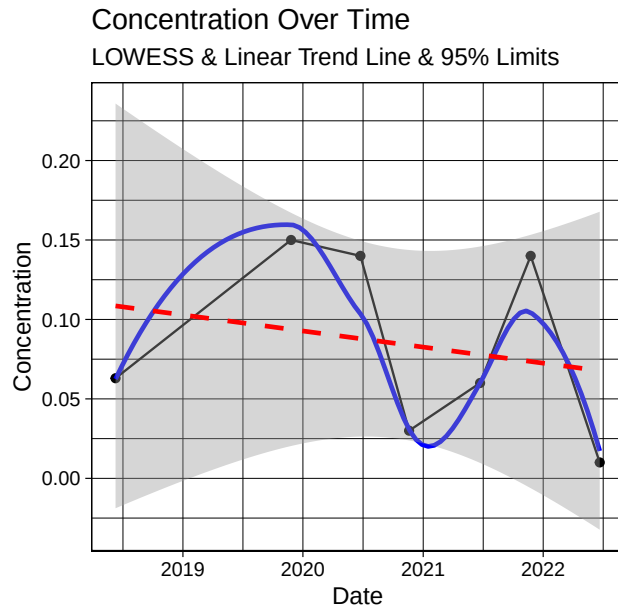


| Kendall Trend Test Results Continuous |        |
|---------------------------------------|--------|
| n                                     | 7      |
| z                                     | -1.06  |
| p                                     | 0.29   |
| S                                     | -8     |
| varS                                  | 43.33  |
| tau                                   | -0.39  |
| mean                                  | 0.08   |
| sd                                    | 0.06   |
| cov                                   | 0.68   |
| results                               | STABLE |

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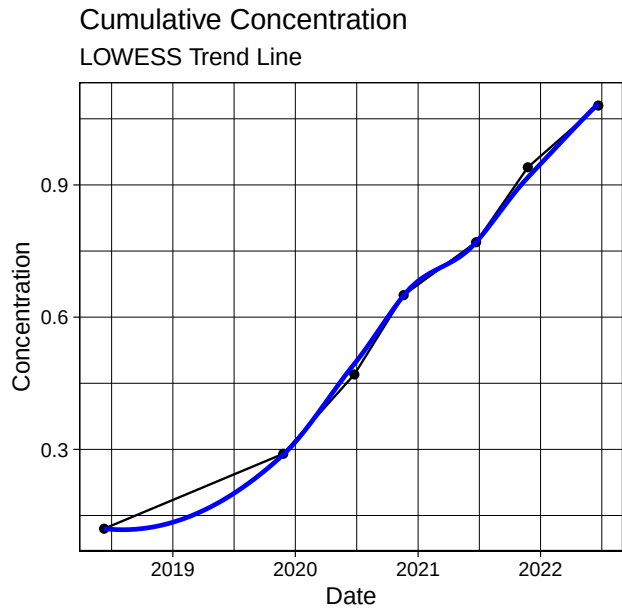
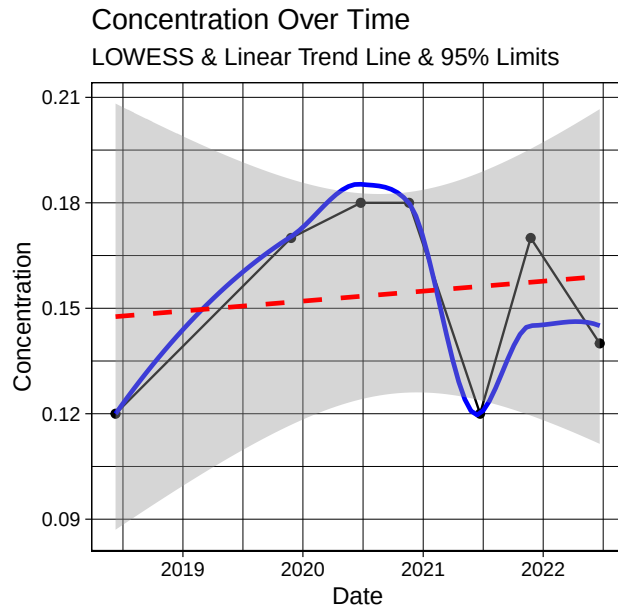
Report for ID : MW166 and Analyte : PFOA

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| Kendall Trend Test Results Continuous |        |
|---------------------------------------|--------|
| n                                     | 7      |
| z                                     | 0      |
| p                                     | 1      |
| S                                     | 0      |
| varS                                  | 41.33  |
| tau                                   | 0      |
| mean                                  | 0.15   |
| sd                                    | 0.03   |
| cov                                   | 0.17   |
| results                               | STABLE |

Report for ID : MW167 and Analyte : PFOA



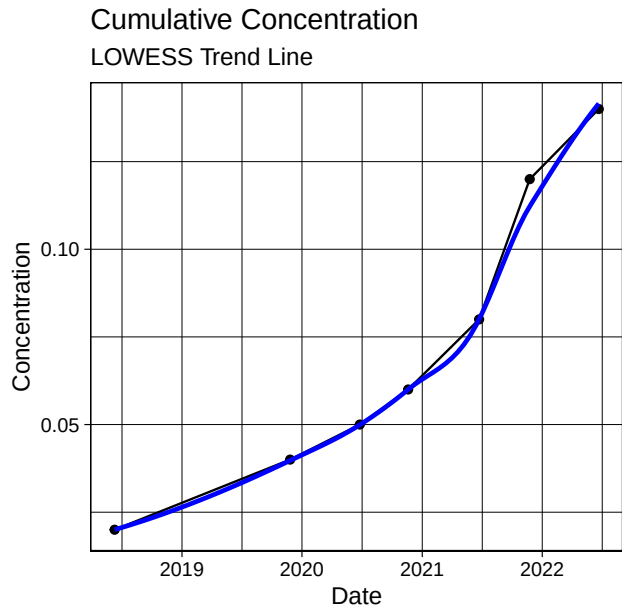
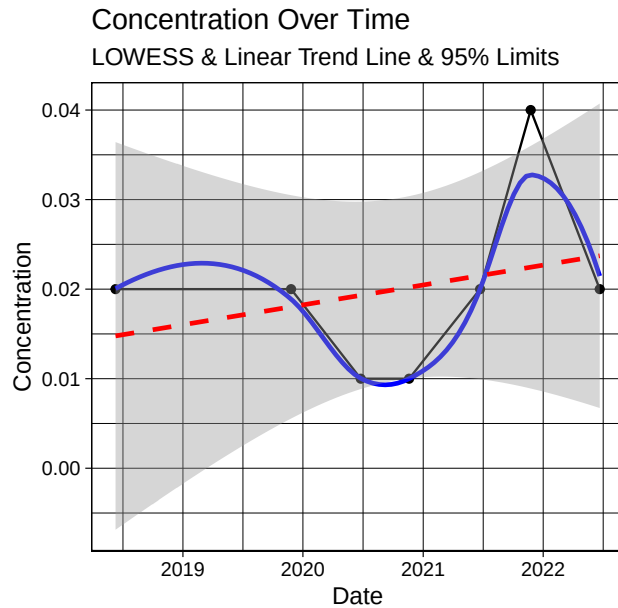


| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 7              |
| z                                     | 0.51           |
| p                                     | 0.61           |
| S                                     | 4              |
| varS                                  | 34.67          |
| tau                                   | 0.23           |
| mean                                  | 0.02           |
| sd                                    | 0.01           |
| cov                                   | 0.5            |
| results                               | NO CLEAR TREND |

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Report for ID : MW168 and Analyte : PFOA

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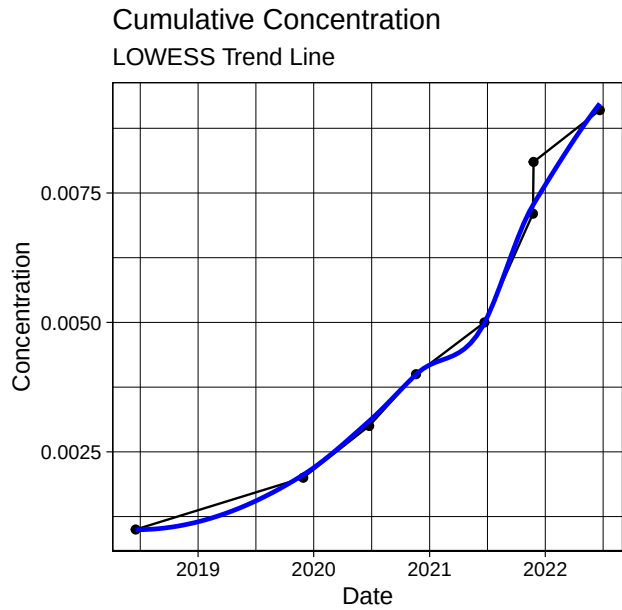
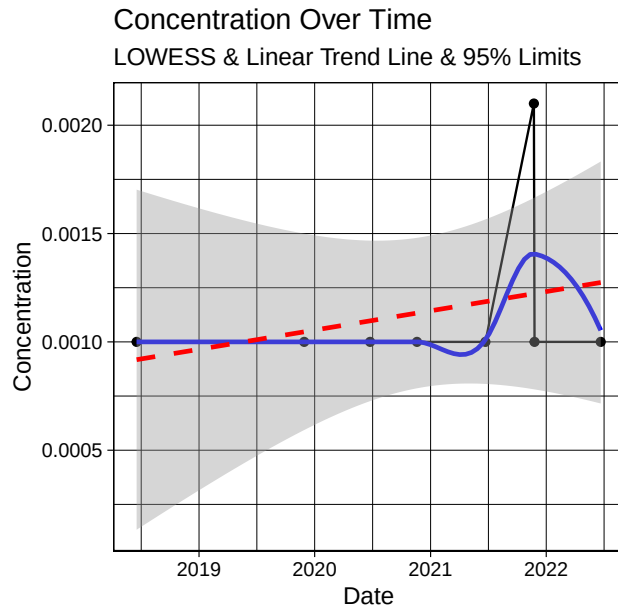


| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 8              |
| z                                     | 0.44           |
| p                                     | 0.66           |
| S                                     | 3              |
| varS                                  | 21             |
| tau                                   | 0.21           |
| mean                                  | 0              |
| sd                                    | 0              |
| cov                                   | 0.34           |
| results                               | NO CLEAR TREND |

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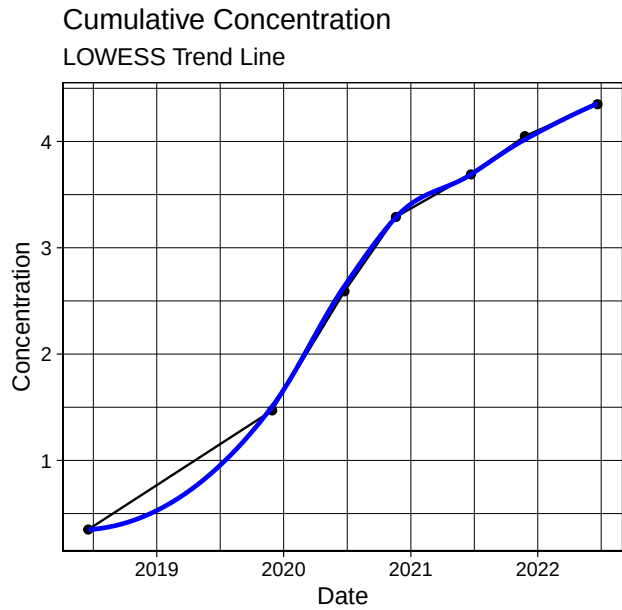
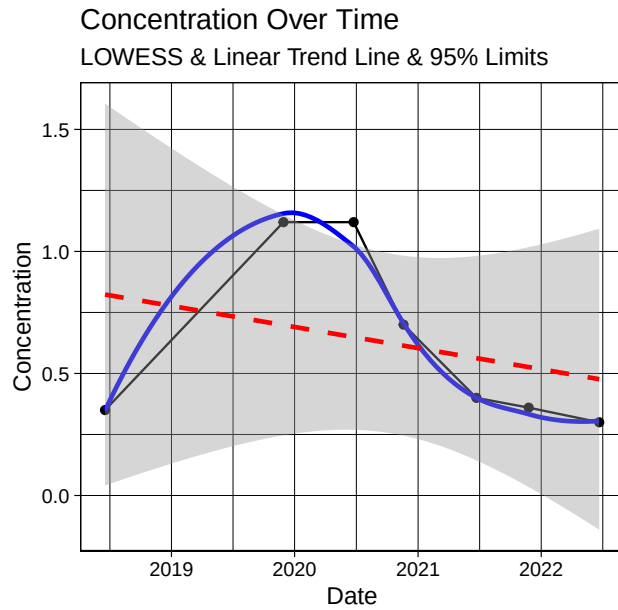
Report for ID : MW170 and Analyte : PFOA

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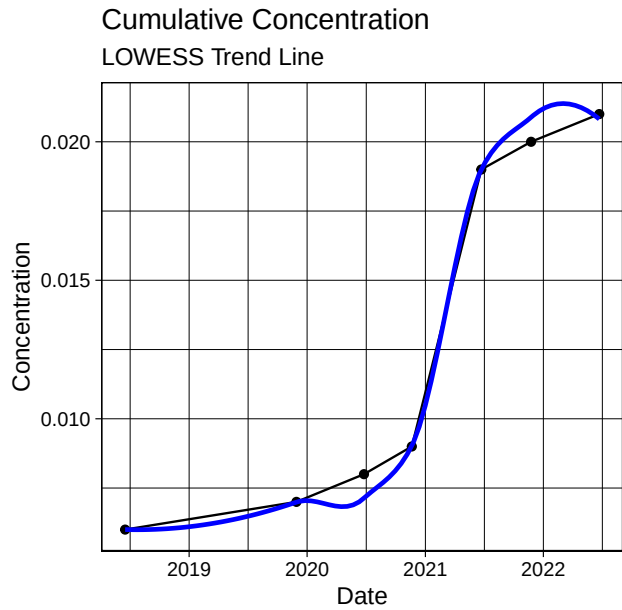
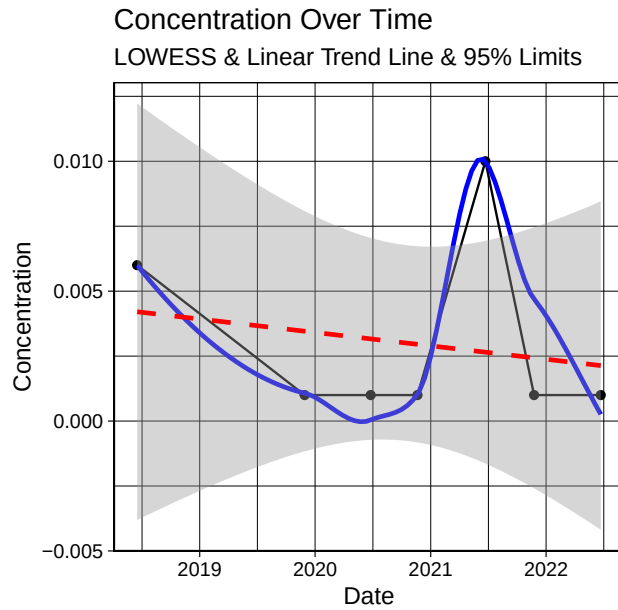
| Kendall Trend Test Results Continuous |        |
|---------------------------------------|--------|
| n                                     | 7      |
| z                                     | -1.37  |
| p                                     | 0.17   |
| S                                     | -10    |
| varS                                  | 43.33  |
| tau                                   | -0.49  |
| mean                                  | 0.62   |
| sd                                    | 0.36   |
| cov                                   | 0.59   |
| results                               | STABLE |

Report for ID : MW172 and Analyte : PFOA



| Kendall Trend Test Results Continuous |                |
|---------------------------------------|----------------|
| n                                     | 7              |
| z                                     | -0.38          |
| p                                     | 0.7            |
| S                                     | -3             |
| varS                                  | 27.67          |
| tau                                   | -0.2           |
| mean                                  | 0              |
| sd                                    | 0              |
| cov                                   | 1.2            |
| results                               | NO CLEAR TREND |

Report for ID : MW175 and Analyte : PFOA

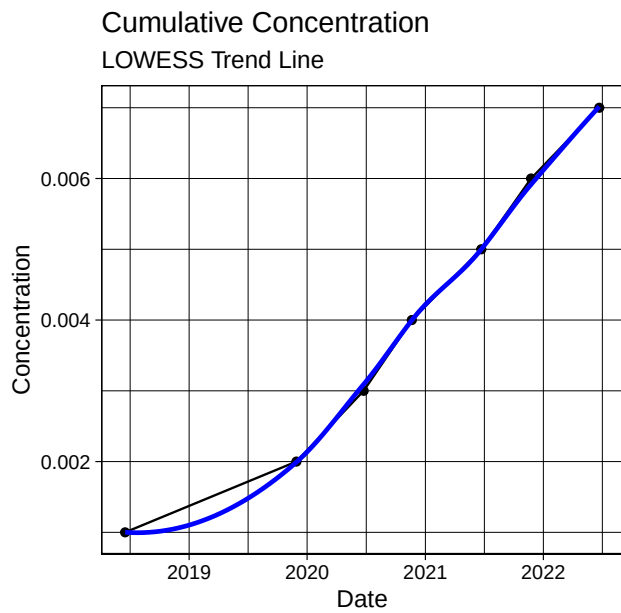
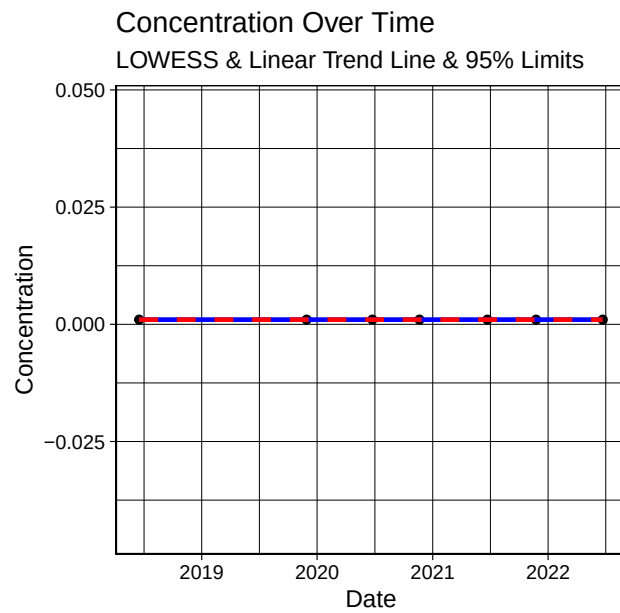


| Kendall Trend Test Results Continuous |     |
|---------------------------------------|-----|
| n                                     | 7   |
| z                                     | NaN |
| p                                     | NaN |
| S                                     | 0   |
| varS                                  | 0   |
| tau                                   | NaN |
| mean                                  | 0   |
| sd                                    | 0   |
| cov                                   | 0   |
| results                               | NA  |

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Report for ID : MW176 and Analyte : PFOA

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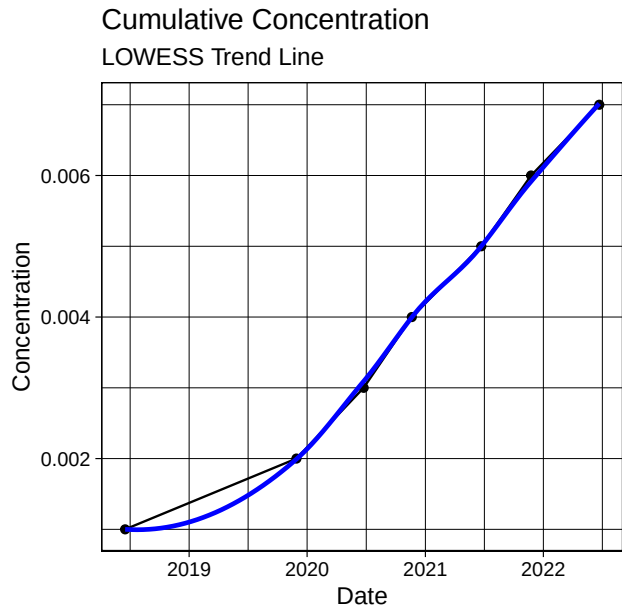
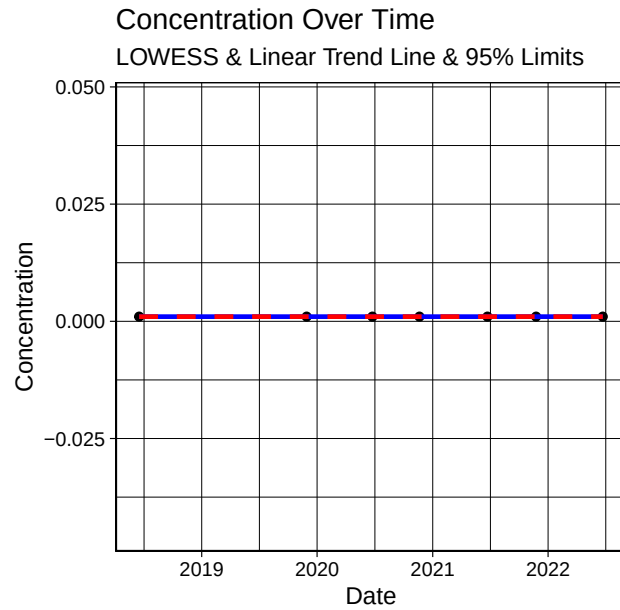


| Kendall Trend Test Results Continuous |     |
|---------------------------------------|-----|
| n                                     | 7   |
| z                                     | NaN |
| p                                     | NaN |
| S                                     | 0   |
| varS                                  | 0   |
| tau                                   | NaN |
| mean                                  | 0   |
| sd                                    | 0   |
| cov                                   | 0   |
| results                               | NA  |

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Report for ID : MW177 and Analyte : PFOA

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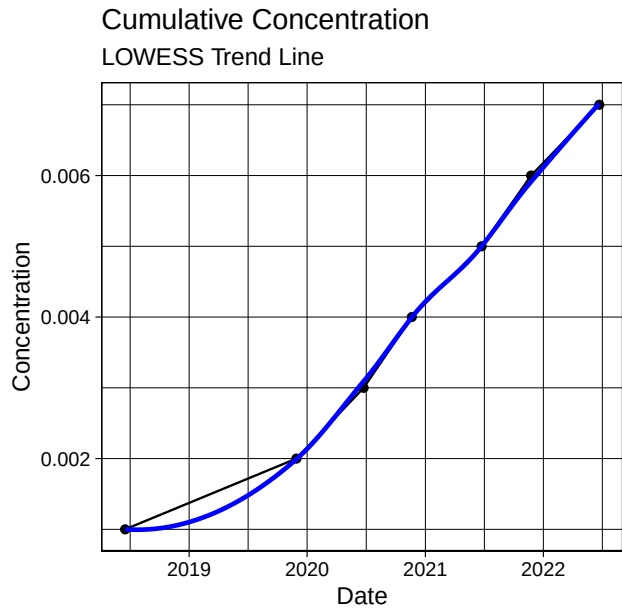
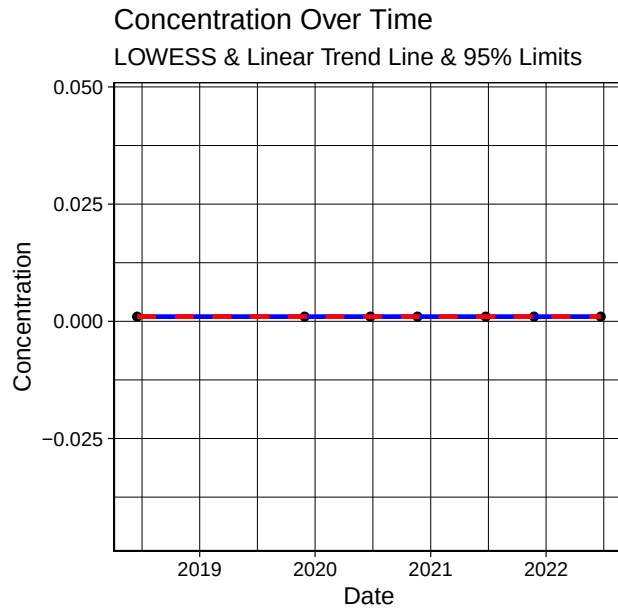


| Kendall Trend Test Results Continuous |     |
|---------------------------------------|-----|
| n                                     | 7   |
| z                                     | NaN |
| p                                     | NaN |
| S                                     | 0   |
| varS                                  | 0   |
| tau                                   | NaN |
| mean                                  | 0   |
| sd                                    | 0   |
| cov                                   | 0   |
| results                               | NA  |

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Report for ID : MW178 and Analyte : PFOA

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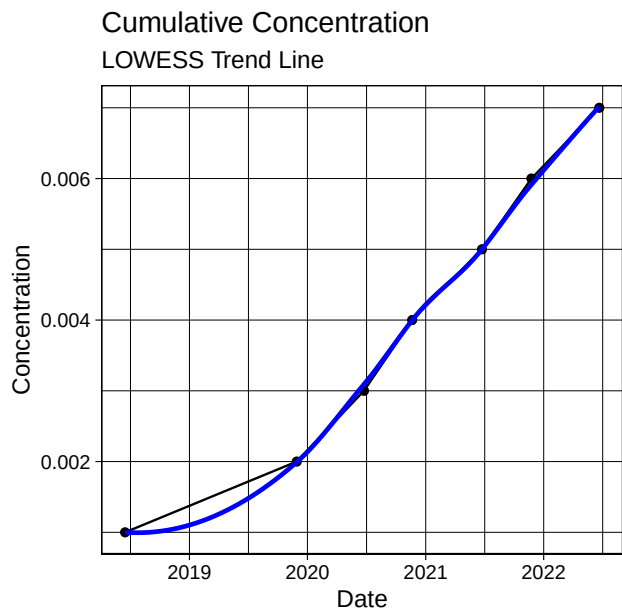
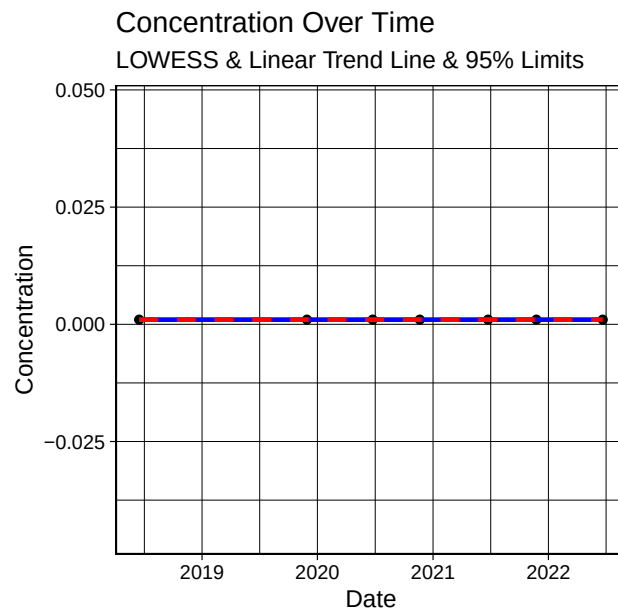


| Kendall Trend Test Results Continuous |     |
|---------------------------------------|-----|
| n                                     | 7   |
| z                                     | NaN |
| p                                     | NaN |
| S                                     | 0   |
| varS                                  | 0   |
| tau                                   | NaN |
| mean                                  | 0   |
| sd                                    | 0   |
| cov                                   | 0   |
| results                               | NA  |

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Report for ID : MW179 and Analyte : PFOA

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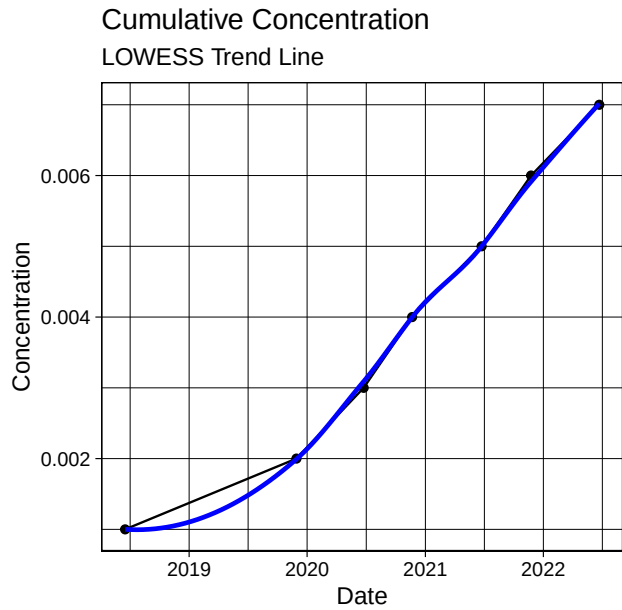
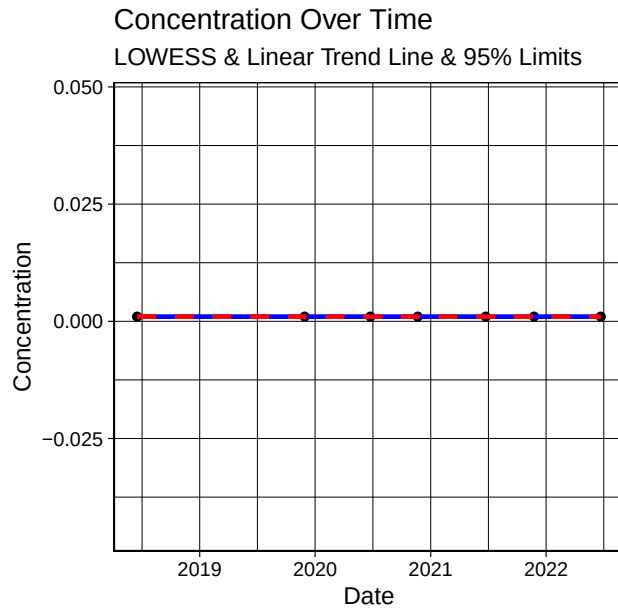


| Kendall Trend Test Results Continuous |     |
|---------------------------------------|-----|
| n                                     | 7   |
| z                                     | NaN |
| p                                     | NaN |
| S                                     | 0   |
| varS                                  | 0   |
| tau                                   | NaN |
| mean                                  | 0   |
| sd                                    | 0   |
| cov                                   | 0   |
| results                               | NA  |

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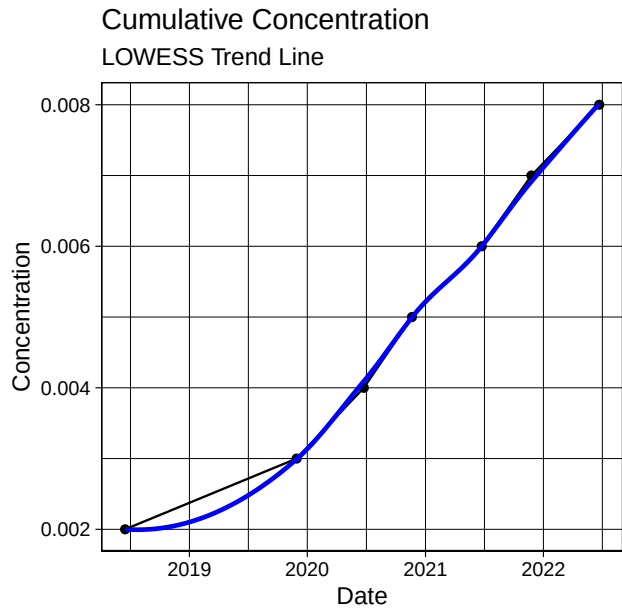
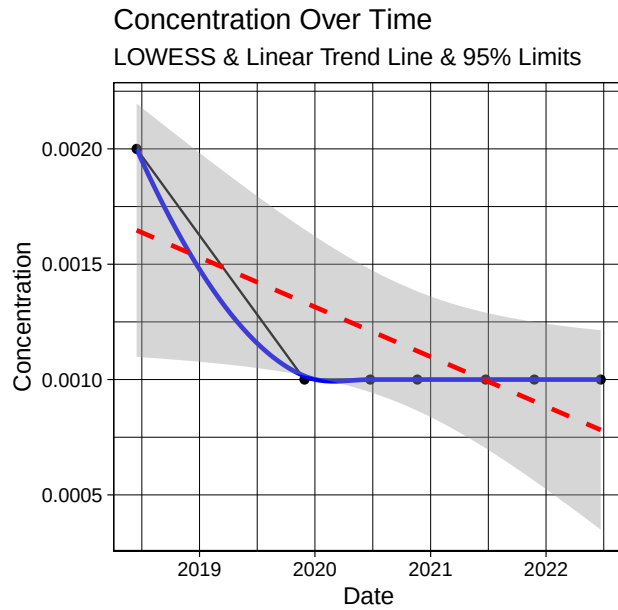
Report for ID : MW180 and Analyte : PFOA

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| Kendall Trend Test Results Continuous |        |
|---------------------------------------|--------|
| n                                     | 7      |
| z                                     | -1.25  |
| p                                     | 0.21   |
| S                                     | -6     |
| varS                                  | 16     |
| tau                                   | -0.53  |
| mean                                  | 0      |
| sd                                    | 0      |
| cov                                   | 0.33   |
| results                               | STABLE |

Report for ID : MW181 and Analyte : PFOA

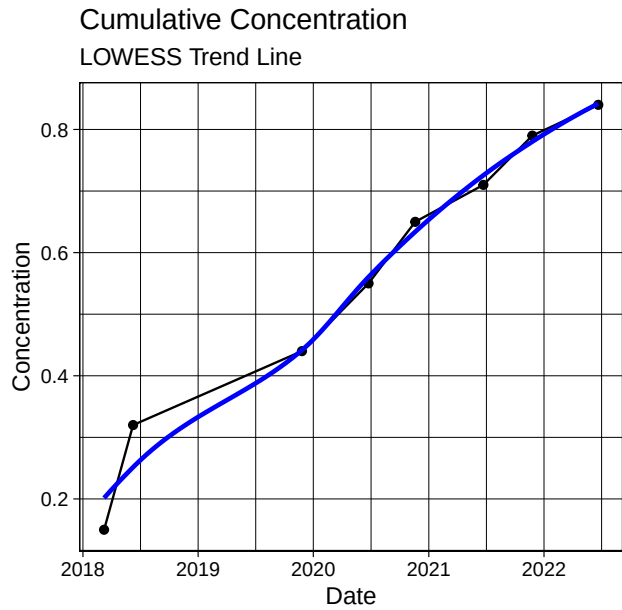
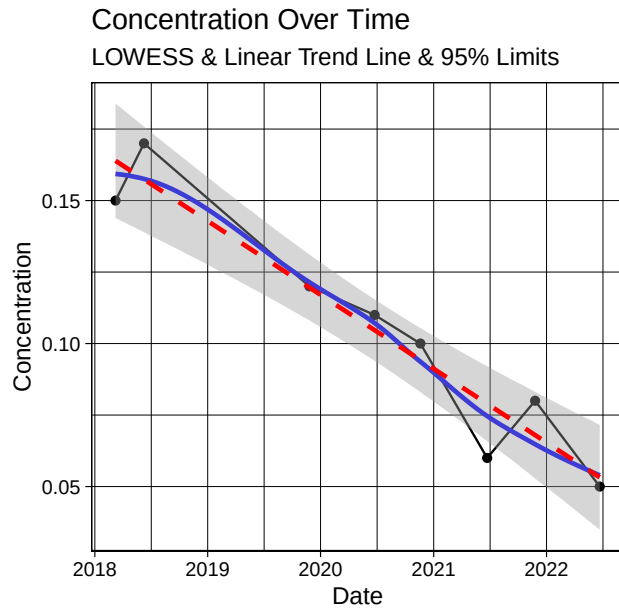


| Kendall Trend Test Results Continuous |            |
|---------------------------------------|------------|
| n                                     | 8          |
| z                                     | -2.85      |
| p                                     | 0          |
| S                                     | -24        |
| varS                                  | 65.33      |
| tau                                   | -0.86      |
| mean                                  | 0.1        |
| sd                                    | 0.04       |
| cov                                   | 0.4        |
| results                               | DECREASING |

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Report for ID : MW211 and Analyte : PFOA

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| Kendall Trend Test Results Continuous |        |
|---------------------------------------|--------|
| n                                     | 9      |
| z                                     | -1.05  |
| p                                     | 0.29   |
| S                                     | -11    |
| varS                                  | 91     |
| tau                                   | -0.31  |
| mean                                  | 0.41   |
| sd                                    | 0.21   |
| cov                                   | 0.52   |
| results                               | STABLE |

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Report for ID : MW233 and Analyte : PFOA

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