



Fire and Rescue NSW

Additional monitoring Deniliquin

November 2019

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1. Introduction

Fire and Rescue NSW (FRNSW) engaged GHD Pty Ltd (GHD) to undertake additional environmental monitoring at the FRNSW training facility located at Macknight Drive, Deniliquin (lot 48 of DP1189132), (the site) as well as a number of locations on neighbouring properties (the investigation area). The site boundaries are indicated in Figure 1 of Appendix A.

1.1 Site background

The site serves as a training facility for fire fighters, which has included the historical use of aqueous film forming foam (AFFF), which potentially contained per- and poly-fluoroalkyl substances (PFAS), including perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA), and perfluorohexane sulfonate (PFHxS).

The NSW Environment Protection Authority (NSW EPA) is leading an investigation programme to assess the legacy use of PFAS across NSW (NSW EPA, 2019). In 2016, the NSW EPA requested FRNSW undertake further investigation at the site to understand the potential for PFAS contamination.

A preliminary site investigation (PSI) was undertaken by GHD in 2016 (GHD, 2016) to identify potential sources of contamination and areas of potential concern. Findings of the PSI included identification of a number of source areas (e.g. areas where AFFF was used during training, and wash-down areas for contaminated equipment), potential exposure pathways, and potential human and ecological receptors.

Following completion of the PSI, an environmental site assessment (ESA) was undertaken by GHD between November 2016 and January 2017 (GHD, 2017a). A number of groundwater wells were installed, facilitating soil sampling, and subsequent groundwater, sediment, and surface water sampling was undertaken. Findings of the ESA included that soils and sediments at the FRNSW training facility have the potential to release PFAS to the environment, as indicated by leachability testing. PFAS was detected in off-site sediment samples, indicating that PFAS was likely to be migrating off-site via the man-made surface water drainage network in the area. The site was subsequently classified as a priority 1 site based on detections of PFAS in soil and surface water at concentrations exceeding trigger values, based on the EnRisk (2016) decision tree for prioritisation.

A phase 2 ESA was undertaken by GHD between May and June 2017 (GHD, 2017b). During this phase of works, three additional groundwater wells were installed both on the FRNSW training facility grounds (MW04) and on the surrounding land (MW05 and MW06). Sampling of soil, surface water, sediment, and groundwater was undertaken both on and off the FRNSW training facility grounds. Findings included that contamination was present at the site from historical use of AFFF products containing PFAS, and that although the primary sources of PFAS were no longer present, secondary sources included soil, sediment in surface water drainage channels, and surface water. Exceedances of assessment criteria in soil and groundwater were generally localised to the training facility.

1.2 Objective

The objective of this stage of works is to obtain current monitoring data which can then be used to inform PFAS trend analysis and refine the conceptual site model (CSM).

1.3 Scope

The scope of works undertaken to meet the investigation objectives were:

- Collection of samples from nominated sampling points
- Implementation of quality assurance (QA) and quality control (QC) procedures, including the collection of appropriate QA samples
- Preparation of this summary report, documenting the results of the monitoring event, including review of the existing data set and trend analysis, where appropriate
- Update the CSM, where appropriate

The works were undertaken in conjunction with a land and water use survey of surrounding properties to further inform the CSM. The findings of the land and water use survey are reported in GHD (2019a).

1.4 Limitations

This report: has been prepared by GHD for Fire and Rescue NSW and may only be used and relied on by Fire and Rescue NSW for the purpose agreed between GHD and the Fire and Rescue NSW as set out in section 1.2 of this report.

GHD otherwise disclaims responsibility to any person other than Fire and Rescue NSW arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

The opinions, conclusions and any recommendations in this report are based on information obtained from, and testing undertaken at or in connection with, specific sample points. Site conditions at other parts of the site may be different from the site conditions found at the specific sample points.

Investigations undertaken in respect of this report are constrained by the particular site conditions, such as the location of buildings, services and vegetation. As a result, not all relevant site features and conditions may have been identified in this report.

Site conditions (including the presence of hazardous substances and/or site contamination) may change after the date of this Report. GHD does not accept responsibility arising from, or in connection with, any change to the site conditions. GHD is also not responsible for updating this report if the site conditions change.

2. Site Setting

2.1 Site identification

A summary of FRNSW site identification details are provided in Table 1. The site location is presented in Figure 1 in Appendix A

Table 1 FRNSW Training Facility identification summary

Information	Details
Street address	Macknight Drive, Deniliquin, NSW 2710
Lot and DP number	Lot 48 of deposit plan 1189132
Site area	Approximately 23,000 m ² with a perimeter of approximately 610 m
Local government area	Deniliquin Council
Local land use zoning	IN1 – General Industrial
Current land use	Training facility
Ownership	The site is owned by Deniliquin Council and is leased by FRNSW for use as a training facility. The lease area has been occupied by FRNSW since 1996.

2.2 Surrounding land use

The surrounding land uses and local environment are summarised in Table 2-2 below.

Table 2 Summary of surrounding land use and local environment

Element	Description
Surrounding land use	Various properties including vacant land and some industrial / commercial properties to the north that are zoned as 'General Industrial (IN1)' or 'Infrastructure (SP2)'. Deniliquin Airport surrounds the site to the east, south and west, and is zoned as Infrastructure: Air Transport Facilities.
Topography	The regional topography appears to be mostly flat, with a slight fall from south-east to north-west. The investigation area lies approximately 96 metres Australian Height Datum (mAHD) and is relatively flat, except for some artificial grading around a former pool area.
Soils	The site is within the brown Chromosols landscape. The brown Chromosols landscape is found in sites with average rainfall between 0.35 m and 1.4 m. The soils have moderate agricultural potential, chemical fertility and soil drainage. The upper horizons are described as dark brown with up to 10% orange mottles, silty clay loam, grading into a dark brown medium heavy clay. There is a low probability of encountering acid sulphate containing soils.

2.3 Geology

The 1:250,000 scale Deniliquin geological map indicated the site is situated on the Shepparton Formation (Brown & Stephenson, 1991). The Shepparton Formation is described as unconsolidated to poorly consolidated, mottled, variegated clay, silty clay with lenses of polymictic, coarse to fine sand and gravel; partly modified by pedogenesis, includes intercalated red-brown palaeosols.

The presence of clays to approximately 14 m has been confirmed through previous site investigations (GHD, 2017b) and through bore logs from registered bores within the local area.

2.4 Hydrogeology

2.4.1 Groundwater aquifers

The site is located on Quaternary aged, Shepparton Formation, which is expected to form the primary water bearing aquifer unit in this area. According to the Deniliquin 1:250,000 scale Hydrogeological Map (Brown & Stephenson, 1991), the total dissolved solids (TDS) in the groundwater beneath the site is likely to be in the order of 1000 to 1500 mg/L, indicating it would be suitable for stock, domestic and some irrigation purposes. Additionally, bore yields were shown to be 0.5-5 L/s within the sand aquifer, with hydraulic conductivities between 5 to 10 m/day.

Groundwater quality parameters obtained during sampling undertaken in July 2019 indicated salinity ranging between 1574 and 11,445 $\mu\text{S}/\text{cm}$ for bores located on and in the vicinity of the site, as detailed in Table 10. Salinity was above the stock water criteria (ANZECC, 2000) in MW04 onsite, and MW06, GW503702 and GW503704 offsite. Salinity was also within the *Australian Drinking Water Guidelines 6 2011* (NHMRC & NRMCC, 2018) ranges for 'poor quality' to 'unacceptable'. Assessment against these criteria indicates that shallow groundwater is of limited beneficial use potential in this area. However, fresher water may be located closer to the township of Deniliquin and the Edward River where several production bores are located; these bores are more than 1.7 km east of the site. The bore records for these wells indicate salinities are less than the 1000 mg/L with yields above 1 L/s indicating that the aquifer is potentially of high beneficial use. The large number of wells in and around Edward River used for water supply purposes supports this interpretation.

Groundwater was encountered in monitoring wells between 12.14 and 16.9 metres below the top of casing (mbTOC) during groundwater gauging undertaken in July 2019. Based on this data, groundwater flow is inferred to be towards the north and northwest. The depth to groundwater at the site and the local geology (clays encountered up to 14 mbgl) indicate it is unlikely that groundwater is hydraulically connected to Mulwala Canal, located approximately 800 m to the north of the site. As groundwater is flowing in the general direction of the Edward River (i.e. north to north-west), it is possible that the Edward River is hydraulically connected with groundwater.

2.4.2 Existing groundwater bores

GHD conducted a review of existing groundwater borehole records using the Bureau of Meteorology (2019) *Australian Groundwater Explorer* in July 2017, and again in July 2019. The search was conducted to identify registered groundwater boreholes in close proximity to the site, and to record information such as use and standing water level.

No registered bores were located on the site but two groundwater monitoring bores were identified within a 500 metre radius of the site, located on the adjoining Deniliquin Airport to the east. Conversations with Deniliquin Airport staff indicated that these bores were required by the NSW EPA to enable groundwater monitoring in the vicinity of an evaporation pond on the airport grounds. These bores (GW503702 and GW503704) were purged and sampled during the July 2019 sampling event, with results reported within this document.

No other registered groundwater bores were located within one kilometre of the site. Based on the findings of the land and water use survey completed in conjunction with these works (GHD, 2019a), no groundwater bores are known to be present on properties down-gradient of the site, as discussed further in Section 2.6.

2.5 Hydrology

A constructed irrigation watercourse, Mulwala Canal, runs approximately 800 m to the east and north of the site. It originates at Lake Mulwala (over 130 km to the south-east of the site), and diverts water from the Murray River across the southern Riverina plain to the Edward River at Deniliquin and beyond. The Mulwala canal supplies water to the southern Riverina towns Berrigan and Finley (both up gradient of the site), Bunnaloo and Wakool (down gradient of the site), as well as agricultural properties. The water level in Mulwala Canal is regulated and controlled via Yarrawonga Weir at Lake Mulwala. 'Irrigation season' for VIC and NSW Murray System channels usually extends from mid-August to mid-May, however the water level in the canal is ultimately driven by irrigators' demand for allocated water.

Artificial drainage channels exist on and off-site to direct surface water flows to dams located across the investigation area. Flow directions in drainage channels, based on observations during site inspections, are indicated in Figure 5 of Appendix A.

Surface water originating from the site is expected to enter the drainage channels adjacent to Macknight Drive, eventually discharging to a dam located approximately 200 m to the north-east of the site (i.e. near SW03 and SS07). The water level in this dam was observed to be low, and it appeared that its capacity had been increased recently as there was evidence of spoil adjacent to the dam. It is not known whether this dam overflows during periods of high rainfall; however, concentrations of PFAS above LOR in locations SS15/SW04 and SS08 indicate this may have occurred historically. Water that does not reach this off-site dam is likely to evaporate, or seep into the ground; but is not expected to flow to either the Edward River or Mulwala Canal. However, as the channels are discontinuous and terminate either alongside Macknight Drive or at the dam, stormwater runoff (e.g. from roads) is expected to flow into the drainage channels that run adjacent to roads in the investigation area (i.e. Saleyards Road, Macknight Drive, Cobb Highway).

Drainage channels in the east of the investigation area appear to connect to a channel that flows north along Cobb Highway, appearing to cross Cobb Highway approximately 50 m south of Mulwala Canal before flowing adjacent to the canal for approximately 1800 m and then discharging to it approximately 2.4 km southeast of the site.

The closest natural water body is Aljoes Creek located 2.5 km east of the site and appears to intersect Mulwala Canal approximately 4 km south-east of the site. Aljoes Creek discharges to Edward River located approximately 2.8 km to the east and north of the site.

Drinking water is supplied to Deniliquin from water that is extracted from the Edward River and treated at the Deniliquin water treatment plant prior to supply to the township.

2.6 Water use surveys

Since the 2017, community engagement efforts have focused on consulting with property owners in the area surrounding the Deniliquin training facility to understand water use within the broader area. This has involved the distribution of fact sheets, and the hosting of a community meeting and information session on 23 May 2017.

Two water use surveys have been distributed to a sample set of landowners within the vicinity of the site, based on advice from the EPA, in both 2017 and 2019 (GHD, 2017b; GHD, 2019a). The findings from water use surveys are summarised as follows:

- All of the properties that responded to the survey were identified as Industrial/Commercial Agricultural
- All of the properties identified town water as their primary water source

- No properties indicated they have a bore on their property, or that they had ever used bore water
- No properties indicated they have ever used surface or dam water from their property
- None of the respondents indicated having animals or livestock living on their property
- None of the respondents indicated having irrigated land
- No respondents within the investigation area indicated that they have used local creeks for recreational purposes.

3. Methodology

3.1 General

Sampling activities were undertaken over three days, between 16 and 18 August 2019. Sampling activities included collection of groundwater, surface water and sediment samples, as well as collection of samples from a fire truck used in training activities that was located at the FRNSW Training Facility.

Sampling activities were undertaken in general accordance with:

- HEPA (2018) *PFAS National Environmental Management Plan*
- *National Environment Protection (Assessment of Site Contamination) Measure 1999*

3.2 Groundwater sampling

The general methodology for groundwater sampling is summarised in Table 3.

Table 3 Groundwater sampling methodology

Stage	Description
Identification	Groundwater wells were identified using site figures and photographs from previous sampling activities. Four onsite wells (MW01-MW04), and four offsite wells (MW05-MW06, GW503702 and GW503704) were gauged and sampled.
Gauging	Wells were gauged using an interface probe, and the well depth measured The volume of water within the well was calculated to determine the volume of water required to be purged from the well prior to collection of samples.
Purging	Water was purged from wells using Teflon™ free disposable bailers, secured using a stainless steel tether line. Each bailer contains approximately one litre, and wells were purged until three volumes of water had been removed from the well. One exception to this was well MW04 which was exhibiting little recharge. As water quality parameters appeared relatively stable, and approximately six litres had been removed from the well, samples were collected prior to the removal of three volumes. Wells GW503702 and GW503704 located on the adjacent airport site were calculated to require removal of 105 and 81 litres of water respectively. As parameters had stabilised after removal of 12 and 18 litres respectively, and as recharge was good (i.e. the standing water level was stable), samples were collected prior to the removal of three volumes.
Field parameters	Field parameters were measured using a calibrated water quality meter, with measurements of temperature, pH, electrical conductivity (EC), dissolved oxygen (DO) and oxidation-reduction potential (ORP) recorded. Observations of turbidity, odour, sheen, and recharge were also recorded.
Sampling	All monitoring wells were grab sampled directly from the bailer.
Sample handling and transport	Following collection of samples, the sample bottles were placed on ice and stored in an insulated storage container (i.e. esky) prior to being forwarded to the analytical laboratory within the required holding time.

Stage	Description
Sample analysis	All groundwater samples were submitted for laboratory analysis of 30 PFAS analytes at the standard limit of reporting (LOR), as well as total dissolved solids (TDS).
Quality assurance and quality control (QA/QC)	A QA/QC sampling procedure was implemented, and is discussed in Section 6.
Water disposal	Purge water was collected in jerry cans and placed in a large (~300 L) hazardous materials plastic drum located at the site. GHD understands that there are a number of drums containing historical AFFF products to be collected from the site, and it is understood that the wastewater will be disposed of alongside these.

3.3 Surface water sampling

The general methodology for surface water sampling is summarised in Table 4.

Table 4 Surface water sampling methodology

Stage	Description
Identification	Surface water locations were identified using site figures. Eleven surface water locations were sampled (location SW12 was dry and unable to be sampled).
Field parameters	Field parameters were measured using a calibrated water quality meter, with measurements of temperature, pH, EC, DO and ORP recorded. Observations of turbidity, odour, and sheen were also recorded.
Sampling	All samples were collected via grab samples collected close to the water's edge using laboratory provided, plastic, unpreserved sample bottles. A new pair of nitrile gloves was worn for the collection of each sample.
Sample handling and transport	Following collection of samples, the sample bottles were placed on ice and stored in an insulated storage container (i.e. esky) prior to being forwarded to the analytical laboratory within the required holding time.
Sample analysis	All surface water samples were submitted for laboratory analysis of 30 PFAS analytes at the standard LOR.
QA/QC	A QA/QC sampling procedure was implemented, and is discussed in Section 6.

3.4 Sediment sampling

The general methodology for sediment sampling is summarised in Table 5.

Table 5 Sediment sampling methodology

Stage	Description
Identification	Sediment sampling locations were identified using site figures. Sediment was sampled from 19 locations.
Field observations	Field observations, including material description, and observations of anthropogenic inclusions, odour, or sheen were recorded.
Sampling	One sample was collected using a stainless steel hand auger with a sediment/sand head attachment. The remaining samples were collected via grab sample, as water was shallow. A new pair of nitrile gloves was worn for the collection of each sample, and sediment was transferred immediately to laboratory-supplied containers.

Stage	Description
Decontamination	The hand auger was decontaminated using a triple rinse procedure with deionised water.
Sample handling and transport	Following collection of samples, the sample bottles were placed on ice and stored in an insulated storage container (i.e. esky) prior to being forwarded to the analytical laboratory within the required holding time.
Sample analysis	All sediment samples were submitted for laboratory analysis of 30 PFAS analytes at the standard LOR, as well as TOC, and Standards Australia Leaching Procedure (ASLP).
QA/QC	A QA/QC sampling procedure was implemented, and is discussed in Section 6.

3.5 Fire truck sampling

The general methodology for collection of samples from the fire truck located at the FRNSW training facility is summarised in Table 6.

Table 6 Fire truck sampling methodology

Stage	Description
Identification	Samples were collected from three outlets located on the nearside of the fire truck.
Field observations	Field observations, including description of the liquid collected were recorded.
Sampling	Samples were collected by opening the ball valves or outlet caps, and the ensuing liquid being captured by laboratory supplied sample containers directly. A new pair of nitrile gloves were worn for the collection of each sample.
Sample handling and transport	Following collection of samples, the sample bottles were placed on ice and stored in an insulated storage container (i.e. esky) prior to being forwarded to the analytical laboratory within the required holding time.
Sample analysis	All samples collected from the fire truck were submitted for laboratory analysis of 30 PFAS analytes at the standard LOR, as well as TOC, and ASLP.
QA/QC	A QA/QC sampling procedure was implemented, and is discussed in Section 6.

4. Assessment Criteria

4.1 Basis for assessment

For the purpose of assessment of potential risk to human and ecological health due to PFAS contamination at the site, and in the surrounding man-made drainage channel network, assessment criteria were adopted directly from the HEPA (2018) *PFAS National Environmental Management Plan*.

HEPA (2018) represents a nationally-agreed suite of analytes for site investigations, and provides guidance values for protection of human and ecological health.

4.2 Rationale for assessment criteria

According to *Sediment quality assessment: a practical guide* (Simpson & Batley, 2016), a sediment is defined as 'unconsolidated mineral and organic particulate material that has settled to the bottom of aquatic environments'. All sediment samples were collected from constructed drainage lines that are not considered 'aquatic environments' in and of themselves. Therefore, the sediment samples collected in this investigation were assessed as soil against the adopted soil assessment criteria outlined in HEPA (2018), however continue to be referred to as 'sediment' for consistency with previous investigations undertaken at this site, and differentiation from soil samples collected from soil bores.

Analytical results for groundwater were assessed against the ecological criteria for freshwater, as it is considered that other freshwater surface water bodies (including Edwards River) are considered likely to be the end receptor for groundwater at the site. The 95% species protection scenario was adopted, as the area is considered to be a slightly-to-moderately disturbed ecosystem, due to the commercial operations in the area.

Analytical results for surface water were assessed against the ecological criteria for freshwater, as it is considered that other freshwater surface water bodies (including Mulwala Canal) are considered likely to be the end receptor for drainage channels in the east of the site. The 95% species protection scenario was adopted, as the area is considered to be a slightly-to-moderately disturbed ecosystem, due to the commercial operations in the area.

All of the responses to the land use surveys conducted in the area indicated that properties were connected to town water supply, and that surface water and bore water was not used for any purpose. Although GHD did not obtain responses from all properties within the investigation area, it is considered that proximity of the investigation area to Deniliquin township provides easy access to municipal water supply, and Deniliquin. This is supported by the consistency of the responses received. As such, surface water and groundwater were not assessed against drinking water criteria.

For each media, the assessment criteria for Industrial/Commercial land use were applied, as this is the zoning of the site and surrounding properties, as well as the functional use of land within the area.

4.3 Nominated assessment criteria

4.3.1 Surface water and groundwater

Analytical results from surface water and groundwater samples were assessed against the criteria presented in Table 7.

Table 7 Assessment criteria for surface water and groundwater

Assessment criteria	PFOS µg/L	PFOA µg/L	Exposure scenario
Freshwater guideline values	0.13	220	95% species protection – slightly to moderately disturbed systems

4.3.2 Sediment

Analytical results from sediment samples were assessed against the criteria presented in Table 8.

Table 8 Assessment criteria for sediment

Assessment criteria	PFOS/PFHxS (mg/kg)	PFOS (mg/kg)	PFOA (mg/kg)	Land use
Human health based guidance values	20	-	50	Industrial/commercial
Ecological guideline values	-	0.140	-	Industrial/commercial

5. Results

5.1 Groundwater results

5.1.1 Groundwater gauging results

Groundwater gauging results are summarised in Table 9. The top of casing (TOC) elevation for the wells previously installed by GHD (MW01-MW06) were surveyed previously, and were used to calculate the groundwater elevation in mAHD. Survey data was unavailable for groundwater wells GW503702 and GW503704.

Based on the gauging results, local groundwater at the site appears to be in a north to north-westerly direction.

Table 9 Groundwater gauging data

Well ID	TOC (mAHD)	Depth of well (m)	Depth to groundwater (mbTOC)	Groundwater elevation (mAHD)
MW01	93.688	12.14	12.14	81.55
MW02	92.682	12.75	12.75	79.93
MW03	92.810	16.9	16.9	75.91
MW04	93.515	13.73	13.73	79.79
MW05	93.757	13.42	13.42	80.34
MW06	93.668	12.8	12.8	80.87
GW503702	-	16.68	16.68	-
GW503704	-	15.69	15.69	-

5.1.2 Groundwater quality

Water quality parameters were recorded during the purging of the well to determine their stability, and whether it was appropriate to commence collection of samples. Stabilised parameters are summarised in Table 10.

Table 10 Summary of groundwater quality parameters

Well ID	pH	Temperature (°C)	EC (µS/cm)	DO (mg/L)	ORP [^] (mV)
MW01	7.30	20.1	2156	3.74	98.1
MW02	7.71	19.2	1574	6.17	94.3
MW03	7.68	18.8	2295	6.22	122.9
MW04	7.07	19.9	6080	4.81	110.0
MW05	7.42	19.9	2222	6.27	98.5
MW06	7.05	19.2	11445	1.69	-76.9
GW503702	7.51	19.0	7507	6.48	107.2
GW503704	7.40	18.6	9840	5.86	104.8

Notes: [^]Oxidation-reduction potential

During purging, field observations were recorded. No hydrocarbon or chemical odours, or petroleum sheen were noted. A summary of field observations are provided in Table 11.

Table 11 Groundwater field observation summary

Well ID	Summary of observations
MW01	Purge water was clear with no sheen or odour. Some rootlets were extracted from the well during bailing.
MW02	Purge water was mildly turbid, coloured white. No sheen or odour were observed. Good recharge.
MW03	Water was mildly turbid, coloured pale yellow-brown, however this decreased during purging. No odour or sheen were observed. Good recharge.
MW04	Purge water was mildly turbid, coloured reddish brown. No sheen or odour were observed. Three volumes were not extracted prior to sampling due to poor recharge of the well. Parameters appeared stable following removal of six litres however, so sampling was commenced.
MW05	Water was mildly turbid, coloured white, which increased and became whitish-brown during purging. No sheen or odour were observed. Good recharge.
MW06	Water was turbid, coloured brown. Tree roots were extracted from the well during bailing and an organic odour was observed. Good recharge.
GW503702	Purge water was mildly turbid, coloured pale white, however this decreased during purging and water became clear. No odour or sheen were observed. Good recharge.
GW503704	Purge water was clear with no odour or sheen. Good recharge.

5.1.3 Analytical results

Samples were collected from a total of eight groundwater monitoring wells including:

- Four wells located on the FRNSW site (MW01 to MW04)
- Two off-site wells (MW05 and MW06) installed by GHD in 2017
- Two existing groundwater bores located adjacent to an evaporation pond located on the neighbouring Deniliquin Airport facility (GW503702 and GW503704).

In general, analytical results from all groundwater wells were below the laboratory limit of reporting, with the exception of MW01 and MW04. Criterion exceedances are summarised in Table 12, with analytical results are provided in Appendix B.

Table 12 Summary of criteria exceedances for groundwater

Well ID	Criterion	Analyte	Criterion value	Analytical result
MW01	Freshwater 95% (HEPA, 2018)	PFOS	0.13 µg/L	17 µg/L

5.1.4 Historical groundwater data

Insufficient data exists to enable statistical trend analysis using the Mann-Kendall toolkit (or other trend analysis programme). In lieu of this, a qualitative comparison of the analytical results with those collected in January and June of 2017 is provided in

Table 13. Overall, results are largely consistent with those reported during previous monitoring events with maximum PFAS concentrations reported in monitoring location MW01.

Table 13 Qualitative comparison with historical data for groundwater

Location ID	Observation	Results from July 2019
MW02, MW03, MW05, MW06	PFAS below LOR in January and/or June of 2017	No change

Location ID	Observation	Results from July 2019
MW01 and MW04	PFAS detected above LOR in January and/or June of 2017	No change
MW01	Highest concentration of PFOS detected	No change
MW01	Concentrations of PFOS exceeded HEPA (2018) Freshwater 95% assessment criteria	No change

5.2 Surface water results

5.2.1 Surface water quality

Water quality parameters were recorded during the collection of surface water samples, and are summarised in Table 14

Table 14 Summary of surface water quality parameters

Surface water ID	pH	Temperature (°C)	EC (µS/cm)	DO (mg/L)	ORP [^] (mV)
SW01	9.17	14.4	168.4	10.31	39.9
SW02	8.37	11.5	159.0	4.28	-57.1
SW03	7.97	11.1	194.3	9.24	51.7
SW04	7.06	11.9	350.8	1.02	-73.5
SW05	7.14	11.3	90.2	8.39	57.5
SW06	7.45	11.6	81.8	7.3	34.0
SW07	7.60	12.6	113.6	8.35	25.2
SW08	7.47	12.9	106.7	3.49	42.3
SW09	8.33	14.8	19.8	8.80	72.9
SW10	7.84	10.0	149.4	4.57	60.4
SW11	8.61	11.6	62.1	9.77	48.1
SW12	Sampling location dry				

Notes: [^]Oxidation-reduction potential

During collection of surface water samples, field observations were recorded. No hydrocarbon or chemical odours or sheen were noted, however some bubbly foam was observed at location SW01, which may have been associated with the algal growth also observed at this location. A summary of field observations are provided in Table 15.

Table 15 Surface water field observation summary

Well ID	Summary of observations
SW01	Surface of water was bubbly/foamy, with brownish-green algal growth.
SW02	Water was clear (low turbidity). No odour or sheen were observed.
SW03	High turbidity, water coloured pale brown. No odour or sheen observed.
SW04	Water had low turbidity, coloured brown-grey. Sediment settled out quickly. No odour or sheen observed.
SW05	Water was clear, with no odour or sheen.
SW06	Water was clear, with no odour or sheen.
SW07	High turbidity, coloured whitish-brown. No odour or sheen were observed.
SW08	Mild turbidity, coloured brown-grey. No sheen or odour were observed.
SW09	Water was turbid, coloured brown-grey. No odour or sheen were observed. Very little water – was collected using a syringe.

Well ID	Summary of observations
SW10	Water was turbid, coloured grey. No sheen or odour observed.
SW11	Water was turbid, coloured pale brown. No sheen or odour were observed.
SW12	Sampling location dry

5.2.2 Analytical results

Samples were collected from 11 surface water locations, all located off-site. One location, SW12, was observed to be dry.

Analytical results from seven of the 11 surface water samples were observed to exceed the assessment criteria. Concentrations above LOR ranged between 0.02 µg/L and 0.86 µg/L, with the highest concentration observed in location SW03, approximately 200 m north-east of the site. Criterion exceedances are summarised in Table 16, with analytical results provided in Appendix B.

Table 16 Summary of criteria exceedances for surface water

Criterion	Number of exceedances	Analyte	Criterion value (µg/L)	Maximum concentration (µg/L)
Freshwater 95% (HEPA, 2018)	7 of 11	PFOS	0.13	0.83

5.2.3 Historical surface water data

Insufficient data exists to enable statistical trend analysis using the Mann-Kendall toolkit (or other trend analysis programme). In lieu of this, a qualitative comparison of the analytical results with those collected in December 2016 and May of 2017 is provided in Table 17. In general, surface water results were largely consistent with the results obtained during previous rounds of monitoring.

Table 17 Qualitative comparison of historical data for surface water

Location ID	Observation	Results from July 2019
SW11	PFAS below LOR	No change
SW01, SW02, SW03, SW04, SW06, SW08, SW10	PFAS detected above LOR	No change
SW01, SW02, SW03, SW04, SW06, SW08	Concentrations of PFOS exceeded HEPA (2018) Freshwater 95% assessment criteria	No change
SW07, SW09	Sample location dry, unable to sample	Not dry – sample collected

5.3 Sediment results

5.3.1 Observations

Sediment samples were collected from 19 locations both onsite (SS01, SS02, and SS14) and offsite (SS03-SS13, and SS15-SS19). Material was generally observed to be clay, sandy clay or gravelly clay, with a clayey gravel observed at one location (SS02).

The sediment material ranged between pale grey to medium grey-brown to dark brown in colour, with variously low to high plasticity.

Glass was observed at one location (SS04), with rootlets in a number of other locations, however no other anthropogenic material was observed. A moderately strong organic odour was observed at SS15, however no other odours were observed.

Location SS14 (onsite) was a concrete lined spoon drain containing no sediment. The sample in this location was collected from a break in the concrete wall.

The drainage channel at location SS02 (onsite) was poorly defined.

5.3.2 Analytical results

Analytical results from two of the 19 sediment samples were observed to exceed the ecological assessment criteria for PFOS. Concentrations above LOR for PFOS ranged between 6.6 µg/kg and 5000 µg/kg. The two highest concentrations were observed at onsite locations SS01 (5000 µg/kg), and SS02 (1600 µg/kg). Criterion exceedances are summarised in Table 18, with analytical results provided in Appendix B.

Table 18 Summary of criteria exceedances for sediment

Criterion	Number of exceedances	Analyte	Criterion value (µg/kg)	Maximum concentration (µg/kg)
Ecological indirect exposure commercial/industrial (HEPA, 2018)	2 of 19	PFOS	140	5000

5.3.3 Leachability results

In addition to analysis for the 30 PFAS analytes, all sediment samples were also analysed using ASLP. HEPA (2018) do not describe assessment criteria for leachability results and as such, a qualitative assessment of these is provided in Table 19. Analytical results are provided in Appendix B.

Table 19 Qualitative assessment of leachability results

Analyte	Summary
Perfluorooctane sulfonic acid (PFOS)	Concentrations above the LOR in all samples except SS17 (located east of Cobb Highway) Highest concentrations of PFOS were detected in onsite samples SS01 (510 µg/L) and SS02 (87 µg/L) Analytical results Offsite samples ranged between <0.01 µg/L (SS17) and 1.9 µg/L (SS08)
Perfluorohexane sulfonic acid (PFHxS)	Concentrations above the LOR were observed in samples collected from onsite locations SS01 (7.1 µg/L), SS02 (2.7 µg/L) and SS14 (0.03 µg/L), as well as in off-site locations SS05 (0.01 µg/L) and SS08 (0.01 µg/L)
Perfluorooctanoic acid (PFOA)	Concentrations above the LOR were observed in samples collected from onsite locations SS01 (1.3 µg/L) and SS02 (1.0 µg/L), as well as off-site location SS05 (0.02 µg/L)

5.3.4 Historical sediment data

Insufficient data exists to enable statistical trend analysis using the Mann-Kendall toolkit (or other trend analysis programme). In lieu of this, a qualitative comparison of the analytical results with those collected in November 2016 or May of 2017 is provided in Table 20.

Table 20 Qualitative comparison of historical data for surface water

Location ID	Observation	Results from July 2019
SS01, SS02, SS03, SS04, SS05, SS06, SS08, SS09, SS10	PFAS detected above LOR	
SS07, SS11, SS12, SS13, SS16, SS17, SS18	PFAS detected above LOR	Non detect (<LOR)
SS01, SS02	Concentrations of PFOS exceeded HEPA (2018) ecological assessment criteria	No change
SS01, SS02	Analytical results	Analytical results were observed to be 1-2 orders of magnitude higher than previously recorded.
All locations	Human health assessment criteria not exceeded	No change

5.4 Fire truck results

5.4.1 Observations

One fire truck was located at the FRNSW training facility. According to the site contact, the truck is used for training activities. Identification details of the fire truck are summarised in Table 21.

Table 21 Fire truck identification

Truck type	Truck ID	Year	Service location	Licence plate
2 Urban Pumper	10492	August 2002	FRNSW Training Facility Deniliquin	BF09BL

Samples were collected on 18 July 2019 from three outlets on the truck's nearside (i.e. passenger or left hand side of the truck). Two outlets were also located on the truck's offside (i.e. driver's or right hand side of the truck side); the site contact indicated that these were identical to the nearside outlets, and that a splitter routed tank water to either side, depending on the fire-fighting needs (e.g. location and proximity to fire), but that the water tank was common to both sides. Sample identification and descriptions are provided in Table 22

Table 22 Fire truck sample descriptions

Sample ID	Sample location	Sample description
10492_RNSD1	Rear, nearside Delivery 1	Water, yellow-brown but clear. No odour or sheen.
10492_RNSD2	Rear, nearside Delivery 2	Water, yellow-brown but clear. No odour or sheen. Duplicate sample FTBD01 and FTSD01 collected
10492_RNCBFO	Rear, nearside, Class B foam outlet	Thick brown liquid, high viscosity. Less than 5 mL collected.

5.4.2 Analytical results

PFAS was detected at concentrations above the laboratory LOR in all three samples analysed.

The maximum concentrations of PFOS, PFHxS and PFOA, as well as 6:2 Fluorotelomer Sulfonate (6:2 FTS), were observed in the sample collected from the Class B foam outlet, and were approximately four orders of magnitude greater than concentrations of these compounds in samples collected from the Delivery 1 and Delivery 2 outlets.

Analytical results for the fire truck sampling are presented in Appendix B and are summarised in Table 23.

Table 23 Summary of fire truck sampling analytical results

Sample ID	PFOS (µg/L)	PFHxS (µg/L)	PFOA (µg/L)	6:2 FTS (µg/L)	PFAS (sum of total) (µg/L)
10492_RNCBFO	1,900	330	190	16,000	20,700
10492_RNSD1	0.18	0.05	0.05	1.2	2.55
10492_RNSD2	0.30	0.01	<0.01	<0.05	0.33

6. Quality assurance and quality control

6.1 Field quality assurance and quality control

All fieldwork was conducted in general accordance with GHD standard operating procedures (SOPs), which facilitate the collection of representative environmental samples by using uniform and systematic methods. Key requirements of these procedures are described in Table 24.

Table 24 Summary of QA/QC field procedures

Procedure	Description
Dedicated sampling equipment	To mitigate the risk of cross-contamination between samples, new disposable gloves were worn for the collection of each sample. Hand augers were decontaminated between collection of samples.
Calibrated field equipment	The water-quality meter was calibrated by the rental supplier, as was the interface probe. Calibration certificates are provided in Appendix C.
Sample identification procedures	Sample containers were clearly labelled with a unique sample identification number referring to the sample location and depth of sample collection (where appropriate), date, and sampler's initials.
Sample storage	Sample containers were transferred to an ice-filled insulated cooler (i.e. esky) for preservation prior and during shipment to the testing laboratory.
Chain of custody protocols	A chain of custody form was completed and provided to the testing laboratory with the samples, tracking the delivery times and conditions of sample delivery and receipt.

6.2 Data quality indicators

Data obtained during this investigation was assessed to determine whether it could be relied upon to make decisions. Acceptance criteria for this investigation were in general accordance with limits described in Standards Australia (2005) *AS4482.1 Guide to the investigation and sampling of sites with potentially contaminated soil - Part 1: Non-volatile and semi-volatile compounds*, and GHD's SOP for *Verification of Analytical Results* (GHD, 2014a) and *Quality Assurance Sampling* (GHD, 2014b).

The data quality indicators and acceptance criteria are summarised in Table 25 and discussed in detail below.

Table 25 Summary of data quality objectives and indicators

Data quality objective	Data quality indicator
Precision	Duplicate samples were collected at a rate consistent with recommendations in HEPA (2018), with one intra-laboratory sample and one inter-laboratory sample collected per 10 primary samples collected. Intra-laboratory samples were submitted to the primary laboratory for analysis, with the inter-laboratory samples submitted to a selected secondary laboratory for analysis.

Data quality objective	Data quality indicator
Accuracy	<p>The hand auger was decontaminated using a triple-rinse decontamination process using deionised water.</p> <p>The hand auger was only required for collection of one sediment sample, as such, only one rinsate sample was collected.</p> <p>This was collected by pouring deionised water across the decontaminated hand auger and into the sample container for analysis.</p>
Representativeness	<p>Sample jars for collection of primary samples and QA/QC assessment were sourced from the primary laboratory, and were of an appropriate size and material for the required analysis.</p> <p>Sampling activities were undertaken by field staff with appropriate experience in collecting environmental samples, and in particular, collection of samples pertaining to investigation of PFAS impacted sites.</p> <p>Samples were collected in accordance with GHD's standard operating procedures.</p> <p>All samples were submitted and analytes extracted and analysed within the holding time.</p> <p>The limits of reporting were equal to or below the assessment criteria for all analytes.</p>
Comparability	<p>Laboratory analysis was undertaken by NATA accredited laboratories for both primary analysis (i.e. Eurofins mgt, NATA accreditation: 1261) and secondary analysis (i.e. ALS Environmental, NATA accreditation: 825).</p>
Completeness	<p>Sample descriptions were complete and appropriate.</p> <p>The chain of custody documentation and procedures were completed and remained unbroken.</p> <p>One intra-laboratory sample was analysed and one inter-laboratory sample was analysed out of eight primary groundwater samples. This gives an individual ratio of 12% each, which exceeds the minimum recommendation of 10%.</p> <p>Two intra-laboratory samples and two inter-laboratory samples were analysed out of 11 primary surface water samples. This gives an individual ratio of 18% each, which exceeds the minimum recommendation of 10%.</p> <p>Two intra-laboratory samples and two inter-laboratory samples were analysed out of 19 primary sediment samples. This gives an individual ratio of 10.5 % each, which exceeds the minimum recommendation of 10%.</p>

6.2.1 Rinsate analytical results

The hand auger used for sediment sampling was decontaminated using a triple-rinse decontamination process using deionised water.

Rinsate sample RIN01 was collected by pouring deionised water across the hand auger and into the sample container for analysis.

Analytical results for RIN01 were below the laboratory limit of reporting for all analytes, indicating that cross-contamination between sampling locations was unlikely to have occurred, due to effective decontamination procedures. These results are summarised in Appendix B.

6.2.2 Duplicate sample analytical results

Relative percentage difference (RPD) calculations are a quantitative measure of the accuracy of the analytical results. Standards Australia (2005) describe an acceptable RPD as <30 to 50 percent, though it is noted that the variation may be higher for organic analysis, and for low concentrations of analytes. Where a result is below the LOR for one of the paired samples, the concentration assigned to that sample is the LOR. Where both results are reported below the LOR, the RPD is not calculated.

RPD summary tables are provided in Appendix B.

Groundwater

No RPD results greater than 0% were calculated.

Surface water

Of the 150 RPDs calculated for surface water, five RPD results exceeded the acceptance criterion of <30-50% for samples SW11 and SWSD02. These ranged between 100-179% for a number of PFAS compounds, which included PFOS and 6:2 FTS.

As the concentration of PFOS in SWSD02 was 0.05 µg/L which is one order of magnitude lower than the assessment criterion (compared to the non-detection for SW11), and as the majority of RPDs calculated for surface water duplicate samples met the acceptance criterion, this RPD is not considered to affect the outcomes of this investigation.

Sediment

Of the 150 RPDs calculated for sediment, one RPD result exceeded the acceptance criterion of <30-50%. The RPD was calculated to be 145% for PFOS between samples SS04 and SSSD02. As both of these results were more at least one order of magnitude below the assessment criteria for PFOS, and as the remaining RPD calculated for sediment duplicate samples met the acceptance criterion, this RPD is not considered to affect the outcomes of this investigation.

Fire truck

Of the 70 RPDs calculated for surface water, two RPD results exceeded the acceptance criterion of <30-50%. The RPDs for PFOS was calculated to be 164% and 187% for the inter-laboratory and intra-laboratory samples respectively.

As the highest concentration for PFOS was reported for the primary sample, this is considered the most conservative result, and this RPD is not considered to affect the outcome of this investigation.

6.2.3 Completeness

Sample descriptions as provided were complete and appropriate. The chain of custody documentation and procedure was completed and remained unbroken.

Sufficient intra-laboratory and inter-laboratory duplicate samples were collected and analysed to meet the minimum requirements. No critical RPD results were observed that would affect the outcome of this investigation.

No critical samples are considered to exist for this data set. The data obtained for this investigation is considered valid and suitable to be relied upon for the purposes of this investigation.

7. Conceptual site model

7.1 Conceptual site model

A preliminary CSM was developed and updated by GHD during the PSI, ESA, and Phase 2 ESA undertaken by GHD (GHD, 2016; GHD, 2017a; GHD, 2017b). The CSM has been updated based on the findings from this investigation, as well as additional information presented in *Water use survey outcomes* (GHD, 2019a). A summary of the CSM is provided in Table 26.

Table 26 Conceptual site model

Potential source	Pathway	Receptor	Pathway complete	Modification of CSM from previous
Soils in firefighting training area	Direct contact	FRNSW commercial workers	Unlikely – PFAS impact detected previously in shallow soil samples collected from this area (SB01-SB04) however, impact reported below adopted human health assessment criteria.	Not assessed as part of this investigation
		Intrusive maintenance workers		
		On site ecology		
	Vertical migration of leachate through unsaturated zone	Groundwater	Yes – PFAS impact reported in MW01 located in the training area and MW04, north-east of the main source zone.	No change
	Surface water runoff	Surface water within drainage channels, and ultimately the off-site dam to the north of the site.	Yes – PFAS detected in surface water and some sediment samples within drainage channels in the investigation area in excess of the adopted ecological guidelines	No change
PFAS impacted sediments in offsite surface water drainage channels	Vertical/horizontal migration of leachate into surface water and through unsaturated zone into groundwater	Groundwater	Unlikely – groundwater bores do not exist in the vicinity of offsite sediment samples where ASLP results were above LOR. Concentrations were low, however, and may indicate that PFAS is not leaching into groundwater from impacted offsite sediments.	Added to CSM
		Surface water	Yes – concentrations of PFOS were observed to be above the HEPA (2018) freshwater assessment criteria in a number of surface water samples co-located with high concentrations of PFOS in sediment and/or leachable concentrations of PFOS.	Added to CSM

Potential source	Pathway	Receptor	Pathway complete	Modification of CSM from previous
PFAS impacted groundwater	Vertical/horizontal migration	Down gradient surface waters recharged by groundwater	No – PFAS concentrations were detected above adopted ecological assessment criteria in groundwater in MW01, however concentrations above the assessment criteria was not observed in hydraulically down-gradient wells to the north, or north-west of this well, suggesting that impact to groundwater has been delineated, and that migration to surface water receptors beyond these bores is unlikely. This is consistent with historical analytical results.	Changed from ‘unlikely’ to ‘no’
		Abstraction bores (stock and/or domestic use)	No - PFAS impact detected above laboratory LOR appears highly localised to MW01 and, to a lesser extent, MW04 and is delineated to the north and east of these locations. In addition, results of the water use survey (GHD, 2019a) indicate no groundwater use for domestic or stock use in the investigation area.	Changed from ‘unlikely’ to ‘no’
PFAS impacted surface water	Vertical migration	Groundwater	Unlikely - groundwater bores do not exist in the vicinity of offsite surface water samples, however, as groundwater is encountered at depths of more than 12 mbgl in the investigation area, potential impact to groundwater via vertical migration from impacted surface waters is considered unlikely.	Added
		Sediment	Yes – concentrations of PFAS were detected at above the LOR in many of the sediment sampling locations within the investigation area	Added
	Dermal contact and incidental ingestion	Recreational users, stock and/or livestock	No – GHD (2019a) indicated that surface water was not utilised in any way by site users. GHD (2019a) also found that none of the survey respondents indicated having animals or livestock living on their property. During the site investigation, GHD staff did not observe any livestock within the investigation area.	Change from ‘Yes’ to ‘Unlikely’ based upon site observations and results from the GHD (2019a) water use survey.

Potential source	Pathway	Receptor	Pathway complete	Modification of CSM from previous
	Migration via surface water flows into receiving water bodies including Mulwala Canal (Edward River and Aljoes Creek are not expected to be receiving water bodies for this site)	Rural commercial/ industrial properties, including human users and agricultural livestock outside of the investigation area	No – PFAS was not detected in Mulwala Canal at concentrations above LOR. Concentrations of PFAS in samples collected from surface water in drainage channels from the investigation area close to where water is expected to migrate off-site were below the LOR and/or assessment criterion.	CSM updated to include this potential source-receptor pathway
		Aquatic ecosystems in receiving water bodies	No – PFAS was not detected in Mulwala Canal at concentrations above LOR. Concentrations of PFAS in samples collected from surface water in drainage channels from the investigation area close to where water is expected to migrate off-site were below the LOR and/or assessment criterion.	Added
Storage of AFFF	Dermal contact, vertical/horizontal migration of leachate through unsaturated zone, and/or surface runoff and sediment transport	FRNSW commercial workers, intrusive maintenance workers, groundwater, surface water, off-site rural commercial/ industrial properties, and off-site ecological (terrestrial and aquatic)	Possible – PFAS present in soil and groundwater at MW04, east of the AFFF storage area. However, no impact observed in down gradient monitoring well (MW06), therefore substantial migration to the north-east is unlikely.	No change
Former pool area, now used for confined space training	Dermal contact, vertical/horizontal migration of leachate through unsaturated zone, and/or surface runoff and sediment transport	FRNSW commercial workers, intrusive maintenance workers, groundwater, surface water, off-site rural commercial/ industrial properties, and off-site ecological (terrestrial and aquatic)	Unlikely – PFAS concentration less than the LOR in deep soil samples from around the former pool (MW03, SB06 and SB07) suggesting that PFAS impact at these locations is likely to have been from surface activities and not the underground pool.	Not assessed as part of this investigation

Potential source	Pathway	Receptor	Pathway complete	Modification of CSM from previous
Liquids containing PFAS and/or AFFF concentrate	Direct contact with PFAS impacted liquid or aerosols discharged from fire trucks during training activities or maintenance works	FRNSW instructors and/or trainees during training activities. Maintenance workers undertaking maintenance of the vehicle	Possible – PFAS compounds were detected in each of the sample points, with the highest concentrations observed in the sample collected from the rear, nearside (passenger side) Class B foam outlet. Concentrations of selected PFAS analytes (i.e. PFOS, PFHxS, PFOA and 6:2 FTS) in this sample were four orders of magnitude greater than concentrations of these analytes obtained from the water delivery outlets.	Added
	PFAS impacted liquids entering the environment through release of tank liquid onto ground surfaces, entry into drainage channels, and/or vertical migration into groundwater	Surface soils, surface water in drainage channels, groundwater	Possible – it is expected that training activities involving discharge of liquids to the environment are undertaken at the FRNSW training facility (the site), and continuous discharges may be acting as an ongoing source of contamination to the environment within the training grounds.	Added

8. Discussion

8.1 Discussion of key findings

8.1.1 Groundwater

Groundwater was generally observed to have good recharge, with mild to high turbidity. No contaminant indicators (e.g. chemical odours or sheen) were observed during purging of groundwater wells.

The HEPA (2018) Freshwater 95% criterion was exceeded in one groundwater well, MW01, located on site. This is consistent with historical analytical results for this well. Concentrations of PFAS above the laboratory LOR were only recorded in one other onsite monitoring well, MW04, located to the north east of MW01. Concentrations of PFOS in groundwater at MW01 were three orders of magnitude higher than concentrations reported in MW04.

GHD consider that the impacts in groundwater are highly localised, and that the impact in MW01 has been delineated to the east by MW05, and hydraulically down-gradient to the north and north-west by MW04, MW03 and MW02. Hydraulic connectivity is not expected between groundwater at the site and Mulwala Canal, and though it is considered possible that groundwater is connected with the Edward River, as PFAS has been shown to be highly localised, it is considered unlikely that PFAS is entering the Edward River system. The potential for vertical migration of PFAS to groundwater from impacted sediment or surface water sources (on-site and off-site) is considered unlikely based on concentrations reported, leachability data and depth to groundwater.

Whilst the extent of PFAS impact to the south of MW01 is not fully understood, it is noted that the groundwater flow directions is inferred to be towards the north and north-westerly direction. Further, no users of groundwater or sensitive receptors have been identified to the south of the site.

8.1.2 Surface water

Surface water turbidity ranged across the locations from clear (low turbidity) to highly turbid, but did not appear to be associate with flow rate. No sheen or odour was observed at any location.

The surface of the water near SW01 was observed to be bubbly/foamy. Although PFAS was detected at concentrations above the laboratory LOR in this location, the results were comparable to concentrations reported at other locations, as well as an order of magnitude lower than the previous analytical results from sampling at this location undertaken in November 2016. Field observations from this location may have been attributed to algal growth which was also noted during sampling.

A complete pathway remains valid in the CSM for potential PFAS exposure to ecological receptors via surface water in drainage channels located within the investigation area.

There is not considered to be a complete pathway between PFAS impacted surface water at the site and within the investigation area, and Mulwala Canal, the Edward River, or Aljoes Creek however. This is due to concentrations for PFAS observed to be below the LOR and/or HEPA (2018) Freshwater 95% assessment criterion in samples collected from Mulwala Canal (SW11) and samples collected adjacent to Cobb Highway (SW09 and SW10). Locations SW09 and SW10 are close to where the surface water drainage channels are assumed to cross Cobb Highway before flowing adjacent to the canal for approximately 1800 m, prior to discharging to it approximately 2.4 km southeast of the site.

HEPA (2018) recommends sampling aquatic and other biota to assess the potential for bioaccumulation wherever a plausible transport pathway from a contaminated source exists, even if water concentrations are below the LOR. GHD notes that the ecology utilising the drainage channels in the investigation area is not fully understood, (outside the scope of this current and previous stages of investigation) and consideration of potential ecological receptors within the area would be prudent before progressing a potentially unnecessary biota sampling program.

Analytical results were below the LOR for all individual PFAS analytes in the sample collected from Mulwala Canal (SW11) and is consistent with previous analytical results (GHD, 2017b)..

Based on results of the GHD (2019a) water use survey, commercial properties do not use surface water for stock watering or domestic purposes.

8.1.3 Sediment

Anthropogenic inclusions (glass) were observed at one sediment location, SS04, however no other contaminant indicators (e.g. chemical odour or sheen) were observed.

Analytical results exceeded the HEPA (2018) ecological criteria for commercial/industrial land use in two of the 19 samples collected (SS01 and SS02). Both of these samples were collected onsite from surface water channels that are very poorly defined; these locations previously reported concentrations of PFAS above the ecological screening criteria.

GHD notes that the results for SS01 and SS02 obtained from the current sampling event were more than an order of magnitude higher than those recorded during previous events. This suggests sediments may be acting as an on-going source of PFAS impact, with the potential for off-site discharge via surface water flow following heavy rainfall. It is possible that ongoing training events using fire truck 10492 (shown to contain PFAS impacted water and AFFF concentrate) may be acting as an ongoing contaminant source in this area. Conversations with the FRNSW site contact indicated this area was historically a basin or low-point at the site, where AFFF would often pool in following training events and may be continuing to do so.

Results from ASLP testing of sediment samples indicated that sediment both on and offsite may be acting as an ongoing source, with a number of PFAS analytes above the LOR. The implications of this are that PFAS is likely to be leaching from impacted sediments into surface water both on and offsite, and potentially into groundwater at the site. This is consistent with previous ASLP analytical results obtained from soil samples for the site (GHD, 2017b). The highest ASLP results were observed in onsite locations SS01 and SS02. Offsite location SS08 was observed to have higher concentrations of PFAS in leachability results than SS06 and SS07, which are located nearer to the site. SS08 was observed to be only slightly moist, with the channel poorly defined in this area, and no surface water observed. The higher concentrations in SS08 may therefore be explained by concentration of PFAS analytes due to evaporation of water. From site observations, it is not expected that there is a secondary source or alternative transport pathway to this location (e.g. an additional stormwater channel).

8.1.4 Fire truck sampling

Insufficient liquid was collected for sample 10492_RNCBFO to be analysed by the laboratory. It was decided that the liquid would be diluted to enable analysis, which would necessarily raise the LOR and potentially provide limited information (e.g. if assessed against assessment criteria with values lower than the raised LOR). The highest concentration of all analytes were observed in this sample, except where the LOR was raised significantly (i.e. one to two orders of magnitude) above the concentrations detected in the other two samples. This sample was collected directly from the foam outlet.

Concentrations of PFAS observed in samples collected from the two water outlets were generally observed to be four orders of magnitude lower than that collected from the Class B foam outlet, as could be expected due to dilution of foam within the truck's water tank.

Water from the water outlets and concentrate from the foam outlet are considered to be potential sources of contamination, however the contamination in the water outlet is likely to originate from water cycling through the foam tank where the concentrate. Potential receptors are considered to be both environmental and human (FRNSW personnel including training scenarios, operational use and maintenance).

Discharge to the environment may occur during accidental releases, maintenance activities, or training activities at the site and may be acting as an ongoing source of contamination to sediment and groundwater at the site.

Discharges may also occur near the FRNSW training offices where the truck is garaged, and may have caused surface soils and surface water near these offices to be impacted. Environmental investigation have not previously targeted this area.

Human receptors, including FRNSW instructors and trainees, are likely to be exposed to PFAS impacted water or AFFF concentrate via direct contact during training activities. Staff responsible for maintenance of the fire truck may also be exposed via direct contact during maintenance activities, or other tasks requiring operation of the truck's water or foam outlets.

GHD is currently in the process of delivering a human health risk assessment (HHRA) for FRNSW personnel based on potential exposure during operational, training and maintenance works. The works were not finalised at the time of this report however preliminary review of the data against the risk based threshold levels developed in the GHD (2019b) *FRNSW PFAS Investigations: Fire Truck Sampling and Threshold Derivations* indicate that sample collected from the Class B foam outlet would present a potential risk to human health under a training, operational and maintenance scenario. Concentrations in the water samples collected from outlets were orders of magnitude lower and below the draft risk based threshold levels developed by GHD. The results of the sampling of the fire truck from Deniliquin should be reviewed with reference to the outcomes of the risk assessment once works are finalised, including consideration of how FRNSW personnel may be exposed to discharge from the class B foam outlet, if at all.

9. Conclusions and recommendations

9.1 Conclusions

The objective of this investigation was to obtain current monitoring data to inform PFAS trend analysis and refine the CSM. The findings of these works support the previous conclusion that the site contains contamination from historical use of AFFF products containing PFAS. The primary sources of PFAS (foam products) are no longer present on site; however secondary sources of PFAS including impact to soil, drain sediment and surface water remain.

Based on the scope of works presented in Section 1.3, and subject to the limitations outlined in Section 1.4, the following conclusions are made:

- Potential risks associated with the presence of PFAS in groundwater on-site are considered to be low, based on the following lines of evidence:
 - Groundwater is not extracted for use on site
 - PFAS impact in groundwater is considered to be delineated and migration to potential surface water receiving bodies beyond these bores is considered unlikely based on available data, depth to groundwater and the inferred direction of groundwater flow.
 - Based on the outcomes of the water use survey, and discussions with local personnel, groundwater is not used for domestic or stock purposes in the investigation area.
- PFAS is present in off-site surface water at concentrations exceeding ecological investigation levels. Results were largely consistent with previous sampling events and detections of PFAS in surface water typically corresponded with elevated levels of PFAS in sediments at the same locations. Whilst livestock are not kept on any properties within the investigation areas, potential risks to ecological receptors, including birds, cannot be discounted.
- The potential for migration of PFAS via surface water to receptors including Edward River and Mulwala Canal is considered unlikely. This is further supported by the following lines of evidence:
 - Concentrations of PFAS in surface water drainage channels, collected from areas close to where water would be expected to further migrate, were below the LOR and/or assessment criterion.
 - PFAS was not detected in Mulwala Canal at concentrations above LOR.
- Whilst PFAS is present in on-site soils, concentrations were below criteria for the protection of human health. Based on the available data and our understanding of site operations by FRNSW personnel, potential risks of exposure under the currently commercial land use scenario are considered to be low.
- PFAS is present in samples collected from the fire truck based at the Deniliquin site. Whilst concentrations in water outlet locations do not exceed the draft risk based threshold levels developed by GHD (2019b) under another program of works, elevated results were reported in the Class B foam outlet. There is the potential for exposure to FRNSW personnel during training / maintenance activities or for PFAS impact from fire trucks to enter the environment, potentially acting as an ongoing source of contamination.

9.2 Recommendations

Based on the findings of these and previous works, the following recommendations are made:

- Further groundwater and surface water monitoring at existing sampling locations to support trend analysis and further inform the CSM

- Undertake a desktop biodiversity study to identify potential ecological receptors (i.e. fauna) within the investigation area that may utilise the surface water drainage system, to refine the CSM for the site and investigation area
- Review of site management practices for training / discharge from fire trucks including consideration of drainage systems where the truck is garaged to assess whether run off is diverted to municipal water and the development and implementation of appropriate protocols for these activities
- Review of truck sampling data from fire truck 10492 against the wider program of works for FRNSW trucks currently in progress (GHD, 2019) and consideration of appropriate management actions based on the outcomes of that review.

10. References

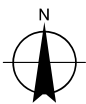
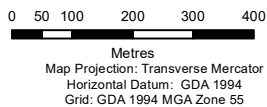
- ANZECC. (2000). *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. Australian and New Zealand Environment and Conservation Council.
- Brown, C. M., & Stephenson, A. E. (1991). 1991. *Geology of the Murray Basin [southeastern Australia] (1:1 000 000 scale map)*. Canberra, Australia: Bureau of Mineral Resources.
- Bureau of Meteorology. (2019). *Australian Groundwater Explorer*. Retrieved from <http://www.bom.gov.au/water/groundwater/explorer/map.shtml>
- EnRisk. (2016). *Proposed decision tree for prioritising sites potentially contaminated with PFAS*.
- Geoscience Australia. (1993). *Deniliquin NSW Hydrogeological map of the Murray Basin series 1:250 000*. Commonwealth of Australia (.).
- GHD. (2014a). *Verification of Analytical Results*.
- GHD. (2014b). *Quality Assurance Sampling*.
- GHD. (2016). *Deniliquin PFAS Investigation: Preliminary Site Investigation and Sampling & Analysis Quality Plan*.
- GHD. (2017a). *Deniliquin Training Facility: Environmental Site Assessment - PFAS*.
- GHD. (2017b). *Deniliquin Training Facility: Phase 2 Environmental Site Assessment - PFAS*.
- GHD. (2019). *Water use survey outcomes*.
- HEPA. (2018). *PFAS National Environmental Management Plan. Heads of EPAs Australia and New Zealand (HEPA)*.
- National Environment Protection (Assessment of Site Contamination) Measure 1999*.
- NHMRC & NRMCC. (2011). *Australian Drinking Water Guidelines 6 (Version 3.5 updated August 2018)*.
- NSW EPA. (2019). *The NSW Government PFAS Investigation Program*. Retrieved August 07, 2019, from NSW Environment Protection Authority: <https://www.epa.nsw.gov.au/your-environment/contaminated-land/pfas-investigation-program>
- Simpson, S., & Batley, G. (2016). *Sediment quality assessment: a practical guide*. CSIRO.
- Standards Australia. (2005). *AS4482.1 Guide to the investigation and sampling of sites with potentially contaminated soil - Part 1: Non-volatile and semi-volatile compounds*.

Appendix A - Figures



LEGEND

- Site Boundary
- Cadastre
- Streets
- Major Waterways
- Minor Waterways



Fire and Rescue NSW
Deniliquin Additional Monitoring

Job Number | 21-28370
Revision | A
Date | 25 Oct 2019

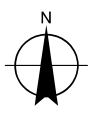
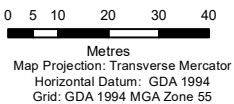
Site Location

Figure 1



LEGEND

- Site Boundary
- Cadastre
- Streets
- Major Waterways
- Minor Waterways
- Surface Drainage

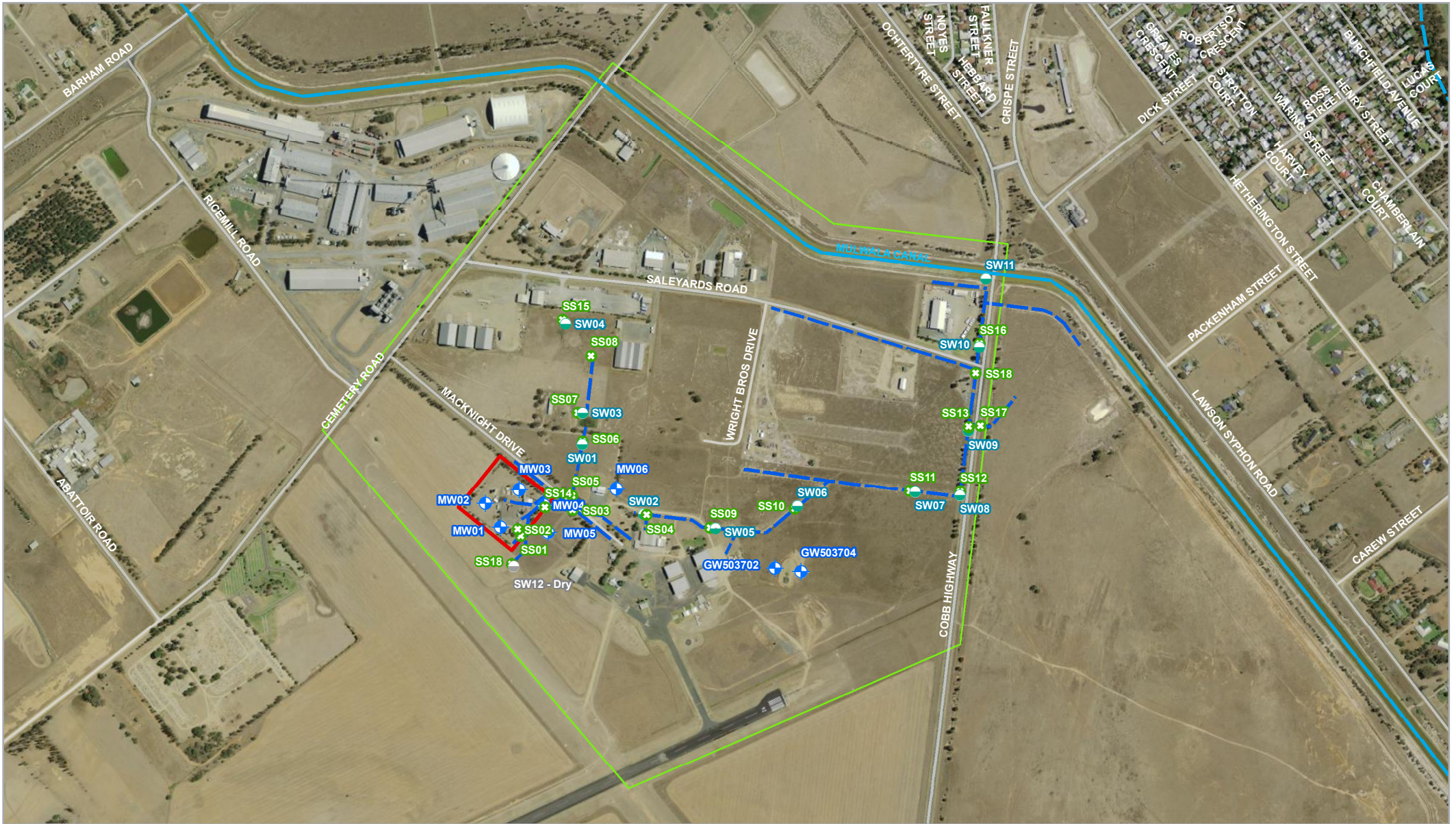


Fire and Rescue NSW
Denilquin Additional Monitoring

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Date | 25 Oct 2019

Site Layout

Figure 2



Legend

Sampling Location Type

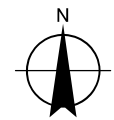
- Groundwater Monitoring (GHD, 2019)
- Sediment Sample Location (GHD, 2019)
- Surface Water Sample Location (GHD, 2019)
- Surface Water Sample Location, Dry (GHD, 2019)
- Minor Waterways
- Major Waterways
- Streets
- Surface Drainage
- Investigation Area
- Site Boundary

Paper Size ISO A4

0 80 160 240 320

Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55



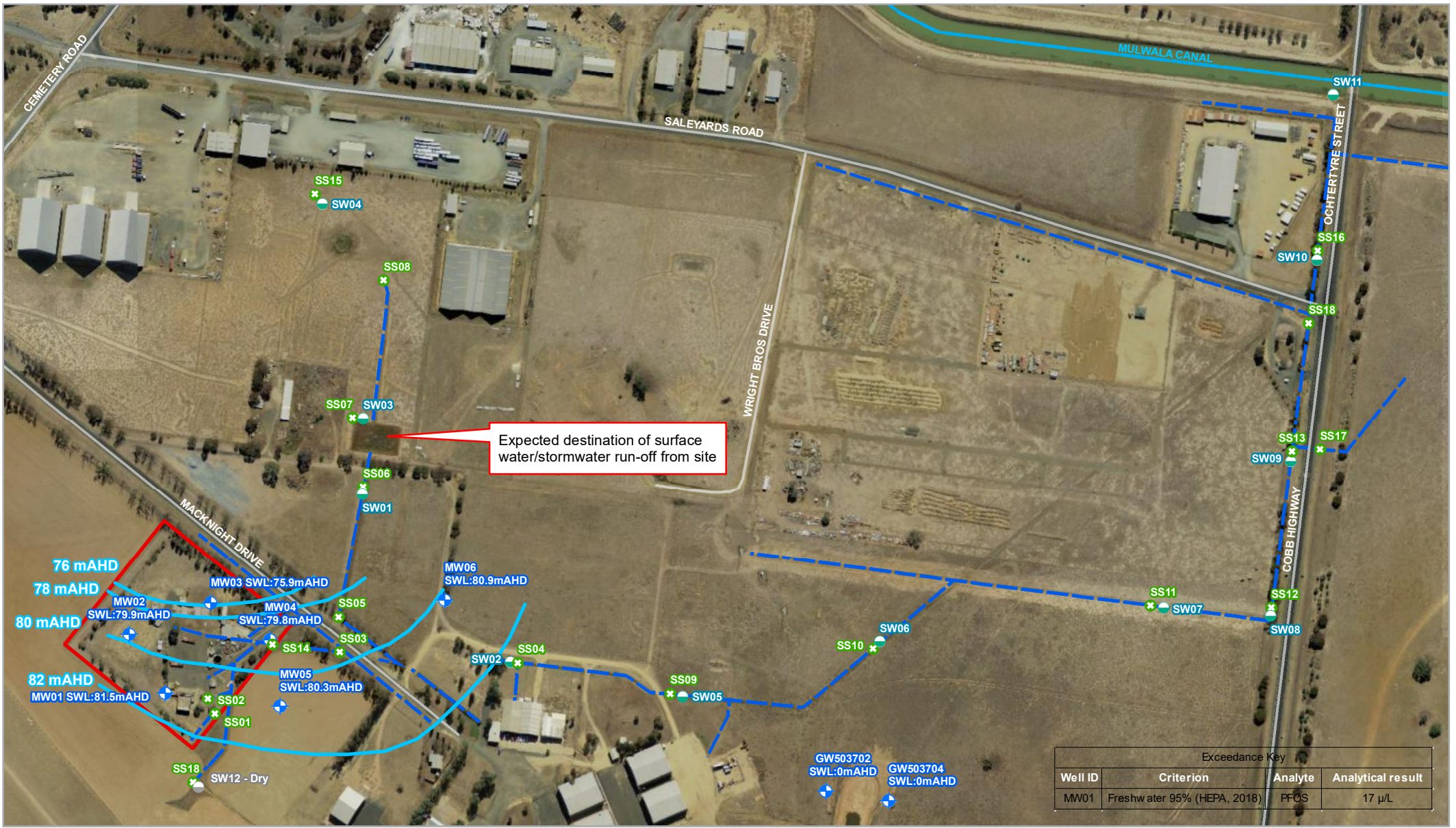
Fire and Rescue NSW
Deniliquin Additional Monitoring

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Date 25/10/2019

Investigation Locations

FIGURE 3

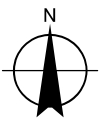
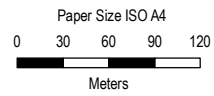
Data source: Aerial Imagery Sixmaps, 2019; Streets, Waterways, NSW LPI 2015 DTDB. Created by: dibanatn



Legend

Sampling Location Type

- Groundwater Monitoring (GHD, 2019)
- Sediment Sample Location (GHD, 2019)
- Surface Water Sample Location (GHD, 2019)
- Surface Water Sample Location, Dry (GHD, 2019)
- Interpolated Groundwater Contours (mAHD)
- Minor Waterways
- Major Waterways
- Streets
- Surface Drainage
- Site Boundary



Map Projection: Transverse Mercator
 Horizontal Datum: GDA 1994
 Grid: GDA 1994 MGA Zone 55

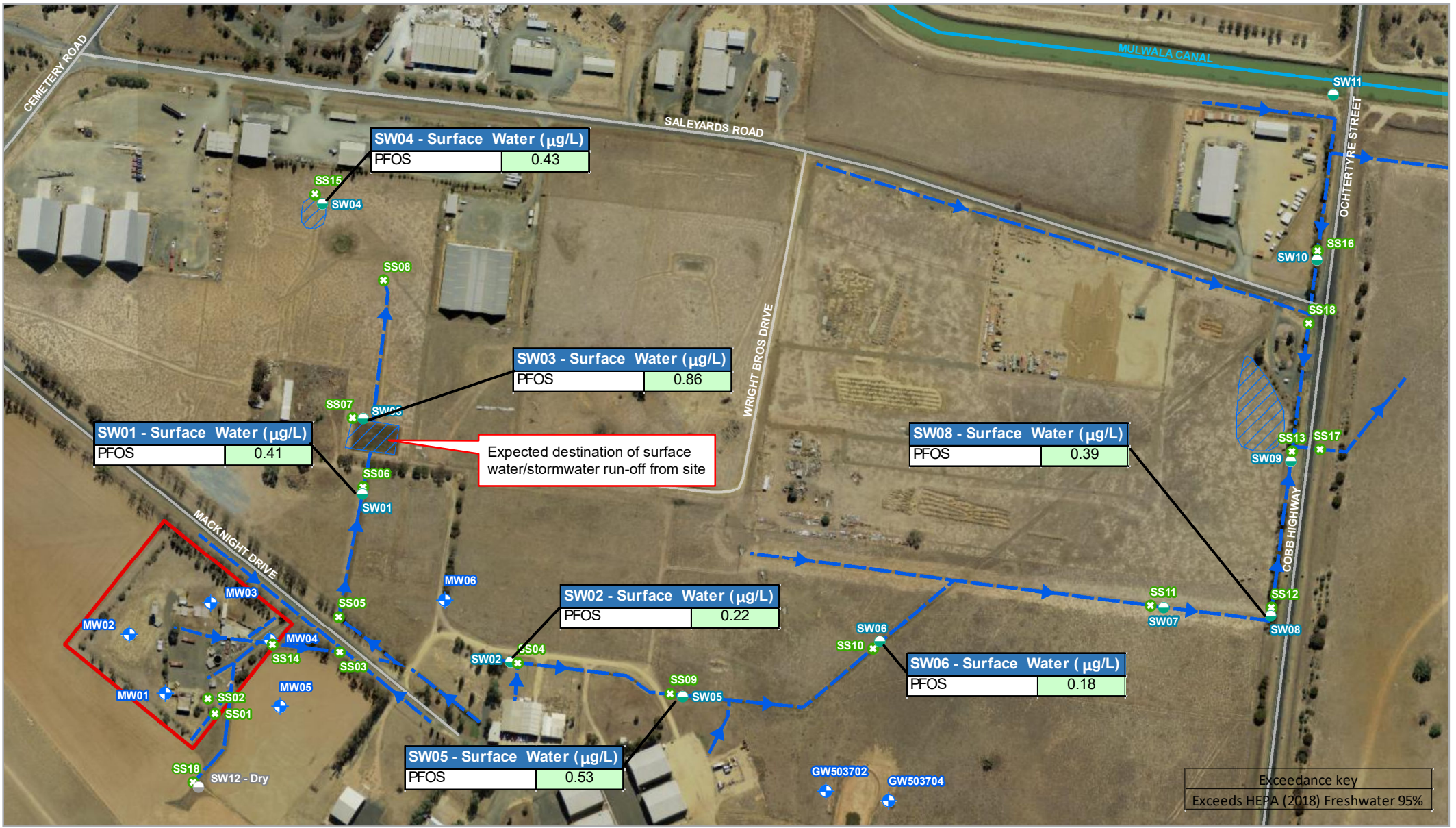
Fire and Rescue NSW
Denilquin Additional Monitoring

**Groundwater contours and
 assessment criteria exceedances**

Project No. 21-28370
 Revision No. A
 Date 28/10/2019

FIGURE 4

Data source: Aerial imagery SIXmaps, 2019; Streets, Waterways, NSW LPI 2015 DTDB. . Created by: ddbanatin

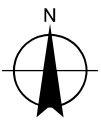
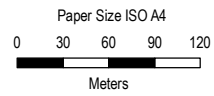


Exceedance key
Exceeds HEPA (2018) Freshwater 95%

Legend

Sampling Location Type

- Groundwater Monitoring (GHD, 2019)
- Sediment Sample Location (GHD, 2019)
- Surface Water Sample Location (GHD, 2019)
- Surface Water Sample Location, Dry (GHD, 2019)
- Minor Waterways
- Major Waterways
- Streets
- Surface Drainage
- Surface Water Feature
- Site Boundary



Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

Fire and Rescue NSW
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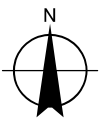
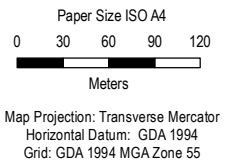
**Surface water assessment
criteria exceedances**

FIGURE 5

Data source: Aerial imagery SIXmaps, 2019; Streets, Waterways, NSW LPI 2015 DTDB. . Created by: ddbanatin



Legend	
	Groundwater Monitoring (GHD, 2019)
	Sediment Sample Location (GHD, 2019)
	Surface Water Sample Location (GHD, 2019)
	Surface Water Sample Location, Dry (GHD, 2019)
	Minor Waterways
	Major Waterways
	Streets
	Surface Drainage
	Surface Water Feature
	Site Boundary



Fire and Rescue NSW
Deniliquin Additional Monitoring

**Sediment assessment
criteria exceedances**

Project No. 21-28370
Revision No. A
Date 28/10/2019

FIGURE 6

Data source: Aerial imagery Slixmaps, 2019; Streets, Waterways, NSW LPI 2015 DTDB. . Created by: dibanatn

Appendix B – Analytical results tables



Appendix B
Table 1 - Groundwater analytical reports

	Inorganics		PFAS																	
	Electrical conductivity (lab)	Total Dissolved Solids	Perfluoropropanesulfonic acid (PFPrS)	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorononane sulfonate (PFNS)	Perfluorodecanesulfonic 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)		
EQL	µS/cm	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
PFAS NEMP 2018 Freshwater 95%	1	10	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

Location Code	Field ID	Electrical conductivity (lab)	Total Dissolved Solids	PFPrS	PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFNS	PFDS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA
GW503702	GW503702	8,700	4,600	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
GW503704	GW503704	12,000	7,500	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW01	MW01	2,300	1,300	0.03	0.06	0.04	0.37	0.04	17	0.91	0.03	0.06	0.13	0.26	0.04	0.11	0.04	0.04	0.04
MW02	MW02	1,800	1,100	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW03	MW03	2,600	1,400	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW04	MW04	6,900	3,200	0.06	0.17	0.07	0.03	<0.01	0.02	<0.01	<0.01	0.09	0.24	0.33	0.02	<0.01	<0.01	<0.01	<0.01
MW05	MW05	3,000	1,500	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW06	MW06	13,000	6,700	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Statistics																			
Number of Results	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Number of Detects	8	8	2	2	2	2	1	2	1	1	2	2	2	2	1	1	1	1	0
Maximum Concentration	13,000	7,500	0.06	0.17	0.07	0.37	0.04	17	0.91	0.03	0.09	0.24	0.33	0.04	0.11	0.04	0.04	0.04	<0.01
Average Concentration *	6,288	3,412	0.015	0.032	0.018	0.054	0.0094	2.1	0.12	0.0081	0.038	0.05	0.078	0.011	0.018	0.0094	0.0094	0.0094	0.005
95% UCL (Student's-t) *	9,329	5,139	0.0285	0.0719	0.0339	0.14	0.0177	6.156	0.332	0.014	0.0539	0.109	0.168	0.0198	0.043	0.0177	0.0177	0.0177	0.005

* A Non Detect Multiplier of 0.5 has been applied.

Environmental Standards
HEPA, January 2018, PFAS NEMP 2018 Freshwater 95%



Appendix B
Table 1 - Groundwater analytical reports

	Inorganics		PFAS																			
	Electrical conductivity (lab)	Total Dissolved Solids	Perfluorodecanic acid (PFDoDA)	Perfluorotridecanic acid (PFTriDA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamide ethanol (EtFOSE)	N-Methyl perfluorooctane sulfonamide ethanol (MeFOSE)	N-Methyl perfluorooctane sulfonamide acetic acid (MeFOSAA)	N-Ethyl perfluorooctane sulfonamide acetic acid (EtFOSAA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	PFAS (Sum of Total)	Sum of PFHxS and PFOS	PFAS (Sum of Total)(WA DER List)	Sum of US EPA PFAS (PFOS + PFOA)*	Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	
EQL	µS/cm	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
PFAS NEMP 2018 Freshwater 95%	1	10	0.01	0.01	0.01	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.01	0.05	0.01	0.01	0.1	0.01	0.05	0.01	0.01	

Location Code	Field ID	Electrical conductivity (lab)	Total Dissolved Solids	Perfluorodecanic acid (PFDoDA)	Perfluorotridecanic acid (PFTriDA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamide ethanol (EtFOSE)	N-Methyl perfluorooctane sulfonamide ethanol (MeFOSE)	N-Methyl perfluorooctane sulfonamide acetic acid (MeFOSAA)	N-Ethyl perfluorooctane sulfonamide acetic acid (EtFOSAA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	PFAS (Sum of Total)	Sum of PFHxS and PFOS	PFAS (Sum of Total)(WA DER List)	Sum of US EPA PFAS (PFOS + PFOA)*	Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*
GW503702	GW503702	8,700	4,600	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	<0.1	<0.01	<0.05	<0.01	<0.01
GW503704	GW503704	12,000	7,500	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	<0.1	<0.01	<0.05	<0.01	<0.01
MW01	MW01	2,300	1,300	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	0.29	0.22	<0.01	19.67	17.37	18.54	17.11	17.48
MW02	MW02	1,800	1,100	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	<0.1	<0.01	<0.05	<0.01	<0.01
MW03	MW03	2,600	1,400	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	<0.1	<0.01	<0.05	<0.01	<0.01
MW04	MW04	6,900	3,200	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	1.03	0.05	0.9	0.02	0.05
MW05	MW05	3,000	1,500	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	<0.1	<0.01	<0.05	<0.01	<0.01
MW06	MW06	13,000	6,700	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	<0.1	<0.01	<0.05	<0.01	<0.01

Statistics	Electrical conductivity (lab)	Total Dissolved Solids	Perfluorodecanic acid (PFDoDA)	Perfluorotridecanic acid (PFTriDA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamide ethanol (EtFOSE)	N-Methyl perfluorooctane sulfonamide ethanol (MeFOSE)	N-Methyl perfluorooctane sulfonamide acetic acid (MeFOSAA)	N-Ethyl perfluorooctane sulfonamide acetic acid (EtFOSAA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	PFAS (Sum of Total)	Sum of PFHxS and PFOS	PFAS (Sum of Total)(WA DER List)	Sum of US EPA PFAS (PFOS + PFOA)*	Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	
Number of Results	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Number of Detects	8	8	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	2	2	2	2	2
Maximum Concentration	13,000	7,500	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	0.29	0.22	<0.01	19.67	17.37	18.54	17.11	17.48	
Average Concentration *	6,288	3,412	0.005	0.005	0.005	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.005	0.058	0.032	0.005	2.6	2.2	2.4	2.1	2.2	
95% UCL (Student's-t) *	9,329	5,139	0.005	0.005	0.005	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.005	0.121	0.0828	0.005	7.244	6.292	6.809	6.195	6.332	

* A Non Detect Multiplier of 0.5 has been applied.

Environmental Standards
HEPA, January 2018, PFAS NEMP 2018 Freshwater 95%



Appendix B
Table 2 - Groundwater historical analytical results

Main data table with columns for PFAS compounds (e.g., Perfluoropropanesulfonic acid, Perfluorobutane sulfonic acid, etc.) and rows for various monitoring wells (MW01-MW06) and dates (18/07/2019, 24/01/2017, 2/06/2017, 17/07/2019). Includes a 'Statistics' section at the bottom.

* A Non Detect Multiplier of 0.5 has been applied.

Environmental Standards
HEPA, January 2018, PFAS NEMP 2018 Freshwater 95%



Appendix B
Table 3 - Surface Water analytical results

		PFAS																	
		Perfluoropropanesulfonic acid (PFPrS)	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorononane sulfonate (PFNS)	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)
EQL		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
PFAS NEMP 2018 Freshwater 95%		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

Location Code	Field ID	Perfluoropropanesulfonic acid (PFPrS)	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorononane sulfonate (PFNS)	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)
SW01	SW01	0.01	0.02	<0.01	0.06	<0.01	0.41	<0.01	<0.01	<0.05	0.07	0.07	0.03	0.03	<0.01	<0.01	<0.01	<0.01	<0.01
SW02	SW02	<0.01	0.02	0.01	0.06	<0.01	0.22	<0.01	<0.01	<0.05	0.02	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SW03	SW03	0.01	0.02	0.02	0.15	0.02	0.86	<0.01	<0.01	<0.05	0.09	0.10	0.04	0.03	0.02	<0.01	<0.01	<0.01	<0.01
SW04	SW04	<0.01	<0.01	<0.01	0.03	0.02	0.43	<0.01	<0.01	<0.05	0.05	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SW05	SW05	<0.01	0.02	0.03	0.14	0.01	0.53	<0.01	<0.01	<0.05	0.02	0.04	0.01	0.04	<0.01	<0.01	<0.01	<0.01	<0.01
SW06	SW06	<0.01	0.01	0.01	0.05	0.01	0.18	<0.01	<0.01	<0.05	0.01	0.04	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01
SW07	SW07	<0.01	0.02	0.02	0.05	<0.01	0.04	<0.01	<0.01	<0.05	0.02	0.04	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SW08	SW08	<0.01	0.02	0.02	0.07	<0.01	0.39	<0.01	<0.01	<0.05	0.02	0.03	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01
SW09	SW09	<0.01	0.02	0.02	0.03	<0.01	<0.01	<0.01	<0.01	<0.05	0.02	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SW10	SW10	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SW11	SW11	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Statistics																			
Number of Results	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Number of Detects	2	8	7	9	4	9	0	0	0	9	9	9	3	6	1	0	0	0	0
Maximum Concentration	0.01	0.02	0.03	0.15	0.02	0.86	<0.01	<0.01	<0.05	0.09	0.1	0.04	0.04	0.04	0.02	<0.01	<0.01	<0.01	<0.01
Average Concentration *	0.0059	0.015	0.014	0.059	0.0086	0.28	0.005	0.005	0.025	0.03	0.036	0.011	0.016	0.016	0.0064	0.005	0.005	0.005	0.005
95% UCL (Student's-t) *	0.00701	0.0189	0.0184	0.0851	0.0119	0.43	0.005	0.005	0.025	0.0452	0.0516	0.0176	0.0229	0.0229	0.00884	0.005	0.005	0.005	0.005

* A Non Detect Multiplier of 0.5 has been applied.

Environmental Standards
HEPA, January 2018, PFAS NEMP 2018 Freshwater 95%



Appendix B
Table 3 - Surface Water analytical results

	Perfluoropropanesulfonic acid (PFPS)	Perfluorobutane sulfonic acid (PFBS)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	PFAS								
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	PFAS (Sum of Total)	Sum of PFHxS and PFOS	PFAS (Sum of Total)(WA DER List)	Sum of US EPA PFAS (PFOS + PFOA)*	Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*
EQL	0.01	0.01	0.01	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.01	0.05	0.01	0.01	0.1	0.01	0.05	0.01	0.01
PFAS NEMP 2018 Freshwater 95%																			

Location Code	Field ID	Perfluoropropanesulfonic acid (PFPS)	Perfluorobutane sulfonic acid (PFBS)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	PFAS (Sum of Total)	Sum of PFHxS and PFOS	PFAS (Sum of Total)(WA DER List)	Sum of US EPA PFAS (PFOS + PFOA)*	Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*
SW01	SW01	0.01	0.02	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	0.7	0.47	0.69	0.44	0.5
SW02	SW02	<0.01	0.02	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	0.35	0.28	0.34	0.22	0.28
SW03	SW03	0.01	0.02	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	1.36	1.01	1.29	0.89	1.04
SW04	SW04	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	0.55	0.46	0.53	0.43	0.46
SW05	SW05	<0.01	0.02	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	0.84	0.67	0.8	0.57	0.71
SW06	SW06	<0.01	0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	0.33	0.23	0.31	0.2	0.25
SW07	SW07	<0.01	0.02	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	0.2	0.09	0.18	0.05	0.1
SW08	SW08	<0.01	0.02	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	0.57	0.46	0.55	0.41	0.48
SW09	SW09	<0.01	0.02	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	0.12	0.03	0.1	<0.01	0.03
SW10	SW10	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	<0.1	0.02	<0.05	0.02	0.02
SW11	SW11	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	<0.1	<0.01	<0.05	<0.01	<0.01

Statistics

Number of Results	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Number of Detects	2	8	0	0	0	0	0	0	0	0	0	0	0	0	9	10	9	9	10	
Maximum Concentration	0.01	0.02	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	1.36	1.01	1.29	0.89	1.04
Average Concentration *	0.0059	0.015	0.005	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.005	0.025	0.005	0.005	0.47	0.34	0.44	0.29	0.35
95% UCL (Student's-t) *	0.00701	0.0189	0.005	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.005	0.025	0.005	0.005	0.683	0.511	0.651	0.449	0.531

* A Non Detect Multiplier of 0.5 has been applied.

Environmental Standards

HEPA, January 2018, PFAS NEMP 2018 Freshwater 95%

Table 4 - Surface water historical analytical results

		PFAS																		
		Perfluoropropanesulfonic acid (PFPrS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorobutane sulfonic acid (PFBS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluorooctane sulfonic acid (PFOS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorononane sulfonate (PFNS)	Perfluorodecanesulfonic 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)	
EQL		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
PFAS NEMP 2018 Freshwater 95%						0.13								220						

Site ID	Location Code	Field ID	Date	Perfluoropropanesulfonic acid (PFPrS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorobutane sulfonic acid (PFBS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluorooctane sulfonic acid (PFOS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorononane sulfonate (PFNS)	Perfluorodecanesulfonic 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)		
Deniliquin Airport	SW01	SW01	29/11/2016		0.06	0.07	0.39	2.01	0.02		<0.02	<0.1	0.21	0.19	0.04	0.06	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
			18/07/2019	0.01	<0.01	0.02	0.06	0.41	<0.01	<0.01	<0.05	0.07	0.07	0.03	0.03	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW02	SW02	29/11/2016		<0.02	<0.02	<0.02	0.20	<0.02		<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	
			18/05/2017		0.04	0.05	0.20	0.56	<0.02	<0.02	<0.1	<0.02	0.03	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
			17/07/2019	<0.01	0.01	0.02	0.06	0.22	<0.01	<0.01	<0.05	0.02	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW03	SW03	29/11/2016		0.07	0.06	0.31	1.32	<0.02		<0.02	<0.1	0.20	0.40	0.02	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
			18/05/2017		0.10	0.09	0.58	2.09	<0.02	<0.02	<0.1	0.35	0.33	0.14	0.09	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
			16/07/2019	0.01	0.02	0.02	0.15	0.86	0.02	<0.01	<0.01	<0.05	0.09	0.10	0.04	0.03	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW04	SW04	18/05/2017		<0.02	<0.02	<0.02	0.26	<0.02		<0.02	<0.1	<0.02	<0.02	0.03	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
			16/07/2019	<0.01	<0.01	<0.01	0.03	0.43	0.02	<0.01	<0.01	<0.05	0.05	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW05	SW05	18/07/2019	<0.01	0.03	0.02	0.14	0.53	0.01	<0.01	<0.01	<0.05	0.02	0.04	0.01	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
	SW06	SW06	18/05/2017		<0.02	<0.02	0.08	0.16	<0.02		<0.02	<0.1	<0.02	0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
			18/07/2019	<0.01	0.01	0.01	0.05	0.18	0.01	<0.01	<0.01	<0.05	0.01	0.04	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW07	SW07	18/07/2019	<0.01	0.02	0.02	0.05	0.04	<0.01	<0.01	<0.01	<0.05	0.02	0.04	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
	SW08	SW08	18/05/2017		<0.02	0.03	0.12	0.19	<0.02		<0.02	<0.1	<0.02	0.03	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
			16/07/2019	<0.01	0.02	0.02	0.07	0.39	<0.01	<0.01	<0.01	<0.05	0.02	0.03	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	SW09	SW09	16/07/2019	<0.01	0.02	0.02	0.03	<0.01	<0.01	<0.01	<0.01	<0.05	0.02	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
	SW10	SW10	18/05/2017		<0.02	<0.02	0.04	0.05	<0.02		<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
16/07/2019			<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
SW11	SW11	18/05/2017		<0.02	<0.02	<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	<0.02	<0.02	
		18/07/2019	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	

Statistics																					
Number of Results	11	21	21	21	21	21	11	21	21	21	21	21	21	21	21	21	21	21	21	21	21
Number of Detects	2	11	13	16	18	5	0	0	0	12	15	7	10	2	0	0	0	0	0	0	0
Maximum Concentration	0.01	0.1	0.09	0.58	2.09	0.02	<0.01	<0.02	<0.1	0.35	0.4	0.14	0.09	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Geometric Average *	0.0057	0.015	0.017	0.053	0.16	0.0088	0.005	0.007	0.035	0.023	0.031	0.011	0.012	0.0079	0.007	0.007	0.007	0.007	0.007	0.007	0.007
% of Results at or above the Detect Limit	18	52	62	76	86	24	0	0	0	57	71	33	48	10	0	0	0	0	0	0	0

* A Non Detect Multiplier of 0.5 has been applied.

Environmental Standards
 HEPA, January 2018, PFAS NEMP 2018 Freshwater 95%

Table 4 - Surface water historical analytical results

	Perfluorotetradecanoic acid (PFTeDA)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	N-Methyl perfluorooctane sulfonamidoethanol (MEFOSE)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	PFAS									
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	PFAS (Sum of Total)	Sum of PFHxS and PFOS	PFAS (Sum of Total)(WA DER List)	Sum of US EPA PFAS (PFOS + PFOA)*	Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	
EQL	0.01	0.02	0.05	0.05	0.05	0.05	0.02	0.02	0.01	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.01	
PFAS NEMP 2018 Freshwater 95%																		

Site ID	Location Code	Field ID	Date	Perfluorotetradecanoic acid (PFTeDA)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	N-Methyl perfluorooctane sulfonamidoethanol (MEFOSE)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	PFAS (Sum of Total)	Sum of PFHxS and PFOS	PFAS (Sum of Total)(WA DER List)	Sum of US EPA PFAS (PFOS + PFOA)*	Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	
Deniliquin Airport	SW01	SW01	29/11/2016	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	0.13	<0.05	<0.05	3.18	2.40	3.10			
			18/07/2019	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	0.7	0.47	0.69	0.44
	SW02	SW02	29/11/2016	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	0.20	0.20	0.20		
			18/05/2017	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	0.89	0.76	0.85	
	SW03	SW03	17/07/2019	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	0.35	0.28	0.34	0.22	0.28
			29/11/2016	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.09	<0.05	<0.05	2.52	1.63	2.45	
	SW04	SW04	18/05/2017	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	0.25	<0.05	<0.05	4.06	2.67	3.92		
			16/07/2019	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	1.36	1.01	1.29	0.89	1.04
	SW05	SW05	18/05/2017	<0.05	<0.02	<0.05	<0.05	0.08	<0.05	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	0.37	0.26	0.29		
			16/07/2019	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	0.55	0.46	0.53	0.43	0.46
	SW06	SW06	18/07/2019	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	0.84	0.67	0.8	0.57	0.71
			18/05/2017	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	0.26	0.24	0.26		
	SW07	SW07	18/07/2019	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	0.33	0.23	0.31	0.2	0.25
			18/07/2019	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	0.2	0.09	0.18	0.05	0.1
	SW08	SW08	18/05/2017	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	0.37	0.31	0.37		
			16/07/2019	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	0.57	0.46	0.55	0.41	0.48
	SW09	SW09	16/07/2019	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	0.12	0.03	0.1	<0.01	0.03
			18/05/2017	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	0.09	0.09	0.09		
	SW10	SW10	16/07/2019	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	<0.1	0.02	<0.05	0.02	0.02
			18/05/2017	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01		
SW11	SW11	18/05/2017	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01			
		18/07/2019	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	<0.1	<0.01	<0.05	<0.01	<0.01	

Statistics																				
Number of Results	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	11	11
Number of Detects	0	0	0	0	1	0	0	0	0	3	0	0	0	0	18	19	18	9	10	
Maximum Concentration	<0.05	<0.05	<0.05	<0.05	0.08	<0.05	<0.05	<0.05	<0.05	0.25	<0.05	<0.05	<0.05	4.06	2.67	3.92	0.89	1.04		
Geometric Average *	0.011	0.016	0.025	0.025	0.026	0.025	0.016	0.016	0.011	0.032	0.011	0.011	0.34	0.22	0.31	0.11	0.16			
% of Results at or above the Detect Limit	0	0	0	0	5	0	0	0	0	14	0	0	86	90	86	82	91			

* A Non Detect Multiplier of 0.5 has been applied.

Environmental Standards
 HEPA, January 2018, PFAS NEMP 2018 Freshwater 95%



Appendix B
Table 5 - Sediment analytical results

				Inorganics	TOC	PFAS																		
				Moisture Content (%)	Total Organic Carbon	Perfluoropropanesulfonic acid (PFPrS)	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorononane sulfonate (PFNS)	Perfluorodecanesulfonic 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)			
EQL				%	%	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg		
PFAS NEMP 2018 Health Industrial/Commercial				1	0.1	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	
PFAS NEMP 2018 Interim Ecological Indirect Exposure Commercial/Industrial										140								50,000						
Site ID	Location Code	Field ID	Date																					
Deniliquin Airport	SS01	SS01	17/07/2019	16	0.8	11	30	25	170	9.6	5,000	150	40	24	39	110	12	36	6.2	11	<5			
	SS02	SS02	17/07/2019	13	0.8	<5	9.9	6.8	52	<5	1,600	76	120	8.9	15	26	7.7	24	<5	17	12			
	SS03	SS03	18/07/2019	50	8.2	<5	<5	<5	<5	<5	37	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5		
	SS04	SS04	17/07/2019	31	1.4	<5	<5	<5	<5	<5	12	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	
	SS05	SS05	18/07/2019	36	1.0	<5	<5	<5	<5	<5	52	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	
	SS06	SS06	18/07/2019	40	1.3	<5	<5	<5	<5	<5	44	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	SS07	SS07	16/07/2019	44	0.3	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	SS08	SS08	16/07/2019	30	1.2	<5	<5	<5	<5	<5	55	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	SS09	SS09	18/07/2019	43	4.2	<5	<5	<5	<5	<5	25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	SS10	SS10	18/07/2019	32	1.0	<5	<5	<5	<5	<5	6.6	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	SS11	SS11	18/07/2019	37	0.6	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	SS12	SS12	16/07/2019	31	1.9	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	SS13	SS13	16/07/2019	32	0.9	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	SS14	SS14	17/07/2019	56	8.8	<5	<5	<5	<5	<5	40	<5	<5	<5	16	<5	<5	<5	<5	<5	<5	<5	<5	<5
	SS15	SS15	16/07/2019	40	5.5	<5	<5	<5	<5	<5	52	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	SS16	SS16	16/07/2019	32	2.2	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	SS17	SS17	16/07/2019	35	0.3	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	SS18	SS18	16/07/2019	34	2.4	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	SS19	SS19	18/07/2019	15	3.9	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Statistics																								
Number of Results				19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	
Number of Detects				19	19	1	2	2	2	1	11	2	2	3	2	2	2	2	2	1	2	1	1	
Maximum Concentration				56	8.8	11	30	25	170	9.6	5,000	150	120	24	39	110	12	36	6.2	17	12	12		
Average Concentration *				34	2.5	2.9	4.3	3.9	14	2.9	365	14	11	4.7	5.1	9.4	3.3	5.4	2.7	3.7	3	3		
95% UCL (Student's-t) *				38.43	3.472	3.723	6.899	5.98	29.62	3.522	834.6	28.83	21.73	6.967	8.54	19.32	4.239	8.935	3.032	5.207	3.867	3.867		

* A Non Detect Multiplier of 0.5 has been applied.

Environmental Standards

HEPA, January 2018, PFAS NEMP 2018 Health Industrial/Commercial

HEPA, January 2018, PFAS NEMP 2018 Interim Ecological Indirect Exposure Commercial/Industrial



Appendix B
Table 5 - Sediment analytical results

				PFAS																				
Site ID	Location Code	Field ID	Date	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTTDA)	Perfluorotetradecanoic acid (PFTTeDA)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Ethyl perfluorooctane sulfonamide (EiFOSA)	N-Ethyl perfluorooctane sulfonamidoethanol (EiFOSE)	N-Methyl perfluorooctane sulfonamidoethanol (MEFOSE)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EiFOSAA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	PFAS (Sum of Total)	Sum of PFHxS and PFOS	PFAS (Sum of Total)(WA DER List)	Sum of US EPA PFAS (PFOS + PFOA)*	Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*		
EQL				5	5	5	5	5	5	5	5	10	10	5	10	5	5	5	50	5	10	5	5	
PFAS NEMP 2018 Health Industrial/Commercial																				20,000				
PFAS NEMP 2018 Interim Ecological Indirect Exposure Commercial/Industrial																								
Denilquin Airport	SS01	SS01	17/07/2019	<5	<5	<5	58	<5	<5	<5	<5	<10	<10	<5	93	<5	54	5,878.8	5,170	5,514	5,036	5,206		
	SS02	SS02	17/07/2019	11	<5	<5	59	<5	<5	<5	<5	<10	<10	<5	39	85	<5	2,169.3	1,652	1,867.5	1,624	1,676		
	SS03	SS03	18/07/2019	<5	<5	<5	<5	<5	<5	<5	<5	<10	<10	<5	<10	<5	<5	<50	37	37	37	37		
	SS04	SS04	17/07/2019	<5	<5	<5	<5	<5	<5	<5	<5	<10	<10	<5	<10	<5	<5	<50	12	12	12	12		
	SS05	SS05	18/07/2019	<5	<5	<5	<5	<5	<5	<5	<5	<10	<10	<5	<10	<5	<5	<50	52	52	52	52		
	SS06	SS06	18/07/2019	<5	<5	<5	<5	<5	<5	<5	<5	<10	<10	<5	<10	<5	<5	<50	44	44	44	44		
	SS07	SS07	16/07/2019	<5	<5	<5	<5	<5	<5	<5	<5	<10	<10	<5	<10	<5	<5	<50	<5	<10	<5	<5		
	SS08	SS08	16/07/2019	<5	<5	<5	<5	<5	<5	<5	<5	<10	<10	<5	<10	<5	<5	<50	55	55	55	55		
	SS09	SS09	18/07/2019	<5	<5	<5	<5	<5	<5	<5	<5	<10	<10	<5	<10	<5	<5	<50	25	25	25	25		
	SS10	SS10	18/07/2019	<5	<5	<5	<5	<5	<5	<5	<5	<10	<10	<5	<10	<5	<5	<50	6.6	<10	6.6	6.6		
	SS11	SS11	18/07/2019	<5	<5	<5	<5	<5	<5	<5	<5	<10	<10	<5	<10	<5	<5	<50	<5	<10	<5	<5		
	SS12	SS12	16/07/2019	<5	<5	<5	<5	<5	<5	<5	<5	<10	<10	<5	<10	<5	<5	<50	<5	<10	<5	<5		
	SS13	SS13	16/07/2019	<5	<5	<5	<5	<5	<5	<5	<5	<10	<10	<5	<10	<5	<5	<50	<5	<10	<5	<5		
	SS14	SS14	17/07/2019	<5	<5	<5	<5	<5	<5	<5	<5	<10	<10	<5	<10	<5	<5	<50	40	56	40	40		
	SS15	SS15	16/07/2019	<5	<5	<5	<5	<5	<5	<5	<5	<10	<10	<5	<10	<5	<5	<50	52	52	52	52		
	SS16	SS16	16/07/2019	<5	<5	<5	<5	<5	<5	<5	<5	<10	<10	<5	<10	<5	<5	<50	<5	<10	<5	<5		
	SS17	SS17	16/07/2019	<5	<5	<5	<5	<5	<5	<5	<5	<10	<10	<5	<10	<5	<5	<50	<5	<10	<5	<5		
	SS18	SS18	16/07/2019	<5	<5	<5	<5	<5	<5	<5	<5	<10	<10	<5	<10	<5	<5	<50	<5	<10	<5	<5		
	SS19	SS19	18/07/2019	<5	<5	<5	<5	<5	<5	<5	<5	<10	<10	<5	<10	<5	<5	<50	<5	<10	<5	<5		

Statistics																					
Number of Results	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
Number of Detects	1	0	0	2	0	0	0	0	0	0	0	2	1	1	6	11	10	11	11	11	11
Maximum Concentration	11	<5	<5	59	<5	<5	<5	<5	<5	<10	<10	93	85	54	5,878.8	5,170	5,514	5,036	5,206	5,206	
Average Concentration *	2.9	2.5	2.5	8.4	2.5	2.5	2.5	2.5	2.5	5	5	2.5	11	6.8	5.2	452	377	408	369	380	380
95% UCL (Student's-t) *	3.723	2.5	2.5	15.42	2.5	2.5	2.5	2.5	2.5	5	5	2.5	19.87	14.37	9.911	1,010	862.3	928.3	841.5	869.1	869.1

* A Non Detect Multiplier of 0.5 has been applied.

Environmental Standards

HEPA, January 2018, PFAS NEMP 2018 Health Industrial/Commercial

HEPA, January 2018, PFAS NEMP 2018 Interim Ecological Indirect Exposure Commercial/Industrial



Appendix B
Table 5b - Sediment ASLP analytical results

EQL	Inorganics	Leachate		PFAS																	
	pH of Leaching Fluid	pH (Initial)	pH (Final)	Perfluoropropanesulfonic acid (PFPS)	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluorheptane sulfonic acid (PFHpS)	Perfluorodecanesulfonic acid (PFDS)	Perfluorononane sulfonate (PFNS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluorheptanoic acid (PFHpA)	Perfluorononanoic acid (PFNA)	Perfluorooctanoic acid (PFOA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDDoDA)	
	pH Units	pH Units	pH Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL	0.1	0.1	0.1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

Location Code	Sample Type	Matrix Type	pH	pH	pH	Perfluoropropanesulfonic acid (PFPS)	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluorheptane sulfonic acid (PFHpS)	Perfluorodecanesulfonic acid (PFDS)	Perfluorononane sulfonate (PFNS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluorheptanoic acid (PFHpA)	Perfluorononanoic acid (PFNA)	Perfluorooctanoic acid (PFOA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDDoDA)
SS01	Normal	soil	7.0	7.2	7.8	0.57	1.3	1.1	7.1	0.24	<0.1	4.4	510	1.3	2.2	5.5	0.50	0.27	1.3	0.51	<0.1	<0.1
SS02	Normal	soil	7.0	7.1	7.5	0.15	0.41	0.33	2.7	0.11	<0.5	2.6	87	0.30	0.73	1.3	0.42	0.13	1.0	0.64	0.17	<0.1
SS03	Normal	soil	7.0	6.6	7.0	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	0.39	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SS04	Normal	soil	7.0	6.8	7.0	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.16	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SS05	Normal	soil	7.0	7.6	7.6	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	0.03	1.0	<0.05	<0.01	<0.01	<0.01	0.03	0.02	<0.01	<0.01	<0.01
SS06	Normal	soil	7.0	7.8	7.7	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.76	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SS07	Normal	soil	7.0	8.9	9.4	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SS08	Normal	soil	7.0	7.5	7.8	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	0.02	1.9	<0.05	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01
SS09	Normal	soil	7.0	6.8	7.0	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.22	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SS10	Normal	soil	7.0	6.8	7.4	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.08	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SS11	Normal	soil	7.0	7.4	8.0	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.04	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SS12	Normal	soil	7.0	7.3	7.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.09	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SS13	Normal	soil	7.0	7.8	7.4	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SS14	Normal	soil	7.0	6.7	6.8	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	<0.01	0.50	<0.05	0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01
SS15	Normal	soil	7.0	7.3	7.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1.3	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SS16	Normal	soil	7.0	7.3	7.8	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SS17	Normal	soil	7.0	8.5	8.4	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SS18	Normal	soil	7.0	8.0	7.8	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.06	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SS19	Normal	soil	7.0	7.4	7.2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Statistics																					
Number of Results	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
Number of Detects	19	19	19	2	2	2	6	2	0	5	18	2	3	2	2	4	3	3	1	0	
Maximum Concentration	7	8.9	9.4	0.57	1.3	1.1	7.1	0.24	<0.5	4.4	510	1.3	2.2	5.5	0.5	0.27	1.3	0.64	0.17	<0.1	
Median Concentration *	7	7.3	7.5	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.16	0.025	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005

* A Non Detect Multiplier of 0.5 has been applied.



Appendix B
Table 5b - Sediment ASLP analytical results

EQ	Inorganics			Leachate			PFAS															
	pH of Leaching Fluid	pH (Initial)	pH (Final)	Perfluorotridecanoic acid (PFTTDA)	Perfluorotetradecanoic acid (PFTTeDA)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Ethyl perfluorooctane sulfonamide (EiFOSA)	N-Ethyl perfluorooctane sulfonamide ethanol (EiFOSE)	N-Methyl perfluorooctane sulfonamide ethanol (MEFOSE)	N-Methyl perfluorooctane sulfonamide acetic acid (MeFOSAA)	N-Ethyl perfluorooctane sulfonamide acetic acid (EiFOSAA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	PFAS (Sum of Total)	Sum of PFHxS and PFOS	PFAS (Sum of Total)(WA DER List)	Sum of US EPA PFAS (PFOS + PFOA)*	Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	
	pH Units	pH Units	pH Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQ	0.1	0.1	0.1	0.01	0.01	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.01	0.05	0.01	0.01	0.1	0.01	0.05	0.01	0.01	

Location Code	Sample Type	Matrix Type	pH	pH	pH	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
SS01	Normal	soil	7.0	7.2	7.8	<0.1	<0.1	1.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	6.5	22	0.63	566.42	517.1	557.7	511.3	518.4
SS02	Normal	soil	7.0	7.1	7.5	<0.1	<0.1	0.56	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	3.2	3.6	2.0	107.35	89.7	100.66	88	90.7
SS03	Normal	soil	7.0	6.6	7.0	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	0.4	0.4	0.4	0.39	0.4
SS04	Normal	soil	7.0	6.8	7.0	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	0.16	0.16	0.16	0.16	0.16
SS05	Normal	soil	7.0	7.6	7.6	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	1.09	1.01	1.03	1.02	1.03
SS06	Normal	soil	7.0	7.8	7.7	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	0.77	0.76	0.76	0.76	0.76
SS07	Normal	soil	7.0	8.9	9.4	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	<0.1	0.03	<0.05	0.03	0.03
SS08	Normal	soil	7.0	7.5	7.8	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	1.95	1.91	1.91	1.9	1.91
SS09	Normal	soil	7.0	6.8	7.0	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	0.22	0.22	0.22	0.22	0.22
SS10	Normal	soil	7.0	6.8	7.4	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	<0.1	0.08	0.08	0.08	0.08
SS11	Normal	soil	7.0	7.4	8.0	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	<0.1	0.04	<0.05	0.04	0.04
SS12	Normal	soil	7.0	7.3	7.1	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	<0.1	0.09	0.09	0.09	0.09
SS13	Normal	soil	7.0	7.8	7.4	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	<0.1	0.05	0.05	0.05	0.05
SS14	Normal	soil	7.0	6.7	6.8	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	0.02	<0.01	0.58	0.53	0.56	0.5	0.53
SS15	Normal	soil	7.0	7.3	7.1	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	1.3	1.3	1.3	1.3	1.3
SS16	Normal	soil	7.0	7.3	7.8	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	<0.1	0.02	<0.05	0.02	0.02
SS17	Normal	soil	7.0	8.5	8.4	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	<0.1	<0.01	<0.05	<0.01	<0.01
SS18	Normal	soil	7.0	8.0	7.8	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	<0.1	0.06	0.06	0.06	0.06
SS19	Normal	soil	7.0	7.4	7.2	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	<0.1	0.03	<0.05	0.03	0.03

Statistics																						
Number of Results	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	
Number of Detects	19	19	19	0	0	2	0	0	0	0	0	0	0	0	2	3	2	10	18	14	18	18
Maximum Concentration	7	8.9	9.4	<0.1	<0.1	1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	6.5	22	2	566.42	517.1	557.7	511.3	518.4
Median Concentration *	7	7.3	7.5	0.005	0.005	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.005	0.025	0.005	0.005	0.16	0.16	0.16	0.16

* A Non Detect Multiplier of 0.5 has been applied.



Appendix B
Table 7 - Fire truck analytical results

		PFAS																			
		Perfluoropropanesulfonic acid (PFPrS)	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorononane sulfonate (PFNS)	Perfluorodecanesulfonic 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)	Perfluorooctane sulfonamide (FOSA)
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.05
Location Code	Field ID	Date																			
10492_Firetruck	10492_RNCBF0	18/07/2019	170	250	<100	330	<100	1,900	<100	<100	<100	900	130	190	<100	<100	<100	<100	<100	<100	<100
	10492_RNSD1	18/07/2019	0.03	0.03	0.02	0.05	<0.01	0.18	<0.01	<0.01	0.12	0.30	0.28	0.04	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	10492_RNSD2	18/07/2019	<0.01	<0.01	<0.01	0.01	<0.01	0.30	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05
Statistics																					
Number of Results		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Number of Detects		2	2	1	3	0	3	0	0	1	1	2	2	2	0	0	0	0	0	0	0
Minimum Concentration		<0.01	<0.01	<0.01	0.01	<0.01	0.18	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05
Maximum Concentration		170	250	<100	330	<100	1,900	<100	<100	<100	<100	900	130	190	<100	<100	<100	<100	<100	<100	<100
Average Concentration *		57	83	17	110	17	633	17	17	17	17	300	43	63	17	17	17	17	17	17	17

* A Non Detect Multiplier of 0.5 has been applied.



Appendix B
Table 7 - Fire truck analytical results

			PFAS															
	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	N-Methyl perfluorooctane sulfonamidoethanol (MEFOSE)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	PFAS (Sum of Total)	Sum of PFHxS and PFOS	PFAS (Sum of Total)(WA DER List)	Sum of US EPA PFAS (PFOS + PFOA)*	Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*			
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L			
EQL	0.05	0.05	0.05	0.05	0.05	0.05	0.01	0.05	0.01	0.01	0.1	0.01	0.05	0.01	0.01			
Location Code	Field ID	Date																
10492_Firetruck	10492_RNCBF0	18/07/2019	<100	<100	<100	<100	<100	<100	<100	<100	16,000	830	<100	20,700	2,230	20,530	2,090	2,420
	10492_RNSD1	18/07/2019	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	1.2	0.25	<0.01	2.55	0.23	2.5	0.23	0.28
	10492_RNSD2	18/07/2019	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	0.02	<0.01	0.33	0.31	0.33	0.3	0.31
Statistics																		
Number of Results			3	3	3	3	3	3	3	3	3	3	3	3	3			
Number of Detects			0	0	0	0	0	0	0	0	2	3	0	3	3			
Minimum Concentration			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	0.02	<0.01	0.33	0.23			
Maximum Concentration			<100	<100	<100	<100	<100	<100	<100	<100	16,000	830	<100	20,700	2,230			
Average Concentration *			17	17	17	17	17	17	17	17	5,334	277	17	6,901	744			

* A Non Detect Multiplier of 0.5 has been applied.



Appendix B
Table 8 - Rinsate blanks - analytical results

2128370 - Additional Monitoring Deniliquin

Site ID	Field ID	Lab Report Number	Matrix Type	Perfluoropropanesulfonic acid (PFPS)	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorononane sulfonate (PFNS)	Perfluorodecanesulfonic 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)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorodecane sulfonamidoethanol (EIFOSE)	N-Methyl perfluorodecane sulfonamidoethanol (MEFOSE)	N-Methyl perfluorodecane sulfonamidacetic acid (MeFOSAA)	N-Ethyl perfluorodecane sulfonamidacetic acid (EtFOSAA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	PFAS (Sum of Total)	Sum of PFHxS and PFOS	PFAS (Sum of Total)(WA DER List)	Sum of USEPA PFAS (PFOS + PFOA)*	Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*				
Deniliquin Airport	RIN01	666984	water	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	<0.1	<0.01	<0.05	<0.01	<0.01



	Unit	EQL	Field ID		RPD	Date		RPD
			MW02	GWBD01		MW02	GWSD01	
			17/07/2019			17/07/2019	23/07/2019	
			Lab Report Number	666984		666984	ES1923114	
Matrix Type	water	water		water	water			
Inorganics								
Electrical conductivity (lab)	µS/cm	1	1,800		1,800			
Total Dissolved Solids	mg/L	10	1,100		1,100			
PFAS								
Perfluoropropanesulfonic acid (PFPrS)	µg/L	0.01	<0.01	<0.01	0	<0.01		
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononane sulfonate (PFNS)	µg/L	0.01	<0.01	<0.01	0	<0.01		
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0
Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.1	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.05	0
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.05	<0.05	0	<0.05	<0.02	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoethanol (MEFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.05	<0.05	0	<0.05	<0.02	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.05	<0.05	0	<0.05	<0.02	0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.05	0
6:2 Fluorotelomer Sulfonate (6:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.05	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.05	0
PFAS (Sum of Total)	µg/L	0.01	<0.1	<0.1	0	<0.1	<0.01	0
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0
PFAS (Sum of Total)(WA DER List)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0
Sum of US EPA PFAS (PFOS + PFOA)*	µg/L	0.01	<0.01	<0.01	0	<0.01		
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	µg/L	0.01	<0.01	<0.01	0	<0.01		

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

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

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



Appendix B

Table 10 - QA/QC - RPD calculations for surface water

	Unit	EQL	Field ID		RPD	SW10		RPD	SW11		RPD	SW11		RPD
			SW10	SWBD01		SW10	SWSD01		SW11	SWBD02		SW11	SWSD02	
			Date			Date			Date			Date		
			Lab Report Number			Lab Report Number			Lab Report Number			Lab Report Number		
Inorganics														
Electrical conductivity (lab)	µS/cm	1												
Total Dissolved Solids	mg/L	10												
PFAS														
Perfluoropropanesulfonic acid (PFPrS)	µg/L	0.01	<0.01	<0.01	0	<0.01			<0.01	<0.01	0	<0.01		
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0	<0.01	<0.01	0	<0.01	<0.02	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0	<0.01	<0.01	0	<0.01	<0.02	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0	<0.01	<0.01	0	<0.01	<0.02	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0	<0.01	<0.01	0	<0.01	<0.02	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	0.02	0.03	40	0.02	0.02	0	<0.01	<0.01	0	<0.01	0.05	133
Perfluorononane sulfonate (PFNS)	µg/L	0.01	<0.01	<0.01	0	<0.01			<0.01	<0.01	0	<0.01		
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0	<0.01	<0.01	0	<0.01	<0.02	0
Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.1	0	<0.05	<0.05	0	<0.05	<0.1	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0	<0.01	<0.01	0	<0.01	0.03	100
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0	<0.01	<0.01	0	<0.01	0.03	100
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0	<0.01	<0.01	0	<0.01	<0.02	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0	<0.01	<0.01	0	<0.01	<0.02	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0	<0.01	<0.01	0	<0.01	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0	<0.01	<0.01	0	<0.01	<0.02	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0	<0.01	<0.01	0	<0.01	<0.02	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0	<0.01	<0.01	0	<0.01	<0.02	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.05	0	<0.01	<0.01	0	<0.01	<0.05	0
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.05	<0.05	0	<0.05	<0.02	0	<0.05	<0.05	0	<0.05	<0.02	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
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 sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane 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-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.05	<0.05	0	<0.05	<0.02	0	<0.05	<0.05	0	<0.05	<0.02	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.05	<0.05	0	<0.05	<0.02	0	<0.05	<0.05	0	<0.05	<0.02	0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.05	0	<0.01	<0.01	0	<0.01	<0.05	0
6:2 Fluorotelomer Sulfonate (6:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	0.29	141
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.05	0	<0.01	<0.01	0	<0.01	0.18	179
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.05	0	<0.01	<0.01	0	<0.01	<0.05	0
PFAS (Sum of Total)	µg/L	0.01	<0.1	<0.1	0	<0.1	0.02	0	<0.1	<0.1	0	<0.1	0.58	141
Sum of PFHxS and PFOS	µg/L	0.01	0.02	0.03	40	0.02	0.02	0	<0.01	<0.01	0	<0.01	0.05	133
PFAS (Sum of Total)(WA DER List)	µg/L	0.01	<0.05	<0.05	0	<0.05	0.02	0	<0.05	<0.05	0	<0.05	0.58	168
Sum of US EPA PFAS (PFOS + PFOA)*	µg/L	0.01	0.02	0.03	40	0.02			<0.01	<0.01	0	<0.01		
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	µg/L	0.01	0.02	0.03	40	0.02			<0.01	<0.01	0	<0.01		

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

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

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



Appendix B
Table 11 - QA/QC - RPD calculations for sediments

	Unit	EQL	Field ID		SS16		SSBD01		SS16		SSSD01		SS04		SSBD02		SS04		SSSD02	
			Date	16/07/2019	SSBD01		SS16	SSSD01		SS04	SSBD02		SS04	SSSD02		SS04	SSSD02		SS04	SSSD02
			Lab Report Number	666984	666984		666984	ES1923114		666984	666984		666984	ES1923114		666984	ES1923114		666984	ES1923114
			Matrix Type	soil	soil	RPD	soil	soil	RPD	soil	soil	RPD	soil	soil	RPD	soil	soil	RPD	soil	soil
Inorganics																				
Moisture (%)	%	0.1									31.8									32.9
Moisture Content (%)	%	1	32	30	6	32							31	30	3				31	
TOC																				
Total Organic Carbon	%	0.1	2.2			2.2							1.4						1.4	
PFAS																				
Perfluoropropanesulfonic acid (PFPrS)	µg/kg	5	<5	<5	0	<5							<5	<5	0			<5		
Perfluorobutane sulfonic acid (PFBS)	µg/kg	0.2	<5	<5	0	<5	<0.2	0					<5	<5	0			<5	<0.2	0
Perfluoropentane sulfonic acid (PFPeS)	µg/kg	0.2	<5	<5	0	<5	<0.2	0					<5	<5	0			<5	<0.2	0
Perfluorohexane sulfonic acid (PFHxS)	µg/kg	0.2	<5	<5	0	<5	<0.2	0					<5	<5	0			<5	<0.2	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/kg	0.2	<5	<5	0	<5	<0.2	0					<5	<5	0			<5	<0.2	0
Perfluorooctane sulfonic acid (PFOS)	µg/kg	0.2	<5	<5	0	<5	0.3	0					12	14	15			12	1.9	145
Perfluorononane sulfonate (PFNS)	µg/kg	5	<5	<5	0	<5							<5	<5	0			<5		
Perfluorodecanesulfonic acid (PFDS)	µg/kg	0.2	<5	<5	0	<5	<0.2	0					<5	<5	0			<5	<0.2	0
Perfluorobutanoic acid (PFBA)	µg/kg	1	<5	<5	0	<5	<1	0					<5	<5	0			<5	<1	0
Perfluoropentanoic acid (PFPeA)	µg/kg	0.2	<5	<5	0	<5	<0.2	0					<5	<5	0			<5	<0.2	0
Perfluorohexanoic acid (PFHxA)	µg/kg	0.2	<5	<5	0	<5	<0.2	0					<5	<5	0			<5	<0.2	0
Perfluoroheptanoic acid (PFHpA)	µg/kg	0.2	<5	<5	0	<5	<0.2	0					<5	<5	0			<5	<0.2	0
Perfluorooctanoic acid (PFOA)	µg/kg	0.2	<5	<5	0	<5	<0.2	0					<5	<5	0			<5	<0.2	0
Perfluorononanoic acid (PFNA)	µg/kg	0.2	<5	<5	0	<5	<0.2	0					<5	<5	0			<5	<0.2	0
Perfluorodecanoic acid (PFDA)	µg/kg	0.2	<5	<5	0	<5	<0.2	0					<5	<5	0			<5	<0.2	0
Perfluoroundecanoic acid (PFUnDA)	µg/kg	0.2	<5	<5	0	<5	<0.2	0					<5	<5	0			<5	<0.2	0
Perfluorododecanoic acid (PFDoDA)	µg/kg	0.2	<5	<5	0	<5	<0.2	0					<5	<5	0			<5	<0.2	0
Perfluorotridecanoic acid (PFTrDA)	µg/kg	0.2	<5	<5	0	<5	<0.2	0					<5	<5	0			<5	<0.2	0
Perfluorotetradecanoic acid (PFTeDA)	µg/kg	0.5	<5	<5	0	<5	<0.5	0					<5	<5	0			<5	<0.5	0
Perfluorooctane sulfonamide (FOSA)	µg/kg	0.2	<5	<5	0	<5	<0.2	0					<5	<5	0			<5	<0.2	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/kg	0.5	<5	<5	0	<5	<0.5	0					<5	<5	0			<5	<0.5	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/kg	0.5	<5	<5	0	<5	<0.5	0					<5	<5	0			<5	<0.5	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/kg	0.5	<5	<5	0	<5	<0.5	0					<5	<5	0			<5	<0.5	0
N-Methyl perfluorooctane sulfonamidoethanol (MEFOSE)	µg/kg	0.5	<5	<5	0	<5	<0.5	0					<5	<5	0			<5	<0.5	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/kg	0.2	<10	<10	0	<10	<0.2	0					<10	<10	0			<10	<0.2	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/kg	0.2	<10	<10	0	<10	<0.2	0					<10	<10	0			<10	<0.2	0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/kg	0.5	<5	<5	0	<5	<0.5	0					<5	<5	0			<5	<0.5	0
6:2 Fluorotelomer Sulfonate (6:2 FTS)	µg/kg	0.5	<10	<10	0	<10	<0.5	0					<10	<10	0			<10	<0.5	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/kg	0.5	<5	<5	0	<5	<0.5	0					<5	<5	0			<5	<0.5	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/kg	0.5	<5	<5	0	<5	<0.5	0					<5	<5	0			<5	<0.5	0
PFAS (Sum of Total)	µg/kg	0.2	<50	<50	0	<50	0.3	0					<50	<50	0			<50	1.9	0
Sum of PFHxS and PFOS	µg/kg	0.2	<5	<5	0	<5	0.3	0					12	14	15			12	1.9	145
PFAS (Sum of Total)(WA DER List)	µg/kg	0.2	<10	<10	0	<10	0.3	0					12	14	15			12	1.9	145
Sum of US EPA PFAS (PFOS + PFOA)*	µg/kg	5	<5	<5	0	<5							12	14	15			12		
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	µg/kg	5	<5	<5	0	<5							12	14	15			12		

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

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

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



		Field ID	10492_RNSD2	FTBD01		10492_RNSD2	FTSD01	
		Date	18/07/2019	18/07/2019		18/07/2019	23/07/2019	
		Lab Report Number	666984	666984		666984	ES1923114	
		Matrix Type	water	water	RPD	water	water	RPD
	Unit	EQL						
Inorganics								
Electrical conductivity (lab)	µS/cm	1						
Total Dissolved Solids	mg/L	10						
PFAS								
Perfluoropropanesulfonic acid (PFPrS)	µg/L	0.01	<0.01	<0.01	0	<0.01		
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	0.01	<0.01	0	0.01	<0.02	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	0.30	0.03	164	0.30	<0.01	187
Perfluorononane sulfonate (PFNS)	µg/L	0.01	<0.01	<0.01	0	<0.01		
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0
Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.1	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0
Perfluorotridecanoic acid (PFTriDA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.05	0
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.05	<0.05	0	<0.05	<0.02	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoethanol (MEFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.05	<0.05	0	<0.05	<0.02	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.05	<0.05	0	<0.05	<0.02	0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.05	0
6:2 Fluorotelomer Sulfonate (6:2 FTS)	µg/L	0.05	<0.05	0.07	33	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	0.02	0.03	40	0.02	<0.05	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.05	0
PFAS (Sum of Total)	µg/L	0.01	0.33	0.13	87	0.33	<0.01	188
Sum of PFHxS and PFOS	µg/L	0.01	0.31	0.03	165	0.31	<0.01	188
PFAS (Sum of Total)(WA DER List)	µg/L	0.01	0.33	0.13	87	0.33	<0.01	188
Sum of US EPA PFAS (PFOS + PFOA)*	µg/L	0.01	0.3	0.03	164	0.3		
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	µg/L	0.01	0.31	0.03	165	0.31		

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

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

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

Appendix C – Calibration certificates

Oil / Water Interface Meter

Instrument Solinst Interface Meter (30M)
Serial No. 312532



airmet

Air-Met Scientific Pty Ltd
 1300 137 067

Item	Test	Pass	Comments
Battery	Compartment	✓	
	Capacity above 7.9v	✓	
Probe	Cleaned/Decon.	✓	
	Operation	✓	
Connectors	Condition	✓	
		✓	
Tape Check	Cleaned	✓	
Connectors	Checked for cuts	✓	
Instrument Test	At surface level	✓	

Certificate of Calibration

This is to certify that the above instrument has been cleaned and tested.

Calibrated by: _____ **Lucy Shiels**

Calibration date: 10-Jul-19

Next calibration due: 06-Jan-20

Multi Parameter Water Meter



airmet

Air-Met Scientific Pty Ltd
1300 137 067

Instrument YSI Quatro Pro Plus
Serial No. 18J104312

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH	✓	
	2. mV	✓	
	3. EC	✓	
	4. D.O	✓	
	5. Temp	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. D.O		0 ppm		1806267729	0 ppm
2. Conductivity		2760uS		326685	2760uS
3. pH7		pH 7.00		330737	pH 7.00
4. pH4		pH 4.00		330734	pH 4.00
5. ORP mV		237.52		312984/ 313238	237.52
6. Temp °C		18.4		163377	18.4

Calibrated by: _____ Lucy Shiels

Calibration date: 10-Jul-19

Next calibration due: 6-Jan-20

Appendix D – Photographic log



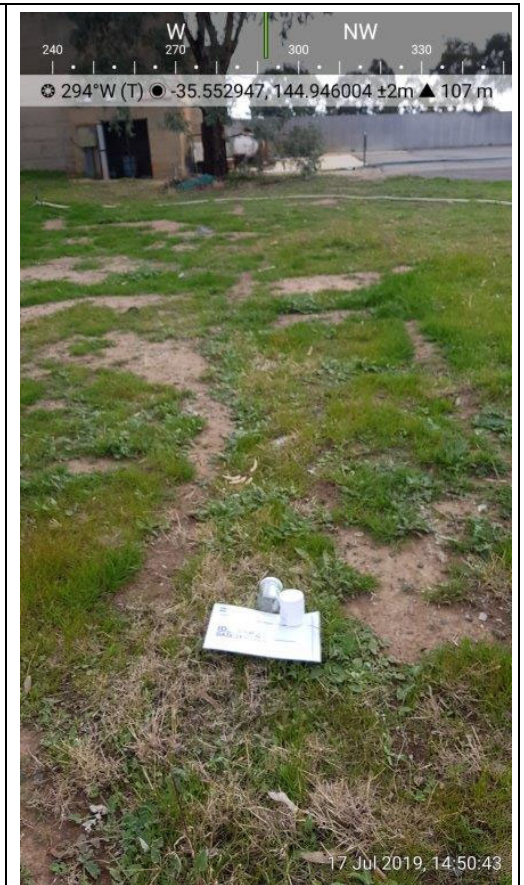
Photograph 1 Location SS16 / SW10



Photograph 2 Location SW09 within concrete lined drainage channel



Photograph 3 SS08 observed to be dry



Photograph 4 SS02 located onsite - also observed to be dry



Photograph 5 Nearside sampling locations from the firetruck



Photograph 6 Location not previously sampled - GW503702



Photograph 7 Location not previously sampled - SW12 / SS18 located beneath wooden slats; observed to be dry



Photograph 8 Volume and appearance of liquid collected as 10492_RNCBFO collected from the foam outlet

Appendix E – Laboratory reports

CHAIN OF CUSTODY RECORD

CLIENT DETAILS Page 1 of 4

Company Name : GHD Pty Ltd	Contact Name : Emmylou Cooke	Purchase Order : 40142005 2128370	COC Number :
Office Address : Level 15, 133 Castlereagh Street, Sydney NSW 2000	Project Manager : Emmylou cooke	PROJECT Number : 40142005 2128370	Eurofins mgt quote ID :
	Email for results : emmylou.cooke@ghd.com;	PROJECT Name : Groundwater Monitoring Deniliquin ADDITIONAL MONITORING DENILQUIN AND WAGGA WAGGA	Data output format:

Special Directions & Comments : Some common holding times (with correct preservation). For further information contact the lab

Sample ID	Date	Matrix	Analytes										Waters		Soils		Sample comments:			
			TRH/BTEX/Lead	TRH/BTEX	BTEXN	PFAS 20 SUITE (STD LAB)	TDS	PFAS ASLP												
1	MW01					X	X													
2	MW02					X	X													
3	MW03					X	X													
4	MW04					X	X													
5	MW05					X	X													
6	MW06					X	X													
7	GW03702					X	X													
8	GW03704					X	X													
9	SW01					X														
10	SW02					X														
11	SW03					X														
12	SW04					X														
13	SW05					X														
14	SW06					X														
15	SW07					X														
16	SW08					X														

Containers:								Sample comments:
1LP	250P	125P	1LA	40mL vial	125mL A	Jar		

Relinquished By: E. COOKE	Received By: <i>Grace Tucker</i>	Turn around time	Method Of Shipment	Temperature on arrival: 8.37
Date & Time: 19/7/19	Date & Time: 22:17 9am	1 DAY <input type="checkbox"/> 2 DAY <input type="checkbox"/> 3 DAY <input type="checkbox"/>	<input checked="" type="checkbox"/> Courier <input type="checkbox"/> Hand Delivered <input type="checkbox"/> Postal	Report number: 666984
Signature: <i>[Signature]</i>	Signature: <i>[Signature]</i>	5 DAY <input checked="" type="checkbox"/> 10 DAY <input type="checkbox"/> Other:	Courier Consignment # :	

CHAIN OF CUSTODY RECORD

CLIENT DETAILS		Page <u>2</u> of <u>4</u>	
Company Name : GHD Pty Ltd	Contact Name : Emmylou Cooke	Purchase Order : 404512006	COC Number :
Office Address :	Project Manager : Emmylou cooke	PROJECT Number : 404512005	Eurofins mgt quote ID :
Level 15, 133 Castlereagh Street, Sydney NSW 2000	Email for results : emmylou.cooke@ghd.com;	PROJECT Name : Sydney Heights UPSC and Validation	Data output format:

Special Directions & Comments :	Analytes										Some common holding times (with correct preservation). For further information contact the lab			
											Waters		Soils	
											BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
											TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
											Heavy Metals	6 months	Heavy Metals	6 months
											Mercury, CrVI	28 days	Mercury, CrVI	28 days
											Microbiological testing	24 hours	Microbiological testing	72 hours
											BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
											Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
											Ferrous iron	7 days	ASLP, TCLP	7 days

Sample ID	Date	Matrix	TRH/BTEX/Lead	TRH/BTEX	BTEXN	PFAS 28 (STD LEVEL)	ASLP PFAS	TOC	Containers:							Sample comments:	
									1LP	250P	125P	1LA	40mL vial	125mL A	Jar		
1 SW19						X											
2 SW18						X											
3 SW11						X											
4 SS01						X	X	X									
5 SS02						X	X	X									
6 SS03						X	X	X									
7 SS04						X	X	X									
8 SS05						X	X	X									
9 SS06						X	X	X									
10 SS07						X	X	X									
11 SS08						X	X	X									
12 SS09						X	X	X									
13 SS10						X	X	X									
14 SS11						X	X	X									
15 SS12						X	X	X									
16 SS13						X	X	X									

Relinquished By:	Laboratory Staff	Turn around time	Method Of Shipment	Temperature on arrival:
	Received By: <i>Grace Turnbull</i>	1 DAY <input type="checkbox"/> 2 DAY <input type="checkbox"/> 3 DAY <input type="checkbox"/>	<input checked="" type="checkbox"/> Courier <input type="checkbox"/> Hand Delivered <input type="checkbox"/> Postal	<i>8.37</i>
Date & Time :	Date & Time : <i>22/7 9am</i>	5 DAY <input type="checkbox"/> 10 DAY <input type="checkbox"/> Other:	Courier Consignment # :	Report number:
Signature:	Signature: <i>Turnbull</i>			<i>666984</i>



mgt

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 Phone: +612 9900 8400
 Email: enviro.syd@mglabmark.com.au

Brisbane
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Melbourne
 2 Kingston Town Close, Oakleigh, VIC 3166
 Phone: +613 8564 5000 Fax: +613 8564 5090
 Email: enquiries.melb@mglabmark.com.au

CHAIN OF CUSTODY RECORD

Page 3 of 4

CLIENT DETAILS		Company Name : GHD Pty Ltd		Contact Name : Emmylou Cooke	Purchase Order : 14000000	COC Number :	
Office Address :		Level 15, 133 Castlereagh Street, Sydney NSW 2000		Project Manager : Emmylou cooke	PROJECT Number : 401942005	Eurofins mgt quote ID :	
Special Directions & Comments :				Email for results : emmylou.cooke@ghd.com;	PROJECT Name : Sylvania Heights UPSS and Validation	Data output format:	

Sample ID	Date	Matrix	Analytes																		
			TRH/BTEX/Lead	TRH/BTEX	BTEXN	PFAS 28 SUITE (STD LEVEL)	PFAS ASLP	TOC	FORWARD TO ALS												
1	SS14					X	X	X													
2	SS15					X	X	X													
3	SS16					X	X	X													
4	SS17					X	X	X													
5	SS18					X	X	X													
6	SS19					X	X	X													
7	SSBD01					X															
8	SSBD02					X															
9	SWBD01					X															
10	SWBD02					X															
11	GWBD01					X															
12	SSSD01					X															
13	SSSD02					X															
14	SWSD01					X															
15	SWSD02					X															
16	GWSD01					X															

Some common holding times (with correct preservation). For further information contact the lab			
Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Sample ID	Date	Matrix	Containers:								Sample comments:	
			1LP	250P	125P	1LA	40mL vial	125mL A	Jar			
1	SS14											
2	SS15											
3	SS16											
4	SS17											
5	SS18											
6	SS19											
7	SSBD01											
8	SSBD02											
9	SWBD01											
10	SWBD02											
11	GWBD01											
12	SSSD01											
13	SSSD02											
14	SWSD01											
15	SWSD02											
16	GWSD01											

Relinquished By:	Laboratory Staff	Turn around time	Method Of Shipment	Temperature on arrival:
Date & Time :	Received By: <i>Grace Tuckwell</i>	1 DAY <input type="checkbox"/> 2 DAY <input type="checkbox"/> 3 DAY <input type="checkbox"/>	<input checked="" type="checkbox"/> Courier	<i>8.37</i>
Signature:	Date & Time : <i>22/7 9am</i>	5 DAY <input type="checkbox"/> 10 DAY <input type="checkbox"/> Other:	<input type="checkbox"/> Hand Delivered	Report number:
	Signature: <i>Tuckwell</i>		<input type="checkbox"/> Postal	<i>666984</i>
			Courier Consignment # :	



mgt

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 Email: enquiries.melb@mgtlabmark.com.au

CHAIN OF CUSTODY RECORD

CLIENT DETAILS		Page 24 of 34	
Company Name : GHD Pty Ltd	Contact Name : Emmylou Cooke	Purchase Order : 401012905	COC Number :
Office Address :	Project Manager : Emmylou cooke	PROJECT Number : 401012905	Eurofins mgt quote ID :
Level 15, 133 Castlereagh Street, Sydney NSW 2000	Email for results : emmylou.cooke@ghd.com;	PROJECT Name : Sylvania Heights UPSS and Validation	Data output format:

Special Directions & Comments :	Analytes						Some common holding times (with correct preservation). For further information contact the lab					
	TRH/BTEX/Lead	TRH/BTEX	BTEXN	PFAS 28 SUITE (STD LEVEL)	FORWARD TO ALS		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	

Eurofins | mgt DI water batch number:

Sample ID	Date	Matrix	TRH/BTEX/Lead	TRH/BTEX	BTEXN	PFAS 28 SUITE (STD LEVEL)	FORWARD TO ALS	Containers:							Sample comments:
								1LP	250P	125P	1LA	40mL vial	125mL A	Jar	
1 RIN 01															
2 10492-RNSD1															
3 10492-RNSD1															
4 10492-RNSD2															
5 FTBD 01															
6 FTSD 01															
7 10492-RNCBFO															
8															
9															
10															
11															
12															
13															
14															
15															
16															

FROM FIRETRUCK FOAM OUTLET

Relinquished By:	Laboratory Staff	Turn around time	Method Of Shipment	Temperature on arrival:
Date & Time :	Received By: <i>Grace Tarkenton</i>	1 DAY <input type="checkbox"/> 2 DAY <input type="checkbox"/> 3 DAY <input type="checkbox"/>	<input checked="" type="checkbox"/> Courier	8.37
Signature:	Date & Time : <i>22 Feb 2013</i>	5 DAY <input type="checkbox"/> 10 DAY <input type="checkbox"/> Other:	<input type="checkbox"/> Hand Delivered	Report number:
	Signature: <i>[Signature]</i>		<input type="checkbox"/> Postal	666984
			Courier Consignment # :	

Melbourne

6 Monterey Road
Dandenong South Vic 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney

Unit F3, Building F
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

Perth

2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261 Site # 23736

ABN – 50 005 085 521

e.mail : EnviroSales@eurofins.com

web : www.eurofins.com.au

Sample Receipt Advice

Company name: **GHD Pty Ltd NSW**
Contact name: **Emmylou Cooke**
Project name: **ADDITIONAL MONITORING DENILQUIN AND WAGGA WAGGA**
Project ID: **2128370**
COC number: **Not provided**
Turn around time: **5 Day**
Date/Time received: **Jul 22, 2019 9:00 AM**
Eurofins reference: **666984**

Sample information

- A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- Sample Temperature of a random sample selected from the batch as recorded by Eurofins Sample Receipt : 8.4 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.

Notes N/A Custody Seals intact (if used).

Sample 10492_RNC8F0 received empty, analysis cancelled. Samples SSSD01, SSSD02 (1 tub each), SWSD01, SWSD02, GWSD01 and FTSD01 (1 bottle each) sent to ALS.

Contact notes

If you have any questions with respect to these samples please contact:

Alena Bounkeua on Phone : or by e.mail: AlenaBounkeua@eurofins.com

Results will be delivered electronically via e.mail to Emmylou Cooke - Emmylou.Cooke@ghd.com.

Company Name:	GHD Pty Ltd NSW	Order No.:	2128370	Received:	Jul 22, 2019 9:00 AM
Address:	Level 15, 133 Castlereagh Street Sydney NSW 2000	Report #:	666984	Due:	Jul 29, 2019
Project Name:	ADDITIONAL MONITORING DENILQUIN AND WAGGA WAGGA	Phone:	02 9239 7100	Priority:	5 Day
Project ID:	2128370	Fax:	02 9239 7199	Contact Name:	Emmylou Cooke

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Conductivity (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Organic Carbon	AUS Leaching Procedure	Moisture Set	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X		X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794									X	X	X	X
Perth Laboratory - NATA Site # 23736												
External Laboratory												
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID							
1	MW01	Not Provided		Water	S19-JI29232	X	X					X
2	MW02	Not Provided		Water	S19-JI29233	X	X					X
3	MW03	Not Provided		Water	S19-JI29234	X	X					X
4	MW04	Not Provided		Water	S19-JI29235	X	X					X
5	MW05	Not Provided		Water	S19-JI29236	X	X					X
6	MW06	Not Provided		Water	S19-JI29237	X	X					X
7	GW503702	Not Provided		Water	S19-JI29238	X	X					X
8	GW503704	Not Provided		Water	S19-JI29239	X	X					X
9	SW01	Not Provided		Water	S19-JI29240							X

Company Name:	GHD Pty Ltd NSW	Order No.:	2128370	Received:	Jul 22, 2019 9:00 AM
Address:	Level 15, 133 Castlereagh Street Sydney NSW 2000	Report #:	666984	Due:	Jul 29, 2019
Project Name:	ADDITIONAL MONITORING DENILQUIN AND WAGGA WAGGA	Phone:	02 9239 7100	Priority:	5 Day
Project ID:	2128370	Fax:	02 9239 7199	Contact Name:	Emmylou Cooke

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Conductivity (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Organic Carbon	AUS Leaching Procedure	Moisture Set	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X		X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794									X	X	X	X
Perth Laboratory - NATA Site # 23736												
10	SW02	Not Provided		Water	S19-JI29241							X
11	SW03	Not Provided		Water	S19-JI29242							X
12	SW04	Not Provided		Water	S19-JI29243							X
13	SW05	Not Provided		Water	S19-JI29244							X
14	SW06	Not Provided		Water	S19-JI29245							X
15	SW07	Not Provided		Water	S19-JI29246							X
16	SW08	Not Provided		Water	S19-JI29247							X
17	SW09	Not Provided		Water	S19-JI29248							X
18	SW10	Not Provided		Water	S19-JI29249							X
19	SW11	Not Provided		Water	S19-JI29250							X
20	SS01	Not Provided		Soil	S19-JI29251			X	X			X
21	SS02	Not Provided		Soil	S19-JI29252			X	X			X

Company Name:	GHD Pty Ltd NSW	Order No.:	2128370	Received:	Jul 22, 2019 9:00 AM
Address:	Level 15, 133 Castlereagh Street Sydney NSW 2000	Report #:	666984	Due:	Jul 29, 2019
Project Name:	ADDITIONAL MONITORING DENILQUIN AND WAGGA WAGGA	Phone:	02 9239 7100	Priority:	5 Day
Project ID:	2128370	Fax:	02 9239 7199	Contact Name:	Emmylou Cooke

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Conductivity (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Organic Carbon	AUS Leaching Procedure	Moisture Set	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X		X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794									X	X	X	X
Perth Laboratory - NATA Site # 23736												
22	SS03	Not Provided		Soil	S19-JI29253			X	X		X	
23	SS04	Not Provided		Soil	S19-JI29254			X	X		X	
24	SS05	Not Provided		Soil	S19-JI29255			X	X		X	
25	SS06	Not Provided		Soil	S19-JI29256			X	X		X	
26	SS07	Not Provided		Soil	S19-JI29257			X	X		X	
27	SS08	Not Provided		Soil	S19-JI29258			X	X		X	
28	SS09	Not Provided		Soil	S19-JI29259			X	X		X	
29	SS10	Not Provided		Soil	S19-JI29260			X	X		X	
30	SS11	Not Provided		Soil	S19-JI29261			X	X		X	
31	SS12	Not Provided		Soil	S19-JI29262			X	X		X	
32	SS13	Not Provided		Soil	S19-JI29263			X	X		X	
33	SS14	Not Provided		Soil	S19-JI29264			X	X		X	

Company Name:	GHD Pty Ltd NSW	Order No.:	2128370	Received:	Jul 22, 2019 9:00 AM
Address:	Level 15, 133 Castlereagh Street Sydney NSW 2000	Report #:	666984	Due:	Jul 29, 2019
Project Name:	ADDITIONAL MONITORING DENILQUIN AND WAGGA WAGGA	Phone:	02 9239 7100	Priority:	5 Day
Project ID:	2128370	Fax:	02 9239 7199	Contact Name:	Emmylou Cooke

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Conductivity (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Organic Carbon	AUS Leaching Procedure	Moisture Set	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X		X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794									X	X	X	X
Perth Laboratory - NATA Site # 23736												
34	SS15	Not Provided		Soil	S19-JI29265			X	X		X	
35	SS16	Not Provided		Soil	S19-JI29266			X	X		X	
36	SS17	Not Provided		Soil	S19-JI29267			X	X		X	
37	SS18	Not Provided		Soil	S19-JI29268			X	X		X	
38	SS19	Not Provided		Soil	S19-JI29269			X	X		X	
39	SSBD01	Not Provided		Soil	S19-JI29270					X	X	
40	SSBD02	Not Provided		Soil	S19-JI29271					X	X	
41	SWBD01	Not Provided		Water	S19-JI29272						X	
42	SWBD02	Not Provided		Water	S19-JI29273						X	
43	GWBD01	Not Provided		Water	S19-JI29274						X	
44	RIN01	Not Provided		Water	S19-JI29275						X	
45	10492_RNSD1	Not Provided		Water	S19-JI29276						X	

Company Name:	GHD Pty Ltd NSW	Order No.:	2128370	Received:	Jul 22, 2019 9:00 AM
Address:	Level 15, 133 Castlereagh Street Sydney NSW 2000	Report #:	666984	Due:	Jul 29, 2019
Project Name:	ADDITIONAL MONITORING DENILQUIN AND WAGGA WAGGA	Phone:	02 9239 7100	Priority:	5 Day
Project ID:	2128370	Fax:	02 9239 7199	Contact Name:	Emmylou Cooke

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Conductivity (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Organic Carbon	AUS Leaching Procedure	Moisture Set	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X		X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794									X	X	X	X
Perth Laboratory - NATA Site # 23736												
46	10492_RNSD2	Not Provided		Water	S19-JI29277							X
47	FTBD01	Not Provided		Water	S19-JI29278							X
48	10492_RNCB F0	Not Provided		Product	S19-JI29279							X
49	SS01	Not Provided		AUS Leachate - Reagent Water	S19-JI29280				X			X
50	SS02	Not Provided		AUS Leachate - Reagent Water	S19-JI29281				X			X
51	SS03	Not Provided		AUS Leachate - Reagent Water	S19-JI29282				X			X
52	SS04	Not Provided		AUS Leachate - Reagent	S19-JI29283				X			X

Company Name:	GHD Pty Ltd NSW	Order No.:	2128370	Received:	Jul 22, 2019 9:00 AM
Address:	Level 15, 133 Castlereagh Street Sydney NSW 2000	Report #:	666984	Due:	Jul 29, 2019
Project Name:	ADDITIONAL MONITORING DENILQUIN AND WAGGA WAGGA	Phone:	02 9239 7100	Priority:	5 Day
Project ID:	2128370	Fax:	02 9239 7199	Contact Name:	Emmylou Cooke

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail				Conductivity (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Organic Carbon	AUS Leaching Procedure	Moisture Set	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271				X	X	X		X	X	
Sydney Laboratory - NATA Site # 18217										
Brisbane Laboratory - NATA Site # 20794							X	X	X	X
Perth Laboratory - NATA Site # 23736										
			Water							
53	SS05	Not Provided	AUS Leachate - Reagent Water				X			X
54	SS06	Not Provided	AUS Leachate - Reagent Water				X			X
55	SS07	Not Provided	AUS Leachate - Reagent Water				X			X
56	SS08	Not Provided	AUS Leachate - Reagent Water				X			X
57	SS09	Not Provided	AUS Leachate - Reagent				X			X

Company Name:	GHD Pty Ltd NSW	Order No.:	2128370	Received:	Jul 22, 2019 9:00 AM
Address:	Level 15, 133 Castlereagh Street Sydney NSW 2000	Report #:	666984	Due:	Jul 29, 2019
Project Name:	ADDITIONAL MONITORING DENILQUIN AND WAGGA WAGGA	Phone:	02 9239 7100	Priority:	5 Day
Project ID:	2128370	Fax:	02 9239 7199	Contact Name:	Emmylou Cooke

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail				Conductivity (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Organic Carbon	AUS Leaching Procedure	Moisture Set	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271				X	X	X		X	X	
Sydney Laboratory - NATA Site # 18217										
Brisbane Laboratory - NATA Site # 20794							X	X	X	X
Perth Laboratory - NATA Site # 23736										
			Water							
58	SS10	Not Provided	AUS Leachate - Reagent Water				X			X
59	SS11	Not Provided	AUS Leachate - Reagent Water				X			X
60	SS12	Not Provided	AUS Leachate - Reagent Water				X			X
61	SS13	Not Provided	AUS Leachate - Reagent Water				X			X
62	SS14	Not Provided	AUS Leachate - Reagent				X			X

Company Name:	GHD Pty Ltd NSW	Order No.:	2128370	Received:	Jul 22, 2019 9:00 AM
Address:	Level 15, 133 Castlereagh Street Sydney NSW 2000	Report #:	666984	Due:	Jul 29, 2019
Project Name:	ADDITIONAL MONITORING DENILQUIN AND WAGGA WAGGA	Phone:	02 9239 7100	Priority:	5 Day
Project ID:	2128370	Fax:	02 9239 7199	Contact Name:	Emmylou Cooke

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail				Conductivity (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Organic Carbon	AUS Leaching Procedure	Moisture Set	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271				X	X	X		X	X	
Sydney Laboratory - NATA Site # 18217										
Brisbane Laboratory - NATA Site # 20794							X	X	X	X
Perth Laboratory - NATA Site # 23736										
			Water							
63	SS15	Not Provided	AUS Leachate - Reagent Water				X			X
64	SS16	Not Provided	AUS Leachate - Reagent Water				X			X
65	SS17	Not Provided	AUS Leachate - Reagent Water				X			X
66	SS18	Not Provided	AUS Leachate - Reagent Water				X			X
67	SS19	Not Provided	AUS Leachate - Reagent				X			X



Environment Testing

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 Phone : +61 7 3902 4600
 NATA # 1261 Site # 20794

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 NATA # 1261
 Site # 23736

Company Name:	GHD Pty Ltd NSW	Order No.:	2128370	Received:	Jul 22, 2019 9:00 AM
Address:	Level 15, 133 Castlereagh Street Sydney NSW 2000	Report #:	666984	Due:	Jul 29, 2019
Project Name:	ADDITIONAL MONITORING DENILQUIN AND WAGGA WAGGA	Phone:	02 9239 7100	Priority:	5 Day
Project ID:	2128370	Fax:	02 9239 7199	Contact Name:	Emmylou Cooke

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail	Conductivity (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Organic Carbon	AUS Leaching Procedure	Moisture Set	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271	X	X	X		X	X	
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794				X	X	X	X
Perth Laboratory - NATA Site # 23736							
Water							
Test Counts	8	8	19	19	21	21	67

GHD Pty Ltd NSW
Level 15, 133 Castlereagh Street
Sydney
NSW 2000



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Attention: **Emmylou Cooke**

Report **666984-L**
Project name **ADDITIONAL MONITORING DENILQUIN AND WAGGA WAGGA**
Project ID **2128370**
Received Date **Jul 22, 2019**

Client Sample ID			SS01 AUS Leachate - Reagent Water S19-JI29280 Not Provided	SS02 AUS Leachate - Reagent Water S19-JI29281 Not Provided	SS03 AUS Leachate - Reagent Water S19-JI29282 Not Provided	SS04 AUS Leachate - Reagent Water S19-JI29283 Not Provided
Sample Matrix						
Eurofins Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
AUS Leaching Procedure						
Leachate Fluid ^{C01}		comment	4.0	4.0	4.0	4.0
pH (initial)	0.1	pH Units	7.2	7.1	6.6	6.8
pH (Leachate fluid)	0.1	pH Units	7.0	7.0	7.0	7.0
pH (off)	0.1	pH Units	7.8	7.5	7.0	7.0
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA) ^{N11}	0.05	ug/L	1.3	0.30	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA) ^{N11}	0.01	ug/L	2.2	0.73	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA) ^{N11}	0.01	ug/L	^{N09} 5.5	^{N09} 1.3	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA) ^{N11}	0.01	ug/L	0.50	0.42	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA) ^{N11}	0.01	ug/L	^{N09} 1.3	^{N09} 1.0	< 0.01	< 0.01
Perfluorononanoic acid (PFNA) ^{N11}	0.01	ug/L	0.27	0.13	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA) ^{N11}	0.01	ug/L	0.51	0.64	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA) ^{N11}	0.01	ug/L	< 0.1	0.17	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA) ^{N11}	0.01	ug/L	< 0.1	< 0.1	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA) ^{N15}	0.01	ug/L	< 0.1	< 0.1	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA) ^{N11}	0.01	ug/L	< 0.1	< 0.1	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	77	101	22	28
13C5-PFPeA (surr.)	1	%	82	103	50	56
13C5-PFHxA (surr.)	1	%	87	114	41	51
13C4-PFHpA (surr.)	1	%	81	107	39	48
13C8-PFOA (surr.)	1	%	83	111	70	85
13C5-PFNA (surr.)	1	%	79	104	41	52
13C6-PFDA (surr.)	1	%	80	108	46	58
13C2-PFUnDA (surr.)	1	%	82	107	40	51
13C2-PFDoDA (surr.)	1	%	81	105	44	62
13C2-PFTeDA (surr.)	1	%	79	110	37	50
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA) ^{N11}	0.05	ug/L	^{N09} 1.0	^{N09} 0.56	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA) ^{N11}	0.05	ug/L	< 0.1	< 0.1	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA) ^{N11}	0.05	ug/L	< 0.1	< 0.1	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) ^{N11}	0.05	ug/L	< 0.1	< 0.1	< 0.05	< 0.05

Client Sample ID			SS01 AUS Leachate - Reagent Water S19-JI29280 Not Provided	SS02 AUS Leachate - Reagent Water S19-JI29281 Not Provided	SS03 AUS Leachate - Reagent Water S19-JI29282 Not Provided	SS04 AUS Leachate - Reagent Water S19-JI29283 Not Provided
Sample Matrix						
Eurofins Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE) ^{N11}	0.05	ug/L	< 0.1	< 0.1	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA) ^{N11}	0.05	ug/L	< 0.1	< 0.1	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) ^{N11}	0.05	ug/L	< 0.1	< 0.1	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	87	110	35	42
D3-N-MeFOSA (surr.)	1	%	84	110	32	42
D5-N-EtFOSA (surr.)	1	%	96	117	31	36
D7-N-MeFOSE (surr.)	1	%	80	97	28	29
D9-N-EtFOSE (surr.)	1	%	76	96	23	27
D5-N-EtFOSAA (surr.)	1	%	87	104	44	62
D3-N-MeFOSAA (surr.)	1	%	82	112	45	57
Perfluoroalkyl sulfonic acids (PFASs)						
Perfluorobutanesulfonic acid (PFBS) ^{N11}	0.01	ug/L	1.3	0.41	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS) ^{N15}	0.01	ug/L	^{N09} 4.4	^{N09} 2.6	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS) ^{N15}	0.01	ug/L	0.57	0.15	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS) ^{N15}	0.01	ug/L	^{N09} 1.1	0.33	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS) ^{N11}	0.01	ug/L	^{N09} 7.1	^{N09} 2.7	^{N09} 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS) ^{N15}	0.01	ug/L	0.24	0.11	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS) ^{N11}	0.01	ug/L	^{N09} 510	^{N09} 87	^{N09} 0.39	^{N09} 0.16
Perfluorodecanesulfonic acid (PFDS) ^{N15}	0.01	ug/L	< 0.1	< 0.5	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	89	121	54	70
18O2-PFHxS (surr.)	1	%	85	113	75	101
13C8-PFOS (surr.)	1	%	75	106	50	64
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA) ^{N11}	0.01	ug/L	< 0.1	< 0.1	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA) ^{N11}	0.05	ug/L	6.5	3.2	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA) ^{N11}	0.01	ug/L	22	3.6	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA) ^{N15}	0.01	ug/L	0.63	2.0	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	98	108	42	71
13C2-6:2 FTSA (surr.)	1	%	97	112	52	73
13C2-8:2 FTSA (surr.)	1	%	16	20	34	52
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	517.1	89.7	0.4	0.16
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	511.3	88	0.39	0.16
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	518.4	90.7	0.4	0.16
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	557.7	100.66	0.4	0.16
Sum of PFASs (n=30)*	0.1	ug/L	566.42	107.35	0.4	0.16

Client Sample ID			SS05 AUS Leachate - Reagent Water S19-JI29284 Not Provided	SS06 AUS Leachate - Reagent Water S19-JI29285 Not Provided	SS07 AUS Leachate - Reagent Water S19-JI29286 Not Provided	SS08 AUS Leachate - Reagent Water S19-JI29287 Not Provided
Sample Matrix						
Eurofins Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
AUS Leaching Procedure						
Leachate Fluid ^{C01}		comment	4.0	4.0	4.0	4.0
pH (initial)	0.1	pH Units	7.6	7.8	8.9	7.5
pH (Leachate fluid)	0.1	pH Units	7.0	7.0	7.0	7.0
pH (off)	0.1	pH Units	7.6	7.7	9.4	7.8
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA) ^{N11}	0.01	ug/L	0.02	< 0.01	< 0.01	< 0.01
Perfluorononanoic acid (PFNA) ^{N11}	0.01	ug/L	0.03	< 0.01	< 0.01	0.02
Perfluorodecanoic acid (PFDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTTrDA) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	36	32	31	18
13C5-PFPeA (surr.)	1	%	58	57	62	25
13C5-PFHxA (surr.)	1	%	58	56	55	24
13C4-PFHpA (surr.)	1	%	59	58	58	25
13C8-PFOA (surr.)	1	%	92	94	89	42
13C5-PFNA (surr.)	1	%	64	67	65	25
13C6-PFDA (surr.)	1	%	71	73	72	26
13C2-PFUnDA (surr.)	1	%	70	70	73	26
13C2-PFDoDA (surr.)	1	%	82	84	80	30
13C2-PFTeDA (surr.)	1	%	57	58	60	30
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	51	49	54	24
D3-N-MeFOSA (surr.)	1	%	44	41	53	22
D5-N-EtFOSA (surr.)	1	%	48	48	49	26
D7-N-MeFOSE (surr.)	1	%	31	34	34	20
D9-N-EtFOSE (surr.)	1	%	30	32	33	19
D5-N-EtFOSAA (surr.)	1	%	79	79	81	29
D3-N-MeFOSAA (surr.)	1	%	75	77	76	29

Client Sample ID			SS05 AUS Leachate - Reagent Water S19-JI29284 Not Provided	SS06 AUS Leachate - Reagent Water S19-JI29285 Not Provided	SS07 AUS Leachate - Reagent Water S19-JI29286 Not Provided	SS08 AUS Leachate - Reagent Water S19-JI29287 Not Provided
Sample Matrix						
Eurofins Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonic acids (PFASs)						
Perfluorobutanesulfonic acid (PFBS) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS) ^{N15}	0.01	ug/L	^{N09} 0.03	^{N09} 0.01	< 0.01	^{N09} 0.02
Perfluoropropanesulfonic acid (PFPrS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS) ^{N11}	0.01	ug/L	^{N09} 0.01	< 0.01	< 0.01	^{N09} 0.01
Perfluoroheptanesulfonic acid (PFHpS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS) ^{N11}	0.01	ug/L	^{N09} 1.0	^{N09} 0.76	^{N09} 0.03	^{N09} 1.9
Perfluorodecanesulfonic acid (PFDS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	93	87	85	30
18O2-PFHxS (surr.)	1	%	119	120	112	48
13C8-PFOS (surr.)	1	%	67	72	80	54
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	79	83	81	25
13C2-6:2 FTSA (surr.)	1	%	108	124	128	25
13C2-8:2 FTSA (surr.)	1	%	122	81	112	16
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	1.01	0.76	0.03	1.91
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	1.02	0.76	0.03	1.9
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	1.03	0.76	0.03	1.91
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	1.03	0.76	< 0.05	1.91
Sum of PFASs (n=30)*	0.1	ug/L	1.09	0.77	< 0.1	1.95

Client Sample ID			SS09 AUS Leachate - Reagent Water S19-JI29288 Not Provided	SS10 AUS Leachate - Reagent Water S19-JI29289 Not Provided	SS11 AUS Leachate - Reagent Water S19-JI29290 Not Provided	SS12 AUS Leachate - Reagent Water S19-JI29291 Not Provided
Sample Matrix						
Eurofins Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
AUS Leaching Procedure						
Leachate Fluid ^{C01}		comment	4.0	4.0	4.0	4.0
pH (initial)	0.1	pH Units	6.8	6.8	7.4	7.3
pH (Leachate fluid)	0.1	pH Units	7.0	7.0	7.0	7.0
pH (off)	0.1	pH Units	7.0	7.4	8.0	7.1
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01

Client Sample ID			SS09 AUS Leachate - Reagent Water S19-JI29288 Not Provided	SS10 AUS Leachate - Reagent Water S19-JI29289 Not Provided	SS11 AUS Leachate - Reagent Water S19-JI29290 Not Provided	SS12 AUS Leachate - Reagent Water S19-JI29291 Not Provided
Sample Matrix						
Eurofins Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorononanoic acid (PFNA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	26	23	27	20
13C5-PFPeA (surr.)	1	%	58	45	43	39
13C5-PFHxA (surr.)	1	%	46	37	48	37
13C4-PFHpA (surr.)	1	%	45	38	49	35
13C8-PFOA (surr.)	1	%	75	65	76	65
13C5-PFNA (surr.)	1	%	52	43	54	38
13C6-PFDA (surr.)	1	%	53	42	60	40
13C2-PFUnDA (surr.)	1	%	54	44	60	41
13C2-PFDoDA (surr.)	1	%	59	50	67	45
13C2-PFTeDA (surr.)	1	%	46	42	56	44
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	39	37	41	36
D3-N-MeFOSA (surr.)	1	%	39	31	35	34
D5-N-EtFOSA (surr.)	1	%	40	29	33	35
D7-N-MeFOSE (surr.)	1	%	29	23	25	23
D9-N-EtFOSE (surr.)	1	%	25	22	23	22
D5-N-EtFOSAA (surr.)	1	%	55	48	69	42
D3-N-MeFOSAA (surr.)	1	%	55	46	65	41
Perfluoroalkyl sulfonic acids (PFSA)						
Perfluorobutanesulfonic acid (PFBS) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoronanesulfonic acid (PFNS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS) ^{N11}	0.01	ug/L	^{N09} 0.22	^{N09} 0.08	^{N09} 0.04	^{N09} 0.09
Perfluorodecanesulfonic acid (PFDS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	76	51	73	52
18O2-PFHxS (surr.)	1	%	97	79	99	76
13C8-PFOS (surr.)	1	%	71	52	71	50

Client Sample ID			SS09 AUS Leachate - Reagent Water S19-JI29288 Not Provided	SS10 AUS Leachate - Reagent Water S19-JI29289 Not Provided	SS11 AUS Leachate - Reagent Water S19-JI29290 Not Provided	SS12 AUS Leachate - Reagent Water S19-JI29291 Not Provided
Sample Matrix						
Eurofins Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	51	43	62	37
13C2-6:2 FTSA (surr.)	1	%	94	60	103	66
13C2-8:2 FTSA (surr.)	1	%	63	39	99	31
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	0.22	0.08	0.04	0.09
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.22	0.08	0.04	0.09
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.22	0.08	0.04	0.09
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	0.22	0.08	< 0.05	0.09
Sum of PFASs (n=30)*	0.1	ug/L	0.22	< 0.1	< 0.1	< 0.1

Client Sample ID			SS13 AUS Leachate - Reagent Water S19-JI29292 Not Provided	SS14 AUS Leachate - Reagent Water S19-JI29293 Not Provided	SS15 AUS Leachate - Reagent Water S19-JI29294 Not Provided	SS16 AUS Leachate - Reagent Water S19-JI29295 Not Provided
Sample Matrix						
Eurofins Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
AUS Leaching Procedure						
Leachate Fluid ^{C01}		comment	4.0	4.0	4.0	4.0
pH (initial)	0.1	pH Units	7.8	6.7	7.3	7.3
pH (Leachate fluid)	0.1	pH Units	7.0	7.0	7.0	7.0
pH (off)	0.1	pH Units	7.4	6.8	7.1	7.8
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA) ^{N11}	0.01	ug/L	< 0.01	0.01	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanoic acid (PFNA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA) ^{N11}	0.01	ug/L	< 0.01	0.02	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTTrDA) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	23	31	23	34
13C5-PFPeA (surr.)	1	%	43	58	56	59
13C5-PFHxA (surr.)	1	%	41	58	42	58
13C4-PFHpA (surr.)	1	%	41	55	43	56
13C8-PFOA (surr.)	1	%	68	85	44	86
13C5-PFNA (surr.)	1	%	47	60	52	62

Client Sample ID			SS13 AUS Leachate - Reagent Water S19-JI29292 Not Provided	SS14 AUS Leachate - Reagent Water S19-JI29293 Not Provided	SS15 AUS Leachate - Reagent Water S19-JI29294 Not Provided	SS16 AUS Leachate - Reagent Water S19-JI29295 Not Provided
Sample Matrix						
Eurofins Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
13C6-PFDA (surr.)	1	%	53	61	61	70
13C2-PFUnDA (surr.)	1	%	48	61	59	71
13C2-PFDoDA (surr.)	1	%	59	62	60	75
13C2-PFTeDA (surr.)	1	%	48	51	52	44
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	41	49	45	52
D3-N-MeFOSA (surr.)	1	%	38	40	41	48
D5-N-EtFOSA (surr.)	1	%	40	41	43	41
D7-N-MeFOSE (surr.)	1	%	26	29	28	34
D9-N-EtFOSE (surr.)	1	%	26	30	25	30
D5-N-EtFOSAA (surr.)	1	%	60	56	37	74
D3-N-MeFOSAA (surr.)	1	%	53	54	30	72
Perfluoroalkyl sulfonic acids (PFSA)						
Perfluorobutanesulfonic acid (PFBS) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS) ^{N11}	0.01	ug/L	< 0.01	^{N09} 0.03	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS) ^{N11}	0.01	ug/L	^{N09} 0.05	^{N09} 0.50	^{N09} 1.3	^{N09} 0.02
Perfluorodecanesulfonic acid (PFDS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	62	98	61	86
18O2-PFHxS (surr.)	1	%	88	119	86	121
13C8-PFOS (surr.)	1	%	61	79	62	83
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA) ^{N11}	0.01	ug/L	< 0.01	0.02	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	49	83	48	74
13C2-6:2 FTSA (surr.)	1	%	79	126	50	126
13C2-8:2 FTSA (surr.)	1	%	83	64	29	105

Client Sample ID			SS13 AUS Leachate - Reagent Water	SS14 AUS Leachate - Reagent Water	SS15 AUS Leachate - Reagent Water	SS16 AUS Leachate - Reagent Water
Sample Matrix			S19-JI29292	S19-JI29293	S19-JI29294	S19-JI29295
Eurofins Sample No.			Not Provided	Not Provided	Not Provided	Not Provided
Date Sampled						
Test/Reference	LOR	Unit				
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	0.05	0.53	1.3	0.02
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.05	0.5	1.3	0.02
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.05	0.53	1.3	0.02
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	0.05	0.56	1.3	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	0.58	1.3	< 0.1

Client Sample ID			SS17 AUS Leachate - Reagent Water	SS18 AUS Leachate - Reagent Water	SS19 AUS Leachate - Reagent Water
Sample Matrix			S19-JI29296	S19-JI29297	S19-JI29298
Eurofins Sample No.			Not Provided	Not Provided	Not Provided
Date Sampled					
Test/Reference	LOR	Unit			
AUS Leaching Procedure					
Leachate Fluid ^{C01}		comment	4.0	4.0	4.0
pH (initial)	0.1	pH Units	8.5	8.0	7.4
pH (Leachate fluid)	0.1	pH Units	7.0	7.0	7.0
pH (off)	0.1	pH Units	8.4	7.8	7.2
Perfluoroalkyl carboxylic acids (PFCAs)					
Perfluorobutanoic acid (PFBA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorononanoic acid (PFNA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTTrDA) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTTeDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	42	25	28
13C5-PFPeA (surr.)	1	%	84	58	55
13C5-PFHxA (surr.)	1	%	101	63	71
13C4-PFHpA (surr.)	1	%	85	55	61
13C8-PFOA (surr.)	1	%	106	75	76
13C5-PFNA (surr.)	1	%	88	57	66
13C6-PFDA (surr.)	1	%	88	60	61
13C2-PFUnDA (surr.)	1	%	88	58	62
13C2-PFDoDA (surr.)	1	%	101	73	63
13C2-PFTTeDA (surr.)	1	%	50	59	57
Perfluoroalkyl sulfonamido substances					
Perfluorooctane sulfonamide (FOSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05

Client Sample ID			SS17 AUS Leachate - Reagent Water S19-JI29296 Not Provided	SS18 AUS Leachate - Reagent Water S19-JI29297 Not Provided	SS19 AUS Leachate - Reagent Water S19-JI29298 Not Provided
Sample Matrix					
Eurofins Sample No.					
Date Sampled					
Test/Reference	LOR	Unit			
Perfluoroalkyl sulfonamido substances					
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	77	45	44
D3-N-MeFOSA (surr.)	1	%	54	42	43
D5-N-EtFOSA (surr.)	1	%	56	53	46
D7-N-MeFOSE (surr.)	1	%	47	34	37
D9-N-EtFOSE (surr.)	1	%	32	26	27
D5-N-EtFOSAA (surr.)	1	%	101	65	55
D3-N-MeFOSAA (surr.)	1	%	88	65	60
Perfluoroalkyl sulfonic acids (PFASs)					
Perfluorobutanesulfonic acid (PFBS) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS) ^{N11}	0.01	ug/L	< 0.01	^{NO9} 0.06	^{NO9} 0.03
Perfluorodecanesulfonic acid (PFDS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	119	81	75
18O2-PFHxS (surr.)	1	%	156	108	107
13C8-PFOS (surr.)	1	%	92	62	64
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	87	46	52
13C2-6:2 FTSA (surr.)	1	%	109	80	67
13C2-8:2 FTSA (surr.)	1	%	INT	118	116
PFASs Summations					
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01	0.06	0.03
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01	0.06	0.03
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01	0.06	0.03
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	0.06	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	< 0.1	< 0.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported. A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

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
AUS Leaching Procedure - Method:	Brisbane	Jul 23, 2019	7 Days
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs) - Method:	Brisbane	Jul 23, 2019	14 Days
Perfluoroalkyl sulfonamido substances - Method:	Brisbane	Jul 23, 2019	14 Days
Perfluoroalkyl sulfonic acids (PFSA)s - Method:	Brisbane	Jul 23, 2019	14 Days
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)s - Method:	Brisbane	Jul 23, 2019	14 Days

Company Name: GHD Pty Ltd NSW	Order No.: 2128370	Received: Jul 22, 2019 9:00 AM
Address: Level 15, 133 Castlereagh Street Sydney NSW 2000	Report #: 666984	Due: Jul 29, 2019
	Phone: 02 9239 7100	Priority: 5 Day
	Fax: 02 9239 7199	Contact Name: Emmylou Cooke
Project Name: ADDITIONAL MONITORING DENILQUIN AND WAGGA WAGGA		
Project ID: 2128370		

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Conductivity (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Organic Carbon	AUS Leaching Procedure	Moisture Set	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X		X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794									X	X	X	X
Perth Laboratory - NATA Site # 23736												
External Laboratory												
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID							
1	MW01	Not Provided		Water	S19-JI29232	X	X					X
2	MW02	Not Provided		Water	S19-JI29233	X	X					X
3	MW03	Not Provided		Water	S19-JI29234	X	X					X
4	MW04	Not Provided		Water	S19-JI29235	X	X					X
5	MW05	Not Provided		Water	S19-JI29236	X	X					X
6	MW06	Not Provided		Water	S19-JI29237	X	X					X
7	GW503702	Not Provided		Water	S19-JI29238	X	X					X
8	GW503704	Not Provided		Water	S19-JI29239	X	X					X
9	SW01	Not Provided		Water	S19-JI29240							X

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Eurofins Analytical Services Manager : Alena Bounkeua

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Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X		X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794									X	X	X	X
Perth Laboratory - NATA Site # 23736												
10	SW02	Not Provided		Water	S19-JI29241							X
11	SW03	Not Provided		Water	S19-JI29242							X
12	SW04	Not Provided		Water	S19-JI29243							X
13	SW05	Not Provided		Water	S19-JI29244							X
14	SW06	Not Provided		Water	S19-JI29245							X
15	SW07	Not Provided		Water	S19-JI29246							X
16	SW08	Not Provided		Water	S19-JI29247							X
17	SW09	Not Provided		Water	S19-JI29248							X
18	SW10	Not Provided		Water	S19-JI29249							X
19	SW11	Not Provided		Water	S19-JI29250							X
20	SS01	Not Provided		Soil	S19-JI29251			X	X			X
21	SS02	Not Provided		Soil	S19-JI29252			X	X			X

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Sample Detail						Conductivity (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Organic Carbon	AUS Leaching Procedure	Moisture Set	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X		X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794									X	X	X	X
Perth Laboratory - NATA Site # 23736												
22	SS03	Not Provided		Soil	S19-JI29253			X	X		X	
23	SS04	Not Provided		Soil	S19-JI29254			X	X		X	
24	SS05	Not Provided		Soil	S19-JI29255			X	X		X	
25	SS06	Not Provided		Soil	S19-JI29256			X	X		X	
26	SS07	Not Provided		Soil	S19-JI29257			X	X		X	
27	SS08	Not Provided		Soil	S19-JI29258			X	X		X	
28	SS09	Not Provided		Soil	S19-JI29259			X	X		X	
29	SS10	Not Provided		Soil	S19-JI29260			X	X		X	
30	SS11	Not Provided		Soil	S19-JI29261			X	X		X	
31	SS12	Not Provided		Soil	S19-JI29262			X	X		X	
32	SS13	Not Provided		Soil	S19-JI29263			X	X		X	
33	SS14	Not Provided		Soil	S19-JI29264			X	X		X	

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Sample Detail						Conductivity (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Organic Carbon	AUS Leaching Procedure	Moisture Set	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X		X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794									X	X	X	X
Perth Laboratory - NATA Site # 23736												
34	SS15	Not Provided		Soil	S19-JI29265			X	X		X	
35	SS16	Not Provided		Soil	S19-JI29266			X	X		X	
36	SS17	Not Provided		Soil	S19-JI29267			X	X		X	
37	SS18	Not Provided		Soil	S19-JI29268			X	X		X	
38	SS19	Not Provided		Soil	S19-JI29269			X	X		X	
39	SSBD01	Not Provided		Soil	S19-JI29270					X	X	
40	SSBD02	Not Provided		Soil	S19-JI29271					X	X	
41	SWBD01	Not Provided		Water	S19-JI29272						X	
42	SWBD02	Not Provided		Water	S19-JI29273						X	
43	GWBD01	Not Provided		Water	S19-JI29274						X	
44	RIN01	Not Provided		Water	S19-JI29275						X	
45	10492_RNSD1	Not Provided		Water	S19-JI29276						X	

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Project ID:	2128370	Fax:	02 9239 7199	Contact Name:	Emmylou Cooke

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Conductivity (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Organic Carbon	AUS Leaching Procedure	Moisture Set	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X		X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794									X	X	X	X
Perth Laboratory - NATA Site # 23736												
46	10492_RNSD2	Not Provided		Water	S19-JI29277							X
47	FTBD01	Not Provided		Water	S19-JI29278							X
48	10492_RNCB F0	Not Provided		Product	S19-JI29279							X
49	SS01	Not Provided		AUS Leachate - Reagent Water	S19-JI29280				X			X
50	SS02	Not Provided		AUS Leachate - Reagent Water	S19-JI29281				X			X
51	SS03	Not Provided		AUS Leachate - Reagent Water	S19-JI29282				X			X
52	SS04	Not Provided		AUS Leachate - Reagent	S19-JI29283				X			X

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Sample Detail				Conductivity (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Organic Carbon	AUS Leaching Procedure	Moisture Set	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271				X	X	X		X	X	
Sydney Laboratory - NATA Site # 18217										
Brisbane Laboratory - NATA Site # 20794							X	X	X	X
Perth Laboratory - NATA Site # 23736										
			Water							
53	SS05	Not Provided	AUS Leachate - Reagent Water				X			X
54	SS06	Not Provided	AUS Leachate - Reagent Water				X			X
55	SS07	Not Provided	AUS Leachate - Reagent Water				X			X
56	SS08	Not Provided	AUS Leachate - Reagent Water				X			X
57	SS09	Not Provided	AUS Leachate - Reagent				X			X

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Sample Detail				Conductivity (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Organic Carbon	AUS Leaching Procedure	Moisture Set	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271				X	X	X		X	X	
Sydney Laboratory - NATA Site # 18217										
Brisbane Laboratory - NATA Site # 20794							X	X	X	X
Perth Laboratory - NATA Site # 23736										
			Water							
58	SS10	Not Provided	AUS Leachate - Reagent Water				X			X
59	SS11	Not Provided	AUS Leachate - Reagent Water				X			X
60	SS12	Not Provided	AUS Leachate - Reagent Water				X			X
61	SS13	Not Provided	AUS Leachate - Reagent Water				X			X
62	SS14	Not Provided	AUS Leachate - Reagent				X			X

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Sample Detail				Conductivity (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Organic Carbon	AUS Leaching Procedure	Moisture Set	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271				X	X	X		X	X	
Sydney Laboratory - NATA Site # 18217										
Brisbane Laboratory - NATA Site # 20794							X	X	X	X
Perth Laboratory - NATA Site # 23736										
			Water							
63	SS15	Not Provided	AUS Leachate - Reagent Water				X			X
64	SS16	Not Provided	AUS Leachate - Reagent Water				X			X
65	SS17	Not Provided	AUS Leachate - Reagent Water				X			X
66	SS18	Not Provided	AUS Leachate - Reagent Water				X			X
67	SS19	Not Provided	AUS Leachate - Reagent				X			X

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Sample Detail	Conductivity (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Organic Carbon	AUS Leaching Procedure	Moisture Set	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271	X	X	X		X	X	
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794				X	X	X	X
Perth Laboratory - NATA Site # 23736							
Water							
Test Counts	8	8	19	19	21	21	67

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.

****NOTE:** pH duplicates are reported as a range NOT as RPD

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

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

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%

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 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

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.
- Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
- Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
- Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
- 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.
- Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
- For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
- Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code		
Method Blank									
Perfluoroalkyl carboxylic acids (PFCAs)									
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass			
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass			
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass			
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass			
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass			
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass			
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass			
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass			
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass			
Perfluorotridecanoic acid (PFTTrDA)	ug/L	< 0.01			0.01	Pass			
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass			
Method Blank									
Perfluoroalkyl sulfonamido substances									
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass			
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass			
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass			
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	ug/L	< 0.05			0.05	Pass			
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	ug/L	< 0.05			0.05	Pass			
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass			
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass			
Method Blank									
Perfluoroalkyl sulfonic acids (PFSA's)									
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass			
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass			
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass			
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass			
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass			
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass			
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass			
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass			
Method Blank									
n:2 Fluorotelomer sulfonic acids (n:2 FTSA's)									
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass			
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	ug/L	< 0.05			0.05	Pass			
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass			
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass			
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	S19-JI29288	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	S19-JI29288	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	S19-JI29288	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	S19-JI29288	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	S19-JI29288	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	S19-JI29288	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	S19-JI29288	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	S19-JI29288	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorododecanoic acid (PFDoDA)	S19-JI29288	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	S19-JI29288	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	S19-JI29288	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	S19-JI29288	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	S19-JI29288	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	S19-JI29288	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	S19-JI29288	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	S19-JI29288	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	S19-JI29288	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	S19-JI29288	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSA)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	S19-JI29288	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	S19-JI29288	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	S19-JI29288	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	S19-JI29288	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	S19-JI29288	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	S19-JI29288	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	S19-JI29288	CP	ug/L	0.22	0.21	4.0	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	S19-JI29288	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)	S19-JI29288	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	S19-JI29288	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	S19-JI29288	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	S19-JI29288	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	S19-JI29290	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	S19-JI29290	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	S19-JI29290	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	S19-JI29290	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate								
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD		
Perfluorooctanoic acid (PFOA)	S19-JI29290	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorononanoic acid (PFNA)	S19-JI29290	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorodecanoic acid (PFDA)	S19-JI29290	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoroundecanoic acid (PFUnDA)	S19-JI29290	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorododecanoic acid (PFDoDA)	S19-JI29290	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorotridecanoic acid (PFTrDA)	S19-JI29290	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorotetradecanoic acid (PFTeDA)	S19-JI29290	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Duplicate								
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD		
Perfluorooctane sulfonamide (FOSA)	S19-JI29290	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	S19-JI29290	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	S19-JI29290	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	S19-JI29290	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	S19-JI29290	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	S19-JI29290	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	S19-JI29290	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
Duplicate								
Perfluoroalkyl sulfonic acids (PFSA)				Result 1	Result 2	RPD		
Perfluorobutanesulfonic acid (PFBS)	S19-JI29290	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorononanesulfonic acid (PFNS)	S19-JI29290	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoropropanesulfonic acid (PFPrS)	S19-JI29290	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoropentanesulfonic acid (PFPeS)	S19-JI29290	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorohexanesulfonic acid (PFHxS)	S19-JI29290	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoroheptanesulfonic acid (PFHpS)	S19-JI29290	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorooctanesulfonic acid (PFOS)	S19-JI29290	CP	ug/L	0.04	0.04	8.0	30%	Pass
Perfluorodecanesulfonic acid (PFDS)	S19-JI29290	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)	S19-JI29290	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	S19-JI29290	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	S19-JI29290	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	S19-JI29290	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass

Duplicate								
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD		
Perfluorobutanoic acid (PFBA)	S19-JI29293	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
Perfluoropentanoic acid (PFPeA)	S19-JI29293	CP	ug/L	0.01	< 0.01	21	30%	Pass
Perfluorohexanoic acid (PFHxA)	S19-JI29293	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoroheptanoic acid (PFHpA)	S19-JI29293	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorooctanoic acid (PFOA)	S19-JI29293	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorononanoic acid (PFNA)	S19-JI29293	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorodecanoic acid (PFDA)	S19-JI29293	CP	ug/L	0.02	0.02	1.0	30%	Pass
Perfluoroundecanoic acid (PFUnDA)	S19-JI29293	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorododecanoic acid (PFDoDA)	S19-JI29293	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorotridecanoic acid (PFTrDA)	S19-JI29293	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorotetradecanoic acid (PFTeDA)	S19-JI29293	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Duplicate								
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD		
Perfluorooctane sulfonamide (FOSA)	S19-JI29293	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	S19-JI29293	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	S19-JI29293	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	S19-JI29293	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	S19-JI29293	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	S19-JI29293	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	S19-JI29293	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
Duplicate								
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD		
Perfluorobutanesulfonic acid (PFBS)	S19-JI29293	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorononanesulfonic acid (PFNS)	S19-JI29293	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoropropanesulfonic acid (PFPrS)	S19-JI29293	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoropentanesulfonic acid (PFPeS)	S19-JI29293	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorohexanesulfonic acid (PFHxS)	S19-JI29293	CP	ug/L	0.03	0.03	1.0	30%	Pass
Perfluoroheptanesulfonic acid (PFHpS)	S19-JI29293	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorooctanesulfonic acid (PFOS)	S19-JI29293	CP	ug/L	0.50	0.51	<1	30%	Pass
Perfluorodecanesulfonic acid (PFDS)	S19-JI29293	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)	S19-JI29293	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	S19-JI29293	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	S19-JI29293	CP	ug/L	0.02	0.02	9.0	30%	Pass
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	S19-JI29293	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	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
C01	Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other
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

Alena Bounkeua	Analytical Services Manager
Bryan Wilson	Senior Analyst-PFAS (QLD)


Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

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GHD Pty Ltd NSW
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 Accreditation Number 1261
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 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention: **Emmylou Cooke**

Report **666984-S**
 Project name **ADDITIONAL MONITORING DENILQUIN AND WAGGA WAGGA**
 Project ID **2128370**
 Received Date **Jul 22, 2019**

Client Sample ID			SS01	SS02	SS03	SS04
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-JI29251	S19-JI29252	S19-JI29253	S19-JI29254
Date Sampled			Not Provided	Not Provided	Not Provided	Not Provided
Test/Reference	LOR	Unit				
Total Organic Carbon	0.1	%	0.8	0.8	8.2	1.4
% Moisture	1	%	16	13	50	31
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA) ^{N11}	5	ug/kg	24	8.9	< 5	< 5
Perfluoropentanoic acid (PFPeA) ^{N11}	5	ug/kg	^{N09} 39	^{N09} 15	< 5	< 5
Perfluorohexanoic acid (PFHxA) ^{N11}	5	ug/kg	^{N09} 110	^{N09} 26	< 5	< 5
Perfluoroheptanoic acid (PFHpA) ^{N11}	5	ug/kg	^{N09} 12	^{N09} 7.7	< 5	< 5
Perfluorooctanoic acid (PFOA) ^{N11}	5	ug/kg	^{N09} 36	^{N09} 24	< 5	< 5
Perfluorononanoic acid (PFNA) ^{N11}	5	ug/kg	^{N09} 6.2	< 5	< 5	< 5
Perfluorodecanoic acid (PFDA) ^{N11}	5	ug/kg	11	17	< 5	< 5
Perfluoroundecanoic acid (PFUnDA) ^{N11}	5	ug/kg	< 5	12	< 5	< 5
Perfluorododecanoic acid (PFDoDA) ^{N11}	5	ug/kg	< 5	11	< 5	< 5
Perfluorotridecanoic acid (PFTrDA) ^{N15}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
13C4-PFBA (surr.)	1	%	80	75	72	75
13C5-PFPeA (surr.)	1	%	94	98	97	68
13C5-PFHxA (surr.)	1	%	87	90	92	88
13C4-PFHpA (surr.)	1	%	92	92	89	83
13C8-PFOA (surr.)	1	%	86	84	91	88
13C5-PFNA (surr.)	1	%	119	108	100	117
13C6-PFDA (surr.)	1	%	144	130	120	120
13C2-PFUnDA (surr.)	1	%	122	96	84	119
13C2-PFDoDA (surr.)	1	%	127	92	75	109
13C2-PFTeDA (surr.)	1	%	135	78	72	103
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA) ^{N11}	5	ug/kg	58	59	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA) ^{N11}	10	ug/kg	< 10	< 10	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) ^{N11}	10	ug/kg	< 10	< 10	< 10	< 10

Client Sample ID			SS01 Soil S19-JI29251 Not Provided	SS02 Soil S19-JI29252 Not Provided	SS03 Soil S19-JI29253 Not Provided	SS04 Soil S19-JI29254 Not Provided
Sample Matrix						
Eurofins Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
13C8-FOSA (surr.)	1	%	98	74	68	88
D3-N-MeFOSA (surr.)	1	%	81	72	79	94
D5-N-EtFOSA (surr.)	1	%	103	78	96	81
D7-N-MeFOSE (surr.)	1	%	90	83	63	93
D9-N-EtFOSE (surr.)	1	%	58	51	55	63
D5-N-EtFOSAA (surr.)	1	%	146	103	81	126
D3-N-MeFOSAA (surr.)	1	%	146	89	61	144
Perfluoroalkyl sulfonic acids (PFASs)						
Perfluorobutanesulfonic acid (PFBS) ^{N11}	5	ug/kg	30	9.9	< 5	< 5
Perfluorononanesulfonic acid (PFNS) ^{N15}	5	ug/kg	^{N09} 150	^{N09} 76	< 5	< 5
Perfluoropropanesulfonic acid (PFPrS) ^{N15}	5	ug/kg	11	< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS) ^{N15}	5	ug/kg	25	6.8	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS) ^{N11}	5	ug/kg	^{N09} 170	^{N09} 52	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS) ^{N15}	5	ug/kg	^{N09} 9.6	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS) ^{N11}	5	ug/kg	^{N09} 5000	^{N09} 1600	^{N09} 37	^{N09} 12
Perfluorodecanesulfonic acid (PFDS) ^{N15}	5	ug/kg	^{N09} 40	^{N09} 120	< 5	< 5
13C3-PFBS (surr.)	1	%	115	121	121	99
18O2-PFHxS (surr.)	1	%	116	135	123	107
13C8-PFOS (surr.)	1	%	113	69	133	111
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA) ^{N11}	10	ug/kg	93	39	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA) ^{N11}	5	ug/kg	< 5	85	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA) ^{N15}	5	ug/kg	54	< 5	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	79	91	76	66
13C2-6:2 FTSA (surr.)	1	%	144	126	74	54
13C2-8:2 FTSA (surr.)	1	%	180	165	175	177
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	5170	1652	37	12
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	5036	1624	37	12
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	5206	1676	37	12
Sum of WA DWER PFAS (n=10)*	10	ug/kg	5514	1867.5	37	12
Sum of PFASs (n=30)*	50	ug/kg	5878.8	2169.3	< 50	< 50

Client Sample ID			SS05 Soil S19-JI29255 Not Provided	SS06 Soil S19-JI29256 Not Provided	SS07 Soil S19-JI29257 Not Provided	SS08 Soil S19-JI29258 Not Provided
Sample Matrix						
Eurofins Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Total Organic Carbon	0.1	%	1.0	1.3	0.3	1.2
% Moisture	1	%	36	40	44	30

Client Sample ID			SS05 Soil S19-JI29255 Not Provided	SS06 Soil S19-JI29256 Not Provided	SS07 Soil S19-JI29257 Not Provided	SS08 Soil S19-JI29258 Not Provided
Sample Matrix						
Eurofins Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanoic acid (PFPeA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanoic acid (PFHxA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanoic acid (PFHpA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanoic acid (PFOA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanoic acid (PFNA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanoic acid (PFDA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroundecanoic acid (PFUnDA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorododecanoic acid (PFDoDA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotridecanoic acid (PFTrDA) ^{N15}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
13C4-PFBA (surr.)	1	%	80	81	80	75
13C5-PFPeA (surr.)	1	%	106	102	91	82
13C5-PFHxA (surr.)	1	%	100	106	93	88
13C4-PFHpA (surr.)	1	%	90	87	88	81
13C8-PFOA (surr.)	1	%	94	95	91	83
13C5-PFNA (surr.)	1	%	127	111	112	105
13C6-PFDA (surr.)	1	%	136	131	125	128
13C2-PFUnDA (surr.)	1	%	117	129	139	122
13C2-PFDoDA (surr.)	1	%	110	127	120	101
13C2-PFTeDA (surr.)	1	%	113	110	113	114
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA) ^{N11}	10	ug/kg	< 10	< 10	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) ^{N11}	10	ug/kg	< 10	< 10	< 10	< 10
13C8-FOSA (surr.)	1	%	93	96	105	88
D3-N-MeFOSA (surr.)	1	%	92	94	111	80
D5-N-EtFOSA (surr.)	1	%	94	112	102	92
D7-N-MeFOSE (surr.)	1	%	101	93	97	88
D9-N-EtFOSE (surr.)	1	%	63	66	71	60
D5-N-EtFOSAA (surr.)	1	%	130	147	148	139
D3-N-MeFOSAA (surr.)	1	%	144	187	181	164
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanesulfonic acid (PFNS) ^{N15}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropropanesulfonic acid (PFPrS) ^{N15}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS) ^{N15}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS) ^{N15}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS) ^{N11}	5	ug/kg	^{N09} 52	^{N09} 44	< 5	^{N09} 55
Perfluorodecanesulfonic acid (PFDS) ^{N15}	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	112	116	108	101

Client Sample ID			SS05 Soil S19-JI29255 Not Provided	SS06 Soil S19-JI29256 Not Provided	SS07 Soil S19-JI29257 Not Provided	SS08 Soil S19-JI29258 Not Provided
Sample Matrix						
Eurofins Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonic acids (PFSA)						
18O2-PFHxS (surr.)	1	%	126	109	118	103
13C8-PFOS (surr.)	1	%	134	117	93	115
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA) ^{N11}	10	ug/kg	< 10	< 10	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA) ^{N15}	5	ug/kg	< 5	< 5	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	96	66	80	75
13C2-6:2 FTSA (surr.)	1	%	82	66	50	59
13C2-8:2 FTSA (surr.)	1	%	140	161	183	137
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	52	44	< 5	55
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	52	44	< 5	55
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	52	44	< 5	55
Sum of WA DWER PFAS (n=10)*	10	ug/kg	52	44	< 10	55
Sum of PFASs (n=30)*	50	ug/kg	52	< 50	< 50	55

Client Sample ID			SS09 Soil S19-JI29259 Not Provided	SS10 Soil S19-JI29260 Not Provided	SS11 Soil S19-JI29261 Not Provided	SS12 Soil S19-JI29262 Not Provided
Sample Matrix						
Eurofins Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Total Organic Carbon	0.1	%	4.2	1.0	0.6	1.9
% Moisture	1	%	43	32	37	31
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanoic acid (PFPeA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanoic acid (PFHxA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanoic acid (PFHpA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanoic acid (PFOA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanoic acid (PFNA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanoic acid (PFDA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroundecanoic acid (PFUnDA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorododecanoic acid (PFDoDA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotridecanoic acid (PFTTrDA) ^{N15}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotetradecanoic acid (PFTTeDA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
13C4-PFBA (surr.)	1	%	79	79	79	53
13C5-PFPeA (surr.)	1	%	106	97	86	78
13C5-PFHxA (surr.)	1	%	98	97	96	69
13C4-PFHpA (surr.)	1	%	94	90	84	66
13C8-PFOA (surr.)	1	%	101	89	92	75
13C5-PFNA (surr.)	1	%	127	113	115	91
13C6-PFDA (surr.)	1	%	137	127	137	94
13C2-PFUnDA (surr.)	1	%	128	129	135	101

Client Sample ID			SS09 Soil S19-JI29259 Not Provided	SS10 Soil S19-JI29260 Not Provided	SS11 Soil S19-JI29261 Not Provided	SS12 Soil S19-JI29262 Not Provided
Sample Matrix	LOR	Unit				
Eurofins Sample No.						
Date Sampled						
Test/Reference						
Perfluoroalkyl carboxylic acids (PFCAs)						
13C2-PFDoDA (surr.)	1	%	114	115	118	84
13C2-PFTEdA (surr.)	1	%	119	115	122	81
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA) ^{N11}	10	ug/kg	< 10	< 10	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) ^{N11}	10	ug/kg	< 10	< 10	< 10	< 10
13C8-FOSA (surr.)	1	%	95	96	103	74
D3-N-MeFOSA (surr.)	1	%	85	86	81	73
D5-N-EtFOSA (surr.)	1	%	116	122	93	61
D7-N-MeFOSE (surr.)	1	%	80	83	66	90
D9-N-EtFOSE (surr.)	1	%	75	70	71	56
D5-N-EtFOSAA (surr.)	1	%	154	152	152	107
D3-N-MeFOSAA (surr.)	1	%	154	157	191	119
Perfluoroalkyl sulfonic acids (PFSA)						
Perfluorobutanesulfonic acid (PFBS) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanesulfonic acid (PFNS) ^{N15}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropropanesulfonic acid (PFPrS) ^{N15}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS) ^{N15}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS) ^{N15}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS) ^{N11}	5	ug/kg	^{N09/25} < 5	6.6	< 5	< 5
Perfluorodecanesulfonic acid (PFDS) ^{N15}	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	128	115	107	83
18O2-PFHxS (surr.)	1	%	126	105	115	91
13C8-PFOS (surr.)	1	%	135	103	81	98
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA) ^{N11}	10	ug/kg	< 10	< 10	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA) ^{N15}	5	ug/kg	< 5	< 5	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	92	69	87	81
13C2-6:2 FTSA (surr.)	1	%	129	55	60	61
13C2-8:2 FTSA (surr.)	1	%	194	137	185	130
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	25	6.6	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	25	6.6	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	25	6.6	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	25	< 10	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	< 50

Client Sample ID			SS13	SS14	SS15	SS16
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-JI29263	S19-JI29264	S19-JI29265	S19-JI29266
Date Sampled			Not Provided	Not Provided	Not Provided	Not Provided
Test/Reference	LOR	Unit				
Total Organic Carbon	0.1	%	0.9	8.8	5.5	2.2
% Moisture	1	%	32	56	40	32
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA) ^{N11}	5	ug/kg	< 5	16	< 5	< 5
Perfluoropentanoic acid (PFPeA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanoic acid (PFHxA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanoic acid (PFHpA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanoic acid (PFOA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanoic acid (PFNA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanoic acid (PFDA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroundecanoic acid (PFUnDA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorododecanoic acid (PFDoDA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotridecanoic acid (PFTTrDA) ^{N15}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotetradecanoic acid (PFTTeDA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
13C4-PFBA (surr.)	1	%	68	59	62	72
13C5-PFPeA (surr.)	1	%	81	82	71	86
13C5-PFHxA (surr.)	1	%	83	83	80	92
13C4-PFHpA (surr.)	1	%	84	79	82	88
13C8-PFOA (surr.)	1	%	82	70	86	95
13C5-PFNA (surr.)	1	%	107	78	105	116
13C6-PFDA (surr.)	1	%	115	67	100	134
13C2-PFUnDA (surr.)	1	%	127	35	75	130
13C2-PFDoDA (surr.)	1	%	96	52	84	116
13C2-PFTTeDA (surr.)	1	%	98	54	103	129
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA) ^{N11}	10	ug/kg	< 10	< 10	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) ^{N11}	10	ug/kg	< 10	< 10	< 10	< 10
13C8-FOSA (surr.)	1	%	94	40	67	89
D3-N-MeFOSA (surr.)	1	%	95	47	64	78
D5-N-EtFOSA (surr.)	1	%	99	58	80	99
D7-N-MeFOSE (surr.)	1	%	77	33	55	71
D9-N-EtFOSE (surr.)	1	%	60	40	48	63
D5-N-EtFOSAA (surr.)	1	%	132	63	87	160
D3-N-MeFOSAA (surr.)	1	%	129	45	59	164
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanesulfonic acid (PFNS) ^{N15}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropropanesulfonic acid (PFPrS) ^{N15}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS) ^{N15}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS) ^{N15}	5	ug/kg	< 5	< 5	< 5	< 5

Client Sample ID			SS13 Soil	SS14 Soil	SS15 Soil	SS16 Soil
Sample Matrix			S19-JI29263	S19-JI29264	S19-JI29265	S19-JI29266
Eurofins Sample No.			Not Provided	Not Provided	Not Provided	Not Provided
Date Sampled						
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonic acids (PFASs)						
Perfluorooctanesulfonic acid (PFOS) ^{N11}	5	ug/kg	< 5	^{N09} 40	^{N09} 52	< 5
Perfluorodecanesulfonic acid (PFDS) ^{N15}	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	107	134	117	110
18O2-PFHxS (surr.)	1	%	119	131	125	116
13C8-PFOS (surr.)	1	%	111	137	146	129
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA) ^{N11}	10	ug/kg	< 10	< 10	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA) ^{N15}	5	ug/kg	< 5	< 5	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	89	128	110	83
13C2-6:2 FTSA (surr.)	1	%	83	111	81	70
13C2-8:2 FTSA (surr.)	1	%	131	134	INT	151
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	40	52	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	40	52	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	40	52	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	56	52	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	56	52	< 50

Client Sample ID			SS17 Soil	SS18 Soil	SS19 Soil	SSBD01 Soil
Sample Matrix			S19-JI29267	S19-JI29268	S19-JI29269	S19-JI29270
Eurofins Sample No.			Not Provided	Not Provided	Not Provided	Not Provided
Date Sampled						
Test/Reference	LOR	Unit				
Total Organic Carbon	0.1	%	0.3	2.4	3.9	-
% Moisture	1	%	35	34	15	30
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanoic acid (PFPeA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanoic acid (PFHxA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanoic acid (PFHpA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanoic acid (PFOA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanoic acid (PFNA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanoic acid (PFDA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroundecanoic acid (PFUnDA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorododecanoic acid (PFDoDA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotridecanoic acid (PFTrDA) ^{N15}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
13C4-PFBA (surr.)	1	%	70	67	69	70
13C5-PFPeA (surr.)	1	%	101	99	127	89
13C5-PFHxA (surr.)	1	%	90	90	102	92
13C4-PFHpA (surr.)	1	%	82	80	100	85
13C8-PFOA (surr.)	1	%	83	86	124	87

Client Sample ID			SS17 Soil S19-JI29267 Not Provided	SS18 Soil S19-JI29268 Not Provided	SS19 Soil S19-JI29269 Not Provided	SSBD01 Soil S19-JI29270 Not Provided
Sample Matrix	LOR	Unit				
Eurofins Sample No.						
Date Sampled						
Test/Reference						
Perfluoroalkyl carboxylic acids (PFCAs)						
13C5-PFNA (surr.)	1	%	113	103	150	119
13C6-PFDA (surr.)	1	%	125	122	150	143
13C2-PFUnDA (surr.)	1	%	120	113	146	126
13C2-PFDoDA (surr.)	1	%	101	101	135	107
13C2-PFTeDA (surr.)	1	%	116	108	139	121
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA) ^{N11}	10	ug/kg	< 10	< 10	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) ^{N11}	10	ug/kg	< 10	< 10	< 10	< 10
13C8-FOSA (surr.)	1	%	98	83	105	95
D3-N-MeFOSA (surr.)	1	%	89	76	81	90
D5-N-EtFOSA (surr.)	1	%	96	107	119	104
D7-N-MeFOSE (surr.)	1	%	78	61	71	86
D9-N-EtFOSE (surr.)	1	%	64	59	57	62
D5-N-EtFOSAA (surr.)	1	%	151	129	179	145
D3-N-MeFOSAA (surr.)	1	%	160	110	199	140
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanesulfonic acid (PFNS) ^{N15}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropropanesulfonic acid (PFPrS) ^{N15}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS) ^{N15}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS) ^{N15}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanesulfonic acid (PFDS) ^{N15}	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	102	120	137	118
18O2-PFHxS (surr.)	1	%	114	122	143	113
13C8-PFOS (surr.)	1	%	102	134	160	132
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA) ^{N11}	10	ug/kg	< 10	< 10	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA) ^{N11}	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA) ^{N15}	5	ug/kg	< 5	< 5	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	60	84	158	61
13C2-6:2 FTSA (surr.)	1	%	65	73	INT	52
13C2-8:2 FTSA (surr.)	1	%	153	140	INT	INT

Client Sample ID			SS17	SS18	SS19	SSBD01
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-JI29267	S19-JI29268	S19-JI29269	S19-JI29270
Date Sampled			Not Provided	Not Provided	Not Provided	Not Provided
Test/Reference	LOR	Unit				
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	< 50

Client Sample ID			SSBD02	G01 10492_RNC BF0
Sample Matrix			Soil	Product
Eurofins Sample No.			S19-JI29271	S19-JI29279
Date Sampled			Not Provided	Not Provided
Test/Reference	LOR	Unit		
% Moisture	1	%	30	-
Perfluoroalkyl carboxylic acids (PFCAs)				
Perfluorobutanoic acid (PFBA) ^{N11}	5	ug/kg	< 5	< 100
Perfluoropentanoic acid (PFPeA) ^{N11}	5	ug/kg	< 5	< 100
Perfluorohexanoic acid (PFHxA) ^{N11}	5	ug/kg	< 5	^{N09} 900
Perfluoroheptanoic acid (PFHpA) ^{N11}	5	ug/kg	< 5	130
Perfluorooctanoic acid (PFOA) ^{N11}	5	ug/kg	< 5	190
Perfluorononanoic acid (PFNA) ^{N11}	5	ug/kg	< 5	< 100
Perfluorodecanoic acid (PFDA) ^{N11}	5	ug/kg	< 5	< 100
Perfluoroundecanoic acid (PFUnDA) ^{N11}	5	ug/kg	< 5	< 100
Perfluorododecanoic acid (PFDoDA) ^{N11}	5	ug/kg	< 5	< 100
Perfluorotridecanoic acid (PFTeDA) ^{N15}	5	ug/kg	< 5	< 100
Perfluorotetradecanoic acid (PFTeDA) ^{N11}	5	ug/kg	< 5	< 100
13C4-PFBA (surr.)	1	%	66	123
13C5-PFPeA (surr.)	1	%	94	102
13C5-PFHxA (surr.)	1	%	89	132
13C4-PFHpA (surr.)	1	%	84	100
13C8-PFOA (surr.)	1	%	86	122
13C5-PFNA (surr.)	1	%	109	143
13C6-PFDA (surr.)	1	%	129	136
13C2-PFUnDA (surr.)	1	%	121	134
13C2-PFDoDA (surr.)	1	%	108	120
13C2-PFTeDA (surr.)	1	%	102	122
Perfluoroalkyl sulfonamido substances				
Perfluorooctane sulfonamide (FOSA) ^{N11}	5	ug/kg	< 5	< 100
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA) ^{N11}	5	ug/kg	< 5	< 100
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA) ^{N11}	5	ug/kg	< 5	< 100
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) ^{N11}	5	ug/kg	< 5	< 100
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE) ^{N11}	5	ug/kg	< 5	< 100
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA) ^{N11}	10	ug/kg	< 10	< 100
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) ^{N11}	10	ug/kg	< 10	< 100
13C8-FOSA (surr.)	1	%	99	119

Client Sample ID			SSBD02	G0110492_RNC
Sample Matrix			Soil	BF0
Eurofins Sample No.			S19-JI29271	S19-JI29279
Date Sampled			Not Provided	Not Provided
Test/Reference	LOR	Unit		
Perfluoroalkyl sulfonamido substances				
D3-N-MeFOSA (surr.)	1	%	84	97
D5-N-EtFOSA (surr.)	1	%	113	108
D7-N-MeFOSE (surr.)	1	%	88	147
D9-N-EtFOSE (surr.)	1	%	65	143
D5-N-EtFOSAA (surr.)	1	%	154	135
D3-N-MeFOSAA (surr.)	1	%	162	143
Perfluoroalkyl sulfonic acids (PFASs)				
Perfluorobutanesulfonic acid (PFBS) ^{N11}	5	ug/kg	< 5	250
Perfluorononanesulfonic acid (PFNS) ^{N15}	5	ug/kg	< 5	< 100
Perfluoropropanesulfonic acid (PFPrS) ^{N15}	5	ug/kg	< 5	170
Perfluoropentanesulfonic acid (PFPeS) ^{N15}	5	ug/kg	< 5	< 100
Perfluorohexanesulfonic acid (PFHxS) ^{N11}	5	ug/kg	< 5	^{N09} 330
Perfluoroheptanesulfonic acid (PFHpS) ^{N15}	5	ug/kg	< 5	< 100
Perfluorooctanesulfonic acid (PFOS) ^{N11}	5	ug/kg	^{N09} 14	^{N09} 1900
Perfluorodecanesulfonic acid (PFDS) ^{N15}	5	ug/kg	< 5	< 100
13C3-PFBS (surr.)	1	%	108	148
18O2-PFHxS (surr.)	1	%	115	134
13C8-PFOS (surr.)	1	%	116	156
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)				
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA) ^{N11}	5	ug/kg	< 5	< 100
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA) ^{N11}	10	ug/kg	< 10	16000
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA) ^{N11}	5	ug/kg	< 5	830
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA) ^{N15}	5	ug/kg	< 5	< 100
13C2-4:2 FTSA (surr.)	1	%	74	157
13C2-6:2 FTSA (surr.)	1	%	101	169
13C2-8:2 FTSA (surr.)	1	%	167	109
PFASs Summations				
Sum (PFHxS + PFOS)*	5	ug/kg	14	2230
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	14	2090
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	14	2420
Sum of WA DWER PFAS (n=10)*	10	ug/kg	14	20530
Sum of PFASs (n=30)*	50	ug/kg	< 50	20700

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported. A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

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
Total Organic Carbon - Method: LTM-INO-4060 Total Organic Carbon in water and soil	Melbourne	Jul 25, 2019	28 Days
% Moisture - Method: LTM-GEN-7080 Moisture	Brisbane	Jul 22, 2019	14 Days
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs) - Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)	Brisbane	Jul 23, 2019	180 Days
Perfluoroalkyl sulfonamido substances - Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)	Brisbane	Jul 23, 2019	180 Days
Perfluoroalkyl sulfonic acids (PFSAs) - Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)	Brisbane	Jul 23, 2019	180 Days
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs) - Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)	Brisbane	Jul 23, 2019	180 Days

Company Name: GHD Pty Ltd NSW	Order No.: 2128370	Received: Jul 22, 2019 9:00 AM
Address: Level 15, 133 Castlereagh Street Sydney NSW 2000	Report #: 666984	Due: Jul 29, 2019
	Phone: 02 9239 7100	Priority: 5 Day
	Fax: 02 9239 7199	Contact Name: Emmylou Cooke
Project Name: ADDITIONAL MONITORING DENILQUIN AND WAGGA WAGGA		
Project ID: 2128370		

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Conductivity (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Organic Carbon	AUS Leaching Procedure	Moisture Set	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X		X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794									X	X	X	X
Perth Laboratory - NATA Site # 23736												
External Laboratory												
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID							
1	MW01	Not Provided		Water	S19-JI29232	X	X					X
2	MW02	Not Provided		Water	S19-JI29233	X	X					X
3	MW03	Not Provided		Water	S19-JI29234	X	X					X
4	MW04	Not Provided		Water	S19-JI29235	X	X					X
5	MW05	Not Provided		Water	S19-JI29236	X	X					X
6	MW06	Not Provided		Water	S19-JI29237	X	X					X
7	GW503702	Not Provided		Water	S19-JI29238	X	X					X
8	GW503704	Not Provided		Water	S19-JI29239	X	X					X
9	SW01	Not Provided		Water	S19-JI29240							X

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Project ID:	2128370	Fax:	02 9239 7199	Contact Name:	Emmylou Cooke

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Conductivity (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Organic Carbon	AUS Leaching Procedure	Moisture Set	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X		X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794									X	X	X	X
Perth Laboratory - NATA Site # 23736												
10	SW02	Not Provided		Water	S19-JI29241							X
11	SW03	Not Provided		Water	S19-JI29242							X
12	SW04	Not Provided		Water	S19-JI29243							X
13	SW05	Not Provided		Water	S19-JI29244							X
14	SW06	Not Provided		Water	S19-JI29245							X
15	SW07	Not Provided		Water	S19-JI29246							X
16	SW08	Not Provided		Water	S19-JI29247							X
17	SW09	Not Provided		Water	S19-JI29248							X
18	SW10	Not Provided		Water	S19-JI29249							X
19	SW11	Not Provided		Water	S19-JI29250							X
20	SS01	Not Provided		Soil	S19-JI29251			X	X			X
21	SS02	Not Provided		Soil	S19-JI29252			X	X			X

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Project ID:	2128370	Fax:	02 9239 7199	Contact Name:	Emmylou Cooke

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Conductivity (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Organic Carbon	AUS Leaching Procedure	Moisture Set	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X		X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794									X	X	X	X
Perth Laboratory - NATA Site # 23736												
22	SS03	Not Provided		Soil	S19-JI29253			X	X	X	X	
23	SS04	Not Provided		Soil	S19-JI29254			X	X	X	X	
24	SS05	Not Provided		Soil	S19-JI29255			X	X	X	X	
25	SS06	Not Provided		Soil	S19-JI29256			X	X	X	X	
26	SS07	Not Provided		Soil	S19-JI29257			X	X	X	X	
27	SS08	Not Provided		Soil	S19-JI29258			X	X	X	X	
28	SS09	Not Provided		Soil	S19-JI29259			X	X	X	X	
29	SS10	Not Provided		Soil	S19-JI29260			X	X	X	X	
30	SS11	Not Provided		Soil	S19-JI29261			X	X	X	X	
31	SS12	Not Provided		Soil	S19-JI29262			X	X	X	X	
32	SS13	Not Provided		Soil	S19-JI29263			X	X	X	X	
33	SS14	Not Provided		Soil	S19-JI29264			X	X	X	X	

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Project ID:	2128370	Fax:	02 9239 7199	Contact Name:	Emmylou Cooke

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Conductivity (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Organic Carbon	AUS Leaching Procedure	Moisture Set	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X		X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794									X	X	X	X
Perth Laboratory - NATA Site # 23736												
34	SS15	Not Provided		Soil	S19-JI29265			X	X		X	
35	SS16	Not Provided		Soil	S19-JI29266			X	X		X	
36	SS17	Not Provided		Soil	S19-JI29267			X	X		X	
37	SS18	Not Provided		Soil	S19-JI29268			X	X		X	
38	SS19	Not Provided		Soil	S19-JI29269			X	X		X	
39	SSBD01	Not Provided		Soil	S19-JI29270					X	X	
40	SSBD02	Not Provided		Soil	S19-JI29271					X	X	
41	SWBD01	Not Provided		Water	S19-JI29272						X	
42	SWBD02	Not Provided		Water	S19-JI29273						X	
43	GWBD01	Not Provided		Water	S19-JI29274						X	
44	RIN01	Not Provided		Water	S19-JI29275						X	
45	10492_RNSD1	Not Provided		Water	S19-JI29276						X	

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Project Name:	ADDITIONAL MONITORING DENILQUIN AND WAGGA WAGGA	Phone:	02 9239 7100	Priority:	5 Day
Project ID:	2128370	Fax:	02 9239 7199	Contact Name:	Emmylou Cooke

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Conductivity (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Organic Carbon	AUS Leaching Procedure	Moisture Set	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X		X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794									X	X	X	X
Perth Laboratory - NATA Site # 23736												
46	10492_RNSD2	Not Provided		Water	S19-JI29277							X
47	FTBD01	Not Provided		Water	S19-JI29278							X
48	10492_RNCB F0	Not Provided		Product	S19-JI29279							X
49	SS01	Not Provided		AUS Leachate - Reagent Water	S19-JI29280				X			X
50	SS02	Not Provided		AUS Leachate - Reagent Water	S19-JI29281				X			X
51	SS03	Not Provided		AUS Leachate - Reagent Water	S19-JI29282				X			X
52	SS04	Not Provided		AUS Leachate - Reagent	S19-JI29283				X			X

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	Fax: 02 9239 7199	Contact Name: Emmylou Cooke
Project Name: ADDITIONAL MONITORING DENILQUIN AND WAGGA WAGGA		
Project ID: 2128370		

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail				Conductivity (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Organic Carbon	AUS Leaching Procedure	Moisture Set	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271				X	X	X		X	X	
Sydney Laboratory - NATA Site # 18217										
Brisbane Laboratory - NATA Site # 20794							X	X	X	X
Perth Laboratory - NATA Site # 23736										
			Water							
53	SS05	Not Provided	AUS Leachate - Reagent Water				X			X
54	SS06	Not Provided	AUS Leachate - Reagent Water				X			X
55	SS07	Not Provided	AUS Leachate - Reagent Water				X			X
56	SS08	Not Provided	AUS Leachate - Reagent Water				X			X
57	SS09	Not Provided	AUS Leachate - Reagent				X			X

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Project Name: ADDITIONAL MONITORING DENILQUIN AND WAGGA WAGGA		
Project ID: 2128370		

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail				Conductivity (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Organic Carbon	AUS Leaching Procedure	Moisture Set	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271				X	X	X		X	X	
Sydney Laboratory - NATA Site # 18217										
Brisbane Laboratory - NATA Site # 20794							X	X	X	X
Perth Laboratory - NATA Site # 23736										
			Water							
58	SS10	Not Provided	AUS Leachate - Reagent Water				X			X
59	SS11	Not Provided	AUS Leachate - Reagent Water				X			X
60	SS12	Not Provided	AUS Leachate - Reagent Water				X			X
61	SS13	Not Provided	AUS Leachate - Reagent Water				X			X
62	SS14	Not Provided	AUS Leachate - Reagent				X			X

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Project Name:	ADDITIONAL MONITORING DENILQUIN AND WAGGA WAGGA	Phone:	02 9239 7100	Priority:	5 Day
Project ID:	2128370	Fax:	02 9239 7199	Contact Name:	Emmylou Cooke

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail				Conductivity (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Organic Carbon	AUS Leaching Procedure	Moisture Set	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271				X	X	X		X	X	
Sydney Laboratory - NATA Site # 18217										
Brisbane Laboratory - NATA Site # 20794							X	X	X	X
Perth Laboratory - NATA Site # 23736										
			Water							
63	SS15	Not Provided	AUS Leachate - Reagent Water				X			X
64	SS16	Not Provided	AUS Leachate - Reagent Water				X			X
65	SS17	Not Provided	AUS Leachate - Reagent Water				X			X
66	SS18	Not Provided	AUS Leachate - Reagent Water				X			X
67	SS19	Not Provided	AUS Leachate - Reagent				X			X

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	Phone: 02 9239 7100	Priority: 5 Day
	Fax: 02 9239 7199	Contact Name: Emmylou Cooke
Project Name: ADDITIONAL MONITORING DENILQUIN AND WAGGA WAGGA		
Project ID: 2128370		

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail	Conductivity (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Organic Carbon	AUS Leaching Procedure	Moisture Set	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271	X	X	X		X	X	
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794				X	X	X	X
Perth Laboratory - NATA Site # 23736							
Water							
Test Counts	8	8	19	19	21	21	67

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.

****NOTE:** pH duplicates are reported as a range NOT as RPD

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

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

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%

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 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

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.
- Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
- Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
- Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
- 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.
- Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
- For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
- Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Method Blank						
Total Organic Carbon	%	< 0.1		0.1	Pass	
Method Blank						
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)	ug/kg	< 5		5	Pass	
Perfluoropentanoic acid (PFPeA)	ug/kg	< 5		5	Pass	
Perfluorohexanoic acid (PFHxA)	ug/kg	< 5		5	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/kg	< 5		5	Pass	
Perfluorooctanoic acid (PFOA)	ug/kg	< 5		5	Pass	
Perfluorononanoic acid (PFNA)	ug/kg	< 5		5	Pass	
Perfluorodecanoic acid (PFDA)	ug/kg	< 5		5	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/kg	< 5		5	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/kg	< 5		5	Pass	
Perfluorotridecanoic acid (PFTTrDA)	ug/kg	< 5		5	Pass	
Perfluorotetradecanoic acid (PFTTeDA)	ug/kg	< 5		5	Pass	
Method Blank						
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 5		5	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 5		5	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/kg	< 5		5	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	ug/kg	< 5		5	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	ug/kg	< 5		5	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/kg	< 10		10	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/kg	< 10		10	Pass	
Method Blank						
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)	ug/kg	< 5		5	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/kg	< 5		5	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/kg	< 5		5	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/kg	< 5		5	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 5		5	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/kg	< 5		5	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 5		5	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 5		5	Pass	
Method Blank						
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/kg	< 5		5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	ug/kg	< 10		10	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/kg	< 5		5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/kg	< 5		5	Pass	
LCS - % Recovery						
Total Organic Carbon	%	107		70-130	Pass	
LCS - % Recovery						
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)	%	88		50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	82		50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	92		50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	91		50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	93		50-150	Pass	
Perfluorononanoic acid (PFNA)	%	96		50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	102		50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code	
Perfluoroundecanoic acid (PFUnDA)	%	90			50-150	Pass		
Perfluorododecanoic acid (PFDoDA)	%	92			50-150	Pass		
Perfluorotridecanoic acid (PFTrDA)	%	81			50-150	Pass		
Perfluorotetradecanoic acid (PFTeDA)	%	93			50-150	Pass		
LCS - % Recovery								
Perfluoroalkyl sulfonamido substances								
Perfluorooctane sulfonamide (FOSA)	%	103			50-150	Pass		
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	79			50-150	Pass		
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	126			50-150	Pass		
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	%	89			50-150	Pass		
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	%	96			50-150	Pass		
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	92			50-150	Pass		
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	76			50-150	Pass		
LCS - % Recovery								
Perfluoroalkyl sulfonic acids (PFSAs)								
Perfluorobutanesulfonic acid (PFBS)	%	94			50-150	Pass		
Perfluorononanesulfonic acid (PFNS)	%	108			50-150	Pass		
Perfluoropropanesulfonic acid (PFPrS)	%	90			50-150	Pass		
Perfluoropentanesulfonic acid (PFPeS)	%	89			50-150	Pass		
Perfluorohexanesulfonic acid (PFHxS)	%	104			50-150	Pass		
Perfluoroheptanesulfonic acid (PFHpS)	%	107			50-150	Pass		
Perfluorooctanesulfonic acid (PFOS)	%	132			50-150	Pass		
Perfluorodecanesulfonic acid (PFDS)	%	81			50-150	Pass		
LCS - % Recovery								
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)								
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	99			50-150	Pass		
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	%	72			50-150	Pass		
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	54			50-150	Pass		
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	117			50-150	Pass		
Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery								
Perfluoroalkyl carboxylic acids (PFCAs)								
Perfluorobutanoic acid (PFBA)	B19-JI28492	NCP	%	88		50-150	Pass	
Perfluoropentanoic acid (PFPeA)	B19-JI28492	NCP	%	80		50-150	Pass	
Perfluorohexanoic acid (PFHxA)	B19-JI28492	NCP	%	99		50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	B19-JI28492	NCP	%	90		50-150	Pass	
Perfluorooctanoic acid (PFOA)	B19-JI28492	NCP	%	99		50-150	Pass	
Perfluorononanoic acid (PFNA)	B19-JI28492	NCP	%	90		50-150	Pass	
Perfluorodecanoic acid (PFDA)	B19-JI28492	NCP	%	101		50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	B19-JI28492	NCP	%	88		50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	B19-JI28492	NCP	%	97		50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	B19-JI28492	NCP	%	99		50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B19-JI28492	NCP	%	95		50-150	Pass	
Spike - % Recovery								
Perfluoroalkyl sulfonamido substances								
Perfluorooctane sulfonamide (FOSA)	B19-JI28492	NCP	%	95		50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B19-JI28492	NCP	%	101		50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B19-JI28492	NCP	%	107		50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	B19-JI28492	NCP	%	72			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	B19-JI28492	NCP	%	70			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B19-JI28492	NCP	%	75			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B19-JI28492	NCP	%	94			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFASs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	B19-JI28492	NCP	%	96			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	B19-JI28492	NCP	%	119			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B19-JI28492	NCP	%	90			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B19-JI28492	NCP	%	87			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B19-JI28492	NCP	%	109			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B19-JI28492	NCP	%	121			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M19-JI23708	NCP	%	92			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	B19-JI28492	NCP	%	82			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B19-JI28492	NCP	%	74			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	B19-JI28492	NCP	%	126			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B19-JI28492	NCP	%	90			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B19-JI28492	NCP	%	142			50-150	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Total Organic Carbon	S19-JI29255	CP	%	1.0	0.9	4.7	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Total Organic Carbon	S19-JI29262	CP	%	1.9	1.5	28	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S19-JI27695	NCP	%	23	25	8.0	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	S19-JI29279	CP	ug/kg	< 100	< 100	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	S19-JI29279	CP	ug/kg	< 100	< 100	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	S19-JI29279	CP	ug/kg	900	910	1.0	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	S19-JI29279	CP	ug/kg	130	130	5.0	30%	Pass	
Perfluorooctanoic acid (PFOA)	S19-JI29279	CP	ug/kg	190	200	3.0	30%	Pass	
Perfluorononanoic acid (PFNA)	S19-JI29279	CP	ug/kg	< 100	< 100	<1	30%	Pass	

Duplicate								
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD		
Perfluorodecanoic acid (PFDA)	S19-JI29279	CP	ug/kg	< 100	< 100	<1	30%	Pass
Perfluoroundecanoic acid (PFUnDA)	S19-JI29279	CP	ug/kg	< 100	< 100	<1	30%	Pass
Perfluorododecanoic acid (PFDoDA)	S19-JI29279	CP	ug/kg	< 100	< 100	<1	30%	Pass
Perfluorotridecanoic acid (PFTrDA)	S19-JI29279	CP	ug/kg	< 100	< 100	<1	30%	Pass
Perfluorotetradecanoic acid (PFTeDA)	S19-JI29279	CP	ug/kg	< 100	< 100	<1	30%	Pass
Duplicate								
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD		
Perfluorooctane sulfonamide (FOSA)	S19-JI29279	CP	ug/kg	< 100	< 100	<1	30%	Pass
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	S19-JI29279	CP	ug/kg	< 100	< 100	<1	30%	Pass
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	S19-JI29279	CP	ug/kg	< 100	< 100	<1	30%	Pass
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	S19-JI29279	CP	ug/kg	< 100	< 100	<1	30%	Pass
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	S19-JI29279	CP	ug/kg	< 100	< 100	<1	30%	Pass
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	S19-JI29279	CP	ug/kg	< 100	< 100	<1	30%	Pass
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	S19-JI29279	CP	ug/kg	< 100	< 100	<1	30%	Pass
Duplicate								
Perfluoroalkyl sulfonic acids (PFSA)				Result 1	Result 2	RPD		
Perfluorobutanesulfonic acid (PFBS)	S19-JI29279	CP	ug/kg	250	260	5.0	30%	Pass
Perfluorononanesulfonic acid (PFNS)	S19-JI29279	CP	ug/kg	< 100	< 100	<1	30%	Pass
Perfluoropropanesulfonic acid (PFPrS)	S19-JI29279	CP	ug/kg	170	170	4.0	30%	Pass
Perfluoropentanesulfonic acid (PFPeS)	S19-JI29279	CP	ug/kg	< 100	< 100	<1	30%	Pass
Perfluorohexanesulfonic acid (PFHxS)	S19-JI29279	CP	ug/kg	330	350	5.0	30%	Pass
Perfluoroheptanesulfonic acid (PFHpS)	S19-JI29279	CP	ug/kg	< 100	< 100	<1	30%	Pass
Perfluorooctanesulfonic acid (PFOS)	S19-JI29279	CP	ug/kg	1900	2000	3.0	30%	Pass
Perfluorodecanesulfonic acid (PFDS)	S19-JI29279	CP	ug/kg	< 100	< 100	<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)	S19-JI29279	CP	ug/kg	< 100	< 100	<1	30%	Pass
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	S19-JI29279	CP	ug/kg	16000	15000	4.0	30%	Pass
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	S19-JI29279	CP	ug/kg	830	850	2.0	30%	Pass
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	S19-JI29279	CP	ug/kg	< 100	< 100	<1	30%	Pass

Comments
Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
G01	The LORs have been raised due to matrix interference
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

Alena Bounkeua	Analytical Services Manager
Bryan Wilson	Senior Analyst-PFAS (QLD)
Julie Kay	Senior Analyst-Inorganic (VIC)


Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

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GHD Pty Ltd NSW
Level 15, 133 Castlereagh Street
Sydney
NSW 2000



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Attention: **Emmylou Cooke**

Report **666984-W**
Project name **ADDITIONAL MONITORING DENILQUIN AND WAGGA WAGGA**
Project ID **2128370**
Received Date **Jul 22, 2019**

Client Sample ID			MW01 Water S19-JI29232 Not Provided	MW02 Water S19-JI29233 Not Provided	MW03 Water S19-JI29234 Not Provided	MW04 Water S19-JI29235 Not Provided
Sample Matrix	LOR	Unit				
Eurofins Sample No.						
Date Sampled						
Test/Reference						
Conductivity (at 25°C)	1	uS/cm	2300	1800	2600	6900
Total Dissolved Solids Dried at 180°C ± 2°C	10	mg/L	1300	1100	1400	3200
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA) ^{N11}	0.05	ug/L	0.06	< 0.05	< 0.05	0.09
Perfluoropentanoic acid (PFPeA) ^{N11}	0.01	ug/L	0.13	< 0.01	< 0.01	0.24
Perfluorohexanoic acid (PFHxA) ^{N11}	0.01	ug/L	^{N09} 0.26	< 0.01	< 0.01	^{N09} 0.33
Perfluoroheptanoic acid (PFHpA) ^{N11}	0.01	ug/L	0.04	< 0.01	< 0.01	0.02
Perfluorooctanoic acid (PFOA) ^{N11}	0.01	ug/L	^{N09} 0.11	< 0.01	< 0.01	< 0.01
Perfluorononanoic acid (PFNA) ^{N11}	0.01	ug/L	0.04	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA) ^{N11}	0.01	ug/L	0.04	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTTrDA) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTTeDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	58	56	67	75
13C5-PFPeA (surr.)	1	%	65	63	73	82
13C5-PFHxA (surr.)	1	%	64	61	76	86
13C4-PFHpA (surr.)	1	%	72	62	87	105
13C8-PFOA (surr.)	1	%	67	71	85	103
13C5-PFNA (surr.)	1	%	70	74	88	104
13C6-PFDA (surr.)	1	%	58	71	87	109
13C2-PFUnDA (surr.)	1	%	58	60	83	93
13C2-PFDoDA (surr.)	1	%	59	61	73	85
13C2-PFTTeDA (surr.)	1	%	73	69	90	63
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05

Client Sample ID			MW01 Water	MW02 Water	MW03 Water	MW04 Water
Sample Matrix			S19-JI29232	S19-JI29233	S19-JI29234	S19-JI29235
Eurofins Sample No.			Not Provided	Not Provided	Not Provided	Not Provided
Date Sampled						
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
13C8-FOSA (surr.)	1	%	79	70	93	104
D3-N-MeFOSA (surr.)	1	%	54	51	65	48
D5-N-EtFOSA (surr.)	1	%	51	49	63	48
D7-N-MeFOSE (surr.)	1	%	49	48	65	69
D9-N-EtFOSE (surr.)	1	%	44	43	55	58
D5-N-EtFOSAA (surr.)	1	%	41	43	54	68
D3-N-MeFOSAA (surr.)	1	%	39	41	54	72
Perfluoroalkyl sulfonic acids (PFASs)						
Perfluorobutanesulfonic acid (PFBS) ^{N11}	0.01	ug/L	0.06	< 0.01	< 0.01	0.17
Perfluorononanesulfonic acid (PFNS) ^{N15}	0.01	ug/L	^{N09} 0.91	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS) ^{N15}	0.01	ug/L	0.03	< 0.01	< 0.01	0.06
Perfluoropentanesulfonic acid (PFPeS) ^{N15}	0.01	ug/L	^{N09} 0.04	< 0.01	< 0.01	^{N09} 0.07
Perfluorohexanesulfonic acid (PFHxS) ^{N11}	0.01	ug/L	^{N09} 0.37	< 0.01	< 0.01	^{N09} 0.03
Perfluoroheptanesulfonic acid (PFHpS) ^{N15}	0.01	ug/L	0.04	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS) ^{N11}	0.01	ug/L	^{N09} 17	< 0.01	< 0.01	^{N09} 0.02
Perfluorodecanesulfonic acid (PFDS) ^{N15}	0.01	ug/L	^{N09} 0.03	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	106	116	136	151
18O2-PFHxS (surr.)	1	%	65	65	82	113
13C8-PFOS (surr.)	1	%	52	71	88	100
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA) ^{N11}	0.05	ug/L	0.29	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA) ^{N11}	0.01	ug/L	0.22	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	177	152	198	INT
13C2-6:2 FTSA (surr.)	1	%	57	49	67	97
13C2-8:2 FTSA (surr.)	1	%	42	27	42	70
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	17.37	< 0.01	< 0.01	0.05
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	17.11	< 0.01	< 0.01	0.02
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	17.48	< 0.01	< 0.01	0.05
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	18.54	< 0.05	< 0.05	0.9
Sum of PFASs (n=30)*	0.1	ug/L	19.67	< 0.1	< 0.1	1.03

Client Sample ID			MW05 Water	MW06 Water	GW503702 Water	GW503704 Water
Sample Matrix			S19-JI29236	S19-JI29237	S19-JI29238	S19-JI29239
Eurofins Sample No.			Not Provided	Not Provided	Not Provided	Not Provided
Date Sampled						
Test/Reference	LOR	Unit				
Conductivity (at 25°C)	1	uS/cm	3000	13000	8700	12000
Total Dissolved Solids Dried at 180°C ± 2°C	10	mg/L	1500	6700	4600	7500

Client Sample ID			MW05 Water S19-JI29236 Not Provided	MW06 Water S19-JI29237 Not Provided	GW503702 Water S19-JI29238 Not Provided	GW503704 Water S19-JI29239 Not Provided
Sample Matrix	LOR	Unit				
Eurofins Sample No.						
Date Sampled						
Test/Reference						
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanoic acid (PFNA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTTrDA) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTTeDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	81	68	60	55
13C5-PFPeA (surr.)	1	%	90	78	62	42
13C5-PFHxA (surr.)	1	%	84	80	62	40
13C4-PFHpA (surr.)	1	%	105	89	65	74
13C8-PFOA (surr.)	1	%	98	82	65	76
13C5-PFNA (surr.)	1	%	105	78	70	92
13C6-PFDA (surr.)	1	%	109	86	68	80
13C2-PFUnDA (surr.)	1	%	90	78	64	82
13C2-PFDoDA (surr.)	1	%	82	78	61	74
13C2-PFTTeDA (surr.)	1	%	66	89	71	90
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluorooctanesulfonamidoacetic acid (N-EtFOSAA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	113	89	74	94
D3-N-MeFOSA (surr.)	1	%	68	58	49	68
D5-N-EtFOSA (surr.)	1	%	60	57	46	67
D7-N-MeFOSE (surr.)	1	%	76	61	52	68
D9-N-EtFOSE (surr.)	1	%	60	52	43	57
D5-N-EtFOSAA (surr.)	1	%	71	50	44	55
D3-N-MeFOSAA (surr.)	1	%	74	51	43	57
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanesulfonic acid (PFDS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	160	135	107	106

Client Sample ID			MW05 Water S19-JI29236 Not Provided	MW06 Water S19-JI29237 Not Provided	GW503702 Water S19-JI29238 Not Provided	GW503704 Water S19-JI29239 Not Provided
Sample Matrix						
Eurofins Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonic acids (PFSA)						
18O2-PFHxS (surr.)	1	%	103	82	68	92
13C8-PFOS (surr.)	1	%	104	77	64	88
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	INT	INT	160	70
13C2-6:2 FTSA (surr.)	1	%	81	72	64	83
13C2-8:2 FTSA (surr.)	1	%	77	51	36	45
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	< 0.1	< 0.1	< 0.1

Client Sample ID			SW01 Water S19-JI29240 Not Provided	SW02 Water S19-JI29241 Not Provided	SW03 Water S19-JI29242 Not Provided	SW04 Water S19-JI29243 Not Provided
Sample Matrix						
Eurofins Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA) ^{N11}	0.01	ug/L	0.07	0.02	0.09	0.05
Perfluorohexanoic acid (PFHxA) ^{N11}	0.01	ug/L	^{NO9} 0.07	^{NO9} 0.02	^{NO9} 0.10	0.02
Perfluoroheptanoic acid (PFHpA) ^{N11}	0.01	ug/L	0.03	< 0.01	0.04	< 0.01
Perfluorooctanoic acid (PFOA) ^{N11}	0.01	ug/L	^{NO9} 0.03	< 0.01	^{NO9} 0.03	< 0.01
Perfluorononanoic acid (PFNA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	0.02	< 0.01
Perfluorodecanoic acid (PFDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTeDA) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	54	56	58	36
13C5-PFPeA (surr.)	1	%	65	58	63	42
13C5-PFHxA (surr.)	1	%	65	70	71	68
13C4-PFHpA (surr.)	1	%	65	74	79	24
13C8-PFOA (surr.)	1	%	70	77	76	45
13C5-PFNA (surr.)	1	%	74	63	76	74
13C6-PFDA (surr.)	1	%	78	64	74	35
13C2-PFUnDA (surr.)	1	%	65	66	77	27
13C2-PFDoDA (surr.)	1	%	64	61	71	48
13C2-PFTeDA (surr.)	1	%	70	73	83	80

Client Sample ID			SW01 Water S19-JI29240 Not Provided	SW02 Water S19-JI29241 Not Provided	SW03 Water S19-JI29242 Not Provided	SW04 Water S19-JI29243 Not Provided
Sample Matrix	LOR	Unit				
Eurofins Sample No.						
Date Sampled						
Test/Reference						
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	79	70	90	133
D3-N-MeFOSA (surr.)	1	%	52	49	57	60
D5-N-EtFOSA (surr.)	1	%	53	50	60	57
D7-N-MeFOSE (surr.)	1	%	54	53	62	146
D9-N-EtFOSE (surr.)	1	%	48	45	51	129
D5-N-EtFOSAA (surr.)	1	%	48	46	48	157
D3-N-MeFOSAA (surr.)	1	%	50	53	51	77
Perfluoroalkyl sulfonic acids (PFASs)						
Perfluorobutanesulfonic acid (PFBS) ^{N11}	0.01	ug/L	0.02	0.02	0.02	< 0.01
Perfluorononanesulfonic acid (PFNS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS) ^{N15}	0.01	ug/L	0.01	< 0.01	0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS) ^{N15}	0.01	ug/L	< 0.01	^{N09} 0.01	^{N09} 0.02	< 0.01
Perfluorohexanesulfonic acid (PFHxS) ^{N11}	0.01	ug/L	^{N09} 0.06	^{N09} 0.06	^{N09} 0.15	0.03
Perfluoroheptanesulfonic acid (PFHpS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	^{N09} 0.02	^{N09} 0.02
Perfluorooctanesulfonic acid (PFOS) ^{N11}	0.01	ug/L	^{N09} 0.41	^{N09} 0.22	^{N09} 0.86	^{N09} 0.43
Perfluorodecanesulfonic acid (PFDS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	111	118	134	64
18O2-PFHxS (surr.)	1	%	75	76	73	105
13C8-PFOS (surr.)	1	%	65	60	73	137
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	159	179	189	103
13C2-6:2 FTSA (surr.)	1	%	70	70	57	INT
13C2-8:2 FTSA (surr.)	1	%	39	44	58	42
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	0.47	0.28	1.01	0.46
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.44	0.22	0.89	0.43
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.5	0.28	1.04	0.46
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	0.69	0.34	1.29	0.53
Sum of PFASs (n=30)*	0.1	ug/L	0.7	0.35	1.36	0.55

Client Sample ID			SW05 Water S19-JI29244 Not Provided	SW06 Water S19-JI29245 Not Provided	SW07 Water S19-JI29246 Not Provided	SW08 Water S19-JI29247 Not Provided
Sample Matrix						
Eurofins Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA) ^{N11}	0.01	ug/L	0.02	0.01	0.02	0.02
Perfluorohexanoic acid (PFHxA) ^{N11}	0.01	ug/L	0.04	0.04	0.04	0.03
Perfluoroheptanoic acid (PFHpA) ^{N11}	0.01	ug/L	0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA) ^{N11}	0.01	ug/L	^{N09} 0.04	^{N09} 0.02	^{N09} 0.01	^{N09} 0.02
Perfluorononanoic acid (PFNA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTTrDA) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTTeDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	64	85	65	71
13C5-PFPeA (surr.)	1	%	80	76	68	69
13C5-PFHxA (surr.)	1	%	116	122	110	110
13C4-PFHpA (surr.)	1	%	86	71	76	88
13C8-PFOA (surr.)	1	%	89	96	98	94
13C5-PFNA (surr.)	1	%	142	133	139	137
13C6-PFDA (surr.)	1	%	88	95	94	96
13C2-PFUnDA (surr.)	1	%	101	100	99	102
13C2-PFDoDA (surr.)	1	%	102	110	97	123
13C2-PFTTeDA (surr.)	1	%	66	62	59	87
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	116	126	118	130
D3-N-MeFOSA (surr.)	1	%	69	75	49	72
D5-N-EtFOSA (surr.)	1	%	74	74	50	63
D7-N-MeFOSE (surr.)	1	%	134	144	103	136
D9-N-EtFOSE (surr.)	1	%	123	146	101	125
D5-N-EtFOSAA (surr.)	1	%	92	78	88	102
D3-N-MeFOSAA (surr.)	1	%	109	94	109	123
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS) ^{N11}	0.01	ug/L	0.02	0.01	0.02	0.02
Perfluorononanesulfonic acid (PFNS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS) ^{N15}	0.01	ug/L	^{N09} 0.03	^{N09} 0.01	^{N09} 0.02	^{N09} 0.02
Perfluorohexanesulfonic acid (PFHxS) ^{N11}	0.01	ug/L	^{N09} 0.14	^{N09} 0.05	^{N09} 0.05	^{N09} 0.07
Perfluoroheptanesulfonic acid (PFHpS) ^{N15}	0.01	ug/L	^{N09} 0.01	^{N09} 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS) ^{N11}	0.01	ug/L	^{N09} 0.53	^{N09} 0.18	^{N09} 0.04	^{N09} 0.39
Perfluorodecanesulfonic acid (PFDS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	84	73	77	81

Client Sample ID			SW05 Water S19-JI29244 Not Provided	SW06 Water S19-JI29245 Not Provided	SW07 Water S19-JI29246 Not Provided	SW08 Water S19-JI29247 Not Provided
Sample Matrix						
Eurofins Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonic acids (PFSA)						
18O2-PFHxS (surr.)	1	%	105	101	110	102
13C8-PFOS (surr.)	1	%	100	135	135	116
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	132	120	117	131
13C2-6:2 FTSA (surr.)	1	%	INT	153	185	186
13C2-8:2 FTSA (surr.)	1	%	92	88	86	86
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	0.67	0.23	0.09	0.46
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.57	0.2	0.05	0.41
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.71	0.25	0.1	0.48
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	0.8	0.31	0.18	0.55
Sum of PFASs (n=30)*	0.1	ug/L	0.84	0.33	0.2	0.57

Client Sample ID			SW09 Water S19-JI29248 Not Provided	SW10 Water S19-JI29249 Not Provided	SW11 Water S19-JI29250 Not Provided	SWBD01 Water S19-JI29272 Not Provided
Sample Matrix						
Eurofins Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCA)						
Perfluorobutanoic acid (PFBA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA) ^{N11}	0.01	ug/L	0.02	< 0.01	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA) ^{N11}	0.01	ug/L	0.03	< 0.01	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanoic acid (PFNA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTeDA) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	72	96	100	90
13C5-PFPeA (surr.)	1	%	68	74	109	86
13C5-PFHxA (surr.)	1	%	125	131	129	104
13C4-PFHpA (surr.)	1	%	82	87	105	84
13C8-PFOA (surr.)	1	%	90	107	87	106
13C5-PFNA (surr.)	1	%	121	120	95	116
13C6-PFDA (surr.)	1	%	98	100	85	93
13C2-PFUnDA (surr.)	1	%	97	103	91	92
13C2-PFDoDA (surr.)	1	%	102	118	98	103
13C2-PFTeDA (surr.)	1	%	73	85	66	61

Client Sample ID			SW09 Water S19-JI29248 Not Provided	SW10 Water S19-JI29249 Not Provided	SW11 Water S19-JI29250 Not Provided	SWBD01 Water S19-JI29272 Not Provided
Sample Matrix	LOR	Unit				
Eurofins Sample No.						
Date Sampled						
Test/Reference						
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	127	130	131	118
D3-N-MeFOSA (surr.)	1	%	60	86	96	62
D5-N-EtFOSA (surr.)	1	%	53	79	84	63
D7-N-MeFOSE (surr.)	1	%	124	141	151	116
D9-N-EtFOSE (surr.)	1	%	142	142	138	105
D5-N-EtFOSAA (surr.)	1	%	79	93	67	80
D3-N-MeFOSAA (surr.)	1	%	96	113	76	100
Perfluoroalkyl sulfonic acids (PFSA)						
Perfluorobutanesulfonic acid (PFBS) ^{N11}	0.01	ug/L	0.02	< 0.01	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS) ^{N15}	0.01	ug/L	^{N09} 0.02	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS) ^{N11}	0.01	ug/L	^{N09} 0.03	< 0.01	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS) ^{N11}	0.01	ug/L	< 0.01	^{N09} 0.02	< 0.01	^{N09} 0.03
Perfluorodecanesulfonic acid (PFDS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	68	82	92	78
18O2-PFHxS (surr.)	1	%	97	110	98	107
13C8-PFOS (surr.)	1	%	131	135	118	127
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	143	153	124	132
13C2-6:2 FTSA (surr.)	1	%	172	INT	125	162
13C2-8:2 FTSA (surr.)	1	%	91	89	88	84
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	0.03	0.02	< 0.01	0.03
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01	0.02	< 0.01	0.03
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.03	0.02	< 0.01	0.03
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	0.1	< 0.05	< 0.05	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	0.12	< 0.1	< 0.1	< 0.1

Client Sample ID			SWBD02 Water S19-JI29273 Not Provided	GWBD01 Water S19-JI29274 Not Provided	RIN01 Water S19-JI29275 Not Provided	10492_RNSD1 Water S19-JI29276 Not Provided
Sample Matrix	LOR	Unit				
Eurofins Sample No.						
Date Sampled						
Test/Reference						
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	0.12
Perfluoropentanoic acid (PFPeA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	0.30
Perfluorohexanoic acid (PFHxA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	0.28
Perfluoroheptanoic acid (PFHpA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	0.04
Perfluorooctanoic acid (PFOA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	^{N09} 0.05
Perfluorononanoic acid (PFNA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTTrDA) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTTeDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	104	101	116	95
13C5-PFPeA (surr.)	1	%	92	100	104	79
13C5-PFHxA (surr.)	1	%	154	133	169	113
13C4-PFHpA (surr.)	1	%	97	104	104	101
13C8-PFOA (surr.)	1	%	95	112	111	102
13C5-PFNA (surr.)	1	%	102	96	106	106
13C6-PFDA (surr.)	1	%	83	86	104	97
13C2-PFUnDA (surr.)	1	%	80	96	115	112
13C2-PFDoDA (surr.)	1	%	87	100	122	166
13C2-PFTTeDA (surr.)	1	%	52	64	74	77
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	^{N09} < 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	113	126	107	172
D3-N-MeFOSA (surr.)	1	%	53	54	66	93
D5-N-EtFOSA (surr.)	1	%	48	48	57	74
D7-N-MeFOSE (surr.)	1	%	96	110	107	118
D9-N-EtFOSE (surr.)	1	%	94	102	134	138
D5-N-EtFOSAA (surr.)	1	%	72	74	79	79
D3-N-MeFOSAA (surr.)	1	%	91	86	100	139
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	0.03
Perfluorononanesulfonic acid (PFNS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	0.03
Perfluoropentanesulfonic acid (PFPeS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	^{N09} 0.02
Perfluorohexanesulfonic acid (PFHxS) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	^{N09} 0.05
Perfluoroheptanesulfonic acid (PFHpS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	^{N09} 0.18
Perfluorodecanesulfonic acid (PFDS) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	98	103	108	77

Client Sample ID			SWBD02 Water S19-JI29273 Not Provided	GWBD01 Water S19-JI29274 Not Provided	RIN01 Water S19-JI29275 Not Provided	10492_RNSD1 Water S19-JI29276 Not Provided
Sample Matrix						
Eurofins Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonic acids (PFSA)						
18O2-PFHxS (surr.)	1	%	101	99	102	86
13C8-PFOS (surr.)	1	%	115	124	137	126
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05	< 0.05	1.2
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA) ^{N11}	0.01	ug/L	< 0.01	< 0.01	< 0.01	0.25
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA) ^{N15}	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	136	125	125	119
13C2-6:2 FTSA (surr.)	1	%	143	119	108	156
13C2-8:2 FTSA (surr.)	1	%	87	93	96	86
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	0.23
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	0.23
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	0.28
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	< 0.05	< 0.05	2.5
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	< 0.1	< 0.1	2.55

Client Sample ID			10492_RNSD2 Water S19-JI29277 Not Provided	FTBD01 Water S19-JI29278 Not Provided
Sample Matrix				
Eurofins Sample No.				
Date Sampled				
Test/Reference	LOR	Unit		
Perfluoroalkyl carboxylic acids (PFCA)				
Perfluorobutanoic acid (PFBA) ^{N11}	0.05	ug/L	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA) ^{N11}	0.01	ug/L	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA) ^{N11}	0.01	ug/L	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA) ^{N11}	0.01	ug/L	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA) ^{N11}	0.01	ug/L	< 0.01	< 0.01
Perfluorononanoic acid (PFNA) ^{N11}	0.01	ug/L	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTTrDA) ^{N15}	0.01	ug/L	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA) ^{N11}	0.01	ug/L	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	100	90
13C5-PFPeA (surr.)	1	%	105	80
13C5-PFHxA (surr.)	1	%	148	130
13C4-PFHpA (surr.)	1	%	125	108
13C8-PFOA (surr.)	1	%	112	100
13C5-PFNA (surr.)	1	%	129	116
13C6-PFDA (surr.)	1	%	104	91
13C2-PFUnDA (surr.)	1	%	119	109
13C2-PFDoDA (surr.)	1	%	107	106
13C2-PFTeDA (surr.)	1	%	72	75

Client Sample ID			10492_RNSD2	FTBD01
Sample Matrix			Water	Water
Eurofins Sample No.			S19-JI29277	S19-JI29278
Date Sampled			Not Provided	Not Provided
Test/Reference	LOR	Unit		
Perfluoroalkyl sulfonamido substances				
Perfluorooctane sulfonamide (FOSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA) ^{N11}	0.05	ug/L	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) ^{N11}	0.05	ug/L	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE) ^{N11}	0.05	ug/L	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA) ^{N11}	0.05	ug/L	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) ^{N11}	0.05	ug/L	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	112	116
D3-N-MeFOSA (surr.)	1	%	25	67
D5-N-EtFOSA (surr.)	1	%	20	54
D7-N-MeFOSE (surr.)	1	%	56	93
D9-N-EtFOSE (surr.)	1	%	73	89
D5-N-EtFOSAA (surr.)	1	%	79	89
D3-N-MeFOSAA (surr.)	1	%	96	117
Perfluoroalkyl sulfonic acids (PFASs)				
Perfluorobutanesulfonic acid (PFBS) ^{N11}	0.01	ug/L	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS) ^{N15}	0.01	ug/L	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS) ^{N15}	0.01	ug/L	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS) ^{N15}	0.01	ug/L	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS) ^{N11}	0.01	ug/L	^{N09} 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS) ^{N15}	0.01	ug/L	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS) ^{N11}	0.01	ug/L	^{N09} 0.30	^{N09} 0.03
Perfluorodecanesulfonic acid (PFDS) ^{N15}	0.01	ug/L	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	97	87
18O2-PFHxS (surr.)	1	%	104	89
13C8-PFOS (surr.)	1	%	112	125
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)				
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA) ^{N11}	0.01	ug/L	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA) ^{N11}	0.05	ug/L	< 0.05	0.07
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA) ^{N11}	0.01	ug/L	0.02	0.03
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA) ^{N15}	0.01	ug/L	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	139	123
13C2-6:2 FTSA (surr.)	1	%	INT	188
13C2-8:2 FTSA (surr.)	1	%	97	80
PFASs Summations				
Sum (PFHxS + PFOS)*	0.01	ug/L	0.31	0.03
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.3	0.03
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.31	0.03
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	0.33	0.13
Sum of PFASs (n=30)*	0.1	ug/L	0.33	0.13

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported. A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

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
Conductivity (at 25°C) - Method: LTM-INO-4030 Conductivity	Melbourne	Jul 24, 2019	28 Days
Total Dissolved Solids Dried at 180°C ± 2°C - Method: LTM-INO-4170 Total Dissolved Solids in Water	Melbourne	Jul 23, 2019	7 Days
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs) - Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)	Brisbane	Jul 23, 2019	14 Days
Perfluoroalkyl sulfonamido substances - Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)	Brisbane	Jul 23, 2019	14 Days
Perfluoroalkyl sulfonic acids (PFASs) - Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)	Brisbane	Jul 23, 2019	14 Days
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs) - Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)	Brisbane	Jul 23, 2019	14 Days

Company Name: GHD Pty Ltd NSW	Order No.: 2128370	Received: Jul 22, 2019 9:00 AM
Address: Level 15, 133 Castlereagh Street Sydney NSW 2000	Report #: 666984	Due: Jul 29, 2019
	Phone: 02 9239 7100	Priority: 5 Day
	Fax: 02 9239 7199	Contact Name: Emmylou Cooke
Project Name: ADDITIONAL MONITORING DENILQUIN AND WAGGA WAGGA		
Project ID: 2128370		

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Conductivity (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Organic Carbon	AUS Leaching Procedure	Moisture Set	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X		X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794									X	X	X	X
Perth Laboratory - NATA Site # 23736												
External Laboratory												
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID							
1	MW01	Not Provided		Water	S19-JI29232	X	X					X
2	MW02	Not Provided		Water	S19-JI29233	X	X					X
3	MW03	Not Provided		Water	S19-JI29234	X	X					X
4	MW04	Not Provided		Water	S19-JI29235	X	X					X
5	MW05	Not Provided		Water	S19-JI29236	X	X					X
6	MW06	Not Provided		Water	S19-JI29237	X	X					X
7	GW503702	Not Provided		Water	S19-JI29238	X	X					X
8	GW503704	Not Provided		Water	S19-JI29239	X	X					X
9	SW01	Not Provided		Water	S19-JI29240							X

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Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Conductivity (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Organic Carbon	AUS Leaching Procedure	Moisture Set	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X		X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794									X	X	X	X
Perth Laboratory - NATA Site # 23736												
10	SW02	Not Provided		Water	S19-JI29241							X
11	SW03	Not Provided		Water	S19-JI29242							X
12	SW04	Not Provided		Water	S19-JI29243							X
13	SW05	Not Provided		Water	S19-JI29244							X
14	SW06	Not Provided		Water	S19-JI29245							X
15	SW07	Not Provided		Water	S19-JI29246							X
16	SW08	Not Provided		Water	S19-JI29247							X
17	SW09	Not Provided		Water	S19-JI29248							X
18	SW10	Not Provided		Water	S19-JI29249							X
19	SW11	Not Provided		Water	S19-JI29250							X
20	SS01	Not Provided		Soil	S19-JI29251			X	X			X
21	SS02	Not Provided		Soil	S19-JI29252			X	X			X

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Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Conductivity (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Organic Carbon	AUS Leaching Procedure	Moisture Set	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X		X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794									X	X	X	X
Perth Laboratory - NATA Site # 23736												
22	SS03	Not Provided		Soil	S19-JI29253			X	X	X	X	
23	SS04	Not Provided		Soil	S19-JI29254			X	X	X	X	
24	SS05	Not Provided		Soil	S19-JI29255			X	X	X	X	
25	SS06	Not Provided		Soil	S19-JI29256			X	X	X	X	
26	SS07	Not Provided		Soil	S19-JI29257			X	X	X	X	
27	SS08	Not Provided		Soil	S19-JI29258			X	X	X	X	
28	SS09	Not Provided		Soil	S19-JI29259			X	X	X	X	
29	SS10	Not Provided		Soil	S19-JI29260			X	X	X	X	
30	SS11	Not Provided		Soil	S19-JI29261			X	X	X	X	
31	SS12	Not Provided		Soil	S19-JI29262			X	X	X	X	
32	SS13	Not Provided		Soil	S19-JI29263			X	X	X	X	
33	SS14	Not Provided		Soil	S19-JI29264			X	X	X	X	

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Sample Detail						Conductivity (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Organic Carbon	AUS Leaching Procedure	Moisture Set	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X		X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794									X	X	X	X
Perth Laboratory - NATA Site # 23736												
34	SS15	Not Provided		Soil	S19-JI29265			X	X		X	
35	SS16	Not Provided		Soil	S19-JI29266			X	X		X	
36	SS17	Not Provided		Soil	S19-JI29267			X	X		X	
37	SS18	Not Provided		Soil	S19-JI29268			X	X		X	
38	SS19	Not Provided		Soil	S19-JI29269			X	X		X	
39	SSBD01	Not Provided		Soil	S19-JI29270					X	X	
40	SSBD02	Not Provided		Soil	S19-JI29271					X	X	
41	SWBD01	Not Provided		Water	S19-JI29272						X	
42	SWBD02	Not Provided		Water	S19-JI29273						X	
43	GWBD01	Not Provided		Water	S19-JI29274						X	
44	RIN01	Not Provided		Water	S19-JI29275						X	
45	10492_RNSD1	Not Provided		Water	S19-JI29276						X	

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Sample Detail						Conductivity (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Organic Carbon	AUS Leaching Procedure	Moisture Set	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X		X	X	
Sydney Laboratory - NATA Site # 18217												
Brisbane Laboratory - NATA Site # 20794									X	X	X	X
Perth Laboratory - NATA Site # 23736												
46	10492_RNSD2	Not Provided		Water	S19-JI29277							X
47	FTBD01	Not Provided		Water	S19-JI29278							X
48	10492_RNCB F0	Not Provided		Product	S19-JI29279							X
49	SS01	Not Provided		AUS Leachate - Reagent Water	S19-JI29280				X			X
50	SS02	Not Provided		AUS Leachate - Reagent Water	S19-JI29281				X			X
51	SS03	Not Provided		AUS Leachate - Reagent Water	S19-JI29282				X			X
52	SS04	Not Provided		AUS Leachate - Reagent	S19-JI29283				X			X

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Project ID: 2128370		

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Sample Detail				Conductivity (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Organic Carbon	AUS Leaching Procedure	Moisture Set	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271				X	X	X		X	X	
Sydney Laboratory - NATA Site # 18217										
Brisbane Laboratory - NATA Site # 20794							X	X	X	X
Perth Laboratory - NATA Site # 23736										
			Water							
53	SS05	Not Provided	AUS Leachate - Reagent Water				X			X
54	SS06	Not Provided	AUS Leachate - Reagent Water				X			X
55	SS07	Not Provided	AUS Leachate - Reagent Water				X			X
56	SS08	Not Provided	AUS Leachate - Reagent Water				X			X
57	SS09	Not Provided	AUS Leachate - Reagent				X			X

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Project ID:	2128370	Fax:	02 9239 7199	Contact Name:	Emmylou Cooke

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail					Conductivity (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Organic Carbon	AUS Leaching Procedure	Moisture Set	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271					X	X	X		X	X	
Sydney Laboratory - NATA Site # 18217											
Brisbane Laboratory - NATA Site # 20794								X	X	X	X
Perth Laboratory - NATA Site # 23736											
				Water							
58	SS10	Not Provided		AUS Leachate - Reagent Water				X			X
59	SS11	Not Provided		AUS Leachate - Reagent Water				X			X
60	SS12	Not Provided		AUS Leachate - Reagent Water				X			X
61	SS13	Not Provided		AUS Leachate - Reagent Water				X			X
62	SS14	Not Provided		AUS Leachate - Reagent				X			X

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Sample Detail				Conductivity (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Organic Carbon	AUS Leaching Procedure	Moisture Set	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271				X	X	X		X	X	
Sydney Laboratory - NATA Site # 18217										
Brisbane Laboratory - NATA Site # 20794							X	X	X	X
Perth Laboratory - NATA Site # 23736										
			Water							
63	SS15	Not Provided	AUS Leachate - Reagent Water				X			X
64	SS16	Not Provided	AUS Leachate - Reagent Water				X			X
65	SS17	Not Provided	AUS Leachate - Reagent Water				X			X
66	SS18	Not Provided	AUS Leachate - Reagent Water				X			X
67	SS19	Not Provided	AUS Leachate - Reagent				X			X

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Sample Detail	Conductivity (at 25°C)	Total Dissolved Solids Dried at 180°C ± 2°C	Total Organic Carbon	AUS Leaching Procedure	Moisture Set	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271	X	X	X		X	X	
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794				X	X	X	X
Perth Laboratory - NATA Site # 23736							
Water							
Test Counts	8	8	19	19	21	21	67

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.

****NOTE:** pH duplicates are reported as a range NOT as RPD

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

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

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%

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 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

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.
- Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
- Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
- Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
- 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.
- Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
- For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
- Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Method Blank						
Total Dissolved Solids Dried at 180°C ± 2°C	mg/L	< 10		10	Pass	
Method Blank						
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05		0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01		0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01		0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01		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 (PFTTeDA)	ug/L	< 0.01		0.01	Pass	
Method Blank						
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05		0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05		0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05		0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	ug/L	< 0.05		0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	ug/L	< 0.05		0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05		0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05		0.05	Pass	
Method Blank						
Perfluoroalkyl sulfonic acids (PFSA)						
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01		0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01		0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01		0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01		0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01		0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01		0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01		0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01		0.01	Pass	
Method Blank						
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01		0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	ug/L	< 0.05		0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01		0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01		0.01	Pass	
LCS - % Recovery						
Total Dissolved Solids Dried at 180°C ± 2°C	%	99		70-130	Pass	
LCS - % Recovery						
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)	%	99		50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	63		50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	116		50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	104		50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	123		50-150	Pass	
Perfluorononanoic acid (PFNA)	%	99		50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	93		50-150	Pass	

Test	Units	Result 1	Acceptance Limits	Pass Limits	Qualifying Code		
Perfluoroundecanoic acid (PFUnDA)	%	106	50-150	Pass			
Perfluorododecanoic acid (PFDoDA)	%	112	50-150	Pass			
Perfluorotridecanoic acid (PFTrDA)	%	81	50-150	Pass			
Perfluorotetradecanoic acid (PFTeDA)	%	103	50-150	Pass			
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	107	50-150	Pass			
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	117	50-150	Pass			
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	90	50-150	Pass			
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	%	103	50-150	Pass			
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	%	77	50-150	Pass			
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	118	50-150	Pass			
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	99	50-150	Pass			
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSA's)							
Perfluorobutanesulfonic acid (PFBS)	%	83	50-150	Pass			
Perfluorononanesulfonic acid (PFNS)	%	54	50-150	Pass			
Perfluoropropanesulfonic acid (PFPrS)	%	105	50-150	Pass			
Perfluoropentanesulfonic acid (PFPeS)	%	106	50-150	Pass			
Perfluorohexanesulfonic acid (PFHxS)	%	72	50-150	Pass			
Perfluoroheptanesulfonic acid (PFHpS)	%	134	50-150	Pass			
Perfluorooctanesulfonic acid (PFOS)	%	107	50-150	Pass			
Perfluorodecanesulfonic acid (PFDS)	%	50	50-150	Pass			
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSA's)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	94	50-150	Pass			
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	%	73	50-150	Pass			
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	73	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
Spike - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	S19-JI29276	CP	%	85	50-150	Pass	
Perfluoropentanoic acid (PFPeA)	S19-JI29276	CP	%	68	50-150	Pass	
Perfluorohexanoic acid (PFHxA)	S19-JI29276	CP	%	103	50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	S19-JI29276	CP	%	103	50-150	Pass	
Perfluorooctanoic acid (PFOA)	S19-JI29276	CP	%	111	50-150	Pass	
Perfluorononanoic acid (PFNA)	S19-JI29276	CP	%	97	50-150	Pass	
Perfluorodecanoic acid (PFDA)	S19-JI29276	CP	%	90	50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	S19-JI29276	CP	%	106	50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	S19-JI29276	CP	%	106	50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	S19-JI29276	CP	%	57	50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	S19-JI29276	CP	%	81	50-150	Pass	
Spike - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	S19-JI29276	CP	%	91	50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	S19-JI29276	CP	%	107	50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	S19-JI29276	CP	%	72	50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	S19-JI29276	CP	%	55			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	S19-JI29276	CP	%	55			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	S19-JI29276	CP	%	113			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	S19-JI29276	CP	%	90			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSA's)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	S19-JI29276	CP	%	85			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	S19-JI29276	CP	%	78			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	S19-JI29276	CP	%	128			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	S19-JI29276	CP	%	111			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	S19-JI29276	CP	%	79			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	S19-JI29276	CP	%	107			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	S19-JI29276	CP	%	89			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	S19-JI29276	CP	%	61			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSA's)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	S19-JI29276	CP	%	88			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	S19-JI29276	CP	%	76			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	S19-JI29276	CP	%	74			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	S19-JI29276	CP	%	123			50-150	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (at 25°C)	M19-JI23118	NCP	uS/cm	310	310	<1	30%	Pass	
Total Dissolved Solids Dried at 180°C ± 2°C	M19-JI29385	NCP	mg/L	1200	1200	6.0	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCA's)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	S19-JI29274	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	S19-JI29274	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	S19-JI29274	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	S19-JI29274	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	S19-JI29274	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	S19-JI29274	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	S19-JI29274	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	S19-JI29274	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	S19-JI29274	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate								
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD		
Perfluorotridecanoic acid (PFTrDA)	S19-JI29274	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorotetradecanoic acid (PFTeDA)	S19-JI29274	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Duplicate								
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD		
Perfluorooctane sulfonamide (FOSA)	S19-JI29274	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	S19-JI29274	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	S19-JI29274	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	S19-JI29274	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	S19-JI29274	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	S19-JI29274	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	S19-JI29274	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
Duplicate								
Perfluoroalkyl sulfonic acids (PFSA's)				Result 1	Result 2	RPD		
Perfluorobutanesulfonic acid (PFBS)	S19-JI29274	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorononanesulfonic acid (PFNS)	S19-JI29274	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoropropanesulfonic acid (PFPrS)	S19-JI29274	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoropentanesulfonic acid (PFPeS)	S19-JI29274	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorohexanesulfonic acid (PFHxS)	S19-JI29274	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoroheptanesulfonic acid (PFHpS)	S19-JI29274	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorooctanesulfonic acid (PFOS)	S19-JI29274	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorodecanesulfonic acid (PFDS)	S19-JI29274	CP	ug/L	< 0.01	< 0.01	<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)	S19-JI29274	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	S19-JI29274	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	S19-JI29274	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	S19-JI29274	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Duplicate								
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD		
Perfluorobutanoic acid (PFBA)	S19-JI29275	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
Perfluoropentanoic acid (PFPeA)	S19-JI29275	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorohexanoic acid (PFHxA)	S19-JI29275	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoroheptanoic acid (PFHpA)	S19-JI29275	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorooctanoic acid (PFOA)	S19-JI29275	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorononanoic acid (PFNA)	S19-JI29275	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorodecanoic acid (PFDA)	S19-JI29275	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass

Duplicate								
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD		
Perfluoroundecanoic acid (PFUnDA)	S19-JI29275	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorododecanoic acid (PFDoDA)	S19-JI29275	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorotridecanoic acid (PFTrDA)	S19-JI29275	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorotetradecanoic acid (PFTeDA)	S19-JI29275	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Duplicate								
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD		
Perfluorooctane sulfonamide (FOSA)	S19-JI29275	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	S19-JI29275	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	S19-JI29275	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	S19-JI29275	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	S19-JI29275	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	S19-JI29275	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	S19-JI29275	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
Duplicate								
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD		
Perfluorobutanesulfonic acid (PFBS)	S19-JI29275	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorononanesulfonic acid (PFNS)	S19-JI29275	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoropropanesulfonic acid (PFPrS)	S19-JI29275	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoropentanesulfonic acid (PFPeS)	S19-JI29275	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorohexanesulfonic acid (PFHxS)	S19-JI29275	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoroheptanesulfonic acid (PFHpS)	S19-JI29275	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorooctanesulfonic acid (PFOS)	S19-JI29275	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorodecanesulfonic acid (PFDS)	S19-JI29275	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)	S19-JI29275	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	S19-JI29275	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	S19-JI29275	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	S19-JI29275	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Duplicate								
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD		
Perfluorobutanoic acid (PFBA)	S19-JI29277	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
Perfluoropentanoic acid (PFPeA)	S19-JI29277	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorohexanoic acid (PFHxA)	S19-JI29277	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoroheptanoic acid (PFHpA)	S19-JI29277	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass

Duplicate								
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD		
Perfluorooctanoic acid (PFOA)	S19-JI29277	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorononanoic acid (PFNA)	S19-JI29277	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorodecanoic acid (PFDA)	S19-JI29277	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoroundecanoic acid (PFUnDA)	S19-JI29277	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorododecanoic acid (PFDoDA)	S19-JI29277	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorotridecanoic acid (PFTrDA)	S19-JI29277	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorotetradecanoic acid (PFTeDA)	S19-JI29277	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Duplicate								
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD		
Perfluorooctane sulfonamide (FOSA)	S19-JI29277	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	S19-JI29277	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	S19-JI29277	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	S19-JI29277	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	S19-JI29277	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	S19-JI29277	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	S19-JI29277	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
Duplicate								
Perfluoroalkyl sulfonic acids (PFSA)				Result 1	Result 2	RPD		
Perfluorobutanesulfonic acid (PFBS)	S19-JI29277	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorononanesulfonic acid (PFNS)	S19-JI29277	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoropropanesulfonic acid (PFPrS)	S19-JI29277	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoropentanesulfonic acid (PFPeS)	S19-JI29277	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorohexanesulfonic acid (PFHxS)	S19-JI29277	CP	ug/L	0.01	0.02	5.0	30%	Pass
Perfluoroheptanesulfonic acid (PFHpS)	S19-JI29277	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorooctanesulfonic acid (PFOS)	S19-JI29277	CP	ug/L	0.30	0.28	7.0	30%	Pass
Perfluorodecanesulfonic acid (PFDS)	S19-JI29277	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)	S19-JI29277	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	S19-JI29277	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	S19-JI29277	CP	ug/L	0.02	0.02	<1	30%	Pass
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	S19-JI29277	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass

Duplicate								
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD		
Perfluorobutanoic acid (PFBA)	S19-JI29278	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
Perfluoropentanoic acid (PFPeA)	S19-JI29278	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorohexanoic acid (PFHxA)	S19-JI29278	CP	ug/L	< 0.01	0.01	3.0	30%	Pass
Perfluoroheptanoic acid (PFHpA)	S19-JI29278	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorooctanoic acid (PFOA)	S19-JI29278	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorononanoic acid (PFNA)	S19-JI29278	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorodecanoic acid (PFDA)	S19-JI29278	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoroundecanoic acid (PFUnDA)	S19-JI29278	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorododecanoic acid (PFDoDA)	S19-JI29278	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorotridecanoic acid (PFTrDA)	S19-JI29278	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorotetradecanoic acid (PFTeDA)	S19-JI29278	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Duplicate								
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD		
Perfluorooctane sulfonamide (FOSA)	S19-JI29278	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	S19-JI29278	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	S19-JI29278	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	S19-JI29278	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	S19-JI29278	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	S19-JI29278	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	S19-JI29278	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass
Duplicate								
Perfluoroalkyl sulfonic acids (PFSA)				Result 1	Result 2	RPD		
Perfluorobutanesulfonic acid (PFBS)	S19-JI29278	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorononanesulfonic acid (PFNS)	S19-JI29278	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoropropanesulfonic acid (PFPrS)	S19-JI29278	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoropentanesulfonic acid (PFPeS)	S19-JI29278	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorohexanesulfonic acid (PFHxS)	S19-JI29278	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluoroheptanesulfonic acid (PFHpS)	S19-JI29278	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
Perfluorooctanesulfonic acid (PFOS)	S19-JI29278	CP	ug/L	0.03	0.03	1.0	30%	Pass
Perfluorodecanesulfonic acid (PFDS)	S19-JI29278	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)	S19-JI29278	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	S19-JI29278	CP	ug/L	0.07	0.07	1.0	30%	Pass
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	S19-JI29278	CP	ug/L	0.03	0.03	4.0	30%	Pass
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	S19-JI29278	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	Yes
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

Alena Bounkeua	Analytical Services Manager
Bryan Wilson	Senior Analyst-PFAS (QLD)
Julie Kay	Senior Analyst-Inorganic (VIC)


Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

CERTIFICATE OF ANALYSIS

Work Order : **ES1923114**
Client : **GHD PTY LTD**
Contact : **MS EMMYLOU COOKE**
Address : **LEVEL 15, 133 CASTLEREAGH STREET**
SYDNEY NSW, AUSTRALIA 2000

Telephone : **----**
Project : **2128370**
Order number : **2128370**
C-O-C number : **----**
Sampler : **----**
Site : **----**
Quote number : **EN/005/18**
No. of samples received : **6**
No. of samples analysed : **6**

Page : 1 of 7
Laboratory : Environmental Division Sydney
Contact : Customer Services ES
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164

Telephone : +61-2-8784 8555
Date Samples Received : 23-Jul-2019 14:15
Date Analysis Commenced : 24-Jul-2019
Issue Date : 29-Jul-2019 16:29



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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

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

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



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID		SSSD01	SSSD02	----	----	----
Client sampling date / time				23-Jul-2019 00:00	23-Jul-2019 00:00	----	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1923114-001	ES1923114-002	-----	-----	-----	-----	-----
				Result	Result	----	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)										
Moisture Content	----	0.1	%	31.8	32.9	----	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids										
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	----	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	----	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	----	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	----	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0003	0.0019	----	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	----	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids										
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	----	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	----	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	----	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	----	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	----	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	----	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	----	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	----	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	----	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	----	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	----	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides										
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	----	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	----	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SSSD01	SSSD02	----	----	----
Client sampling date / time				23-Jul-2019 00:00	23-Jul-2019 00:00	----	----	----	
Compound	CAS Number	LOR	Unit	ES1923114-001	ES1923114-002	-----	-----	-----	
				Result	Result	----	----	----	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	----	----	----	
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	----	----	----	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	----	----	----	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	----	----	----	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	----	----	----	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	----	----	----	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	----	----	----	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	----	----	----	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	----	----	----	
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg	0.0003	0.0019	----	----	----	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0003	0.0019	----	----	----	
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0003	0.0019	----	----	----	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%	62.0	64.5	----	----	----	
13C8-PFOA	----	0.0002	%	68.0	64.5	----	----	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	SWSD01	SWSD02	GWSD01	FTSD01	----
Client sampling date / time				23-Jul-2019 00:00	23-Jul-2019 00:00	23-Jul-2019 00:00	23-Jul-2019 00:00	----	
Compound	CAS Number	LOR	Unit	ES1923114-003	ES1923114-004	ES1923114-005	ES1923114-006	-----	
				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	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	----	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	----	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.02	0.05	<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	0.03	<0.02	<0.02	----	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.03	<0.02	<0.02	----	
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	----	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	----	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	----	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	----	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	----	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	----	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	----	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	----	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	----	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	----	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	----	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	SWSD01	SWSD02	GWSD01	FTSD01	----
Client sampling date / time				23-Jul-2019 00:00	23-Jul-2019 00:00	23-Jul-2019 00:00	23-Jul-2019 00:00	----	
Compound	CAS Number	LOR	Unit	ES1923114-003	ES1923114-004	ES1923114-005	ES1923114-006	-----	
				Result	Result	Result	Result	----	
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	----	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	----	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	----	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	----	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	----	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.29	<0.05	<0.05	----	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.18	<0.05	<0.05	----	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	----	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	0.02	0.58	<0.01	<0.01	----	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.02	0.05	<0.01	<0.01	----	
Sum of PFAS (WA DER List)	----	0.01	µg/L	0.02	0.58	<0.01	<0.01	----	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	108	105	102	104	----	
13C8-PFOA	----	0.02	%	107	108	110	109	----	



Surrogate Control Limits

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

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

QUALITY CONTROL REPORT

Work Order	: ES1923114	Page	: 1 of 11
Client	: GHD PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: MS EMMYLOU COOKE	Contact	: Customer Services ES
Address	: LEVEL 15, 133 CASTLEREAGH STREET SYDNEY NSW, AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 2128370	Date Samples Received	: 23-Jul-2019
Order number	: 2128370	Date Analysis Commenced	: 24-Jul-2019
C-O-C number	: ----	Issue Date	: 29-Jul-2019
Sampler	: ----		
Site	:		
Quote number	: EN/005/18		
No. of samples received	: 6		
No. of samples analysed	: 6		



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

This Quality Control Report contains the following information:

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: SOIL

				Laboratory Duplicate (DUP) Report							
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)		
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 2489299)											
ES1922994-001	Anonymous	EA055: Moisture Content	----	0.1	%	30.0	29.1	3.12	0% - 20%		
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 2488340)											
EM1911561-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit		
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit		
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit		
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit		
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit		
EM1911561-011	Anonymous	EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit		
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit		
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit		
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.0003	0.00	No Limit		
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit		
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0043	0.0048	11.3	0% - 20%		
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit		
		EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 2488340)									
		EM1911561-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
				EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9			0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit		
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1			0.0002	mg/kg	0.0002	<0.0002	0.00	No Limit		
EP231X: Perfluorononanoic acid (PFNA)	375-95-1			0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit		
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2			0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit		
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8			0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit		
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1			0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit		
EP231X: Perfluorotridecanoic acid (PFTriDA)	72629-94-8			0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit		



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 2488340) - continued									
EM1911561-001	Anonymous	EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.00	No Limit
EM1911561-011	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.00	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 2488340)									
EM1911561-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
EM1911561-011	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 2488340)									



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 2488340) - continued									
EM1911561-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
EM1911561-011	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
Sub-Matrix: WATER									
Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 2486498)									
EM1911511-014	Anonymous	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
ES1923072-004	Anonymous	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 2486498)									
EM1911511-014	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 2486498) - continued									
EM1911511-014	Anonymous	EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit
ES1923072-004	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit		
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 2486498)									
EM1911511-014	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
ES1923072-004	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 2486498)									
EM1911511-014	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
ES1923072-004	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231P: PFAS Sums (QC Lot: 2486498)									
EM1911511-014	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.00	No Limit
ES1923072-004	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.00	No Limit



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

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

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 2488340)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.6	57	121	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	72.0	55	125	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	70.0	52	126	
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	71.6	54	123	
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	68.8	55	127	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	68.4	54	125	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 2488340)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	67.7	52	128	
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	80.0	54	129	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	81.6	58	127	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	75.2	57	128	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	74.4	60	134	
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	67.2	63	130	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	73.2	55	130	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	75.6	62	130	
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	83.6	53	134	
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	74.8	49	129	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	67.3	59	129	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 2488340)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	73.2	52	132	
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	91.3	65	126	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	67.3	64	126	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	92.9	63	124	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	75.8	58	125	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	73.6	61	130	
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	73.6	55	130	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 2488340)									
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	75.6	54	130	
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	70.0	61	130	
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	75.6	62	130	



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
Method: Compound	CAS Number	LOR	Unit		Result	Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 2488340) - 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	60	130	

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
Method: Compound	CAS Number	LOR	Unit		Result	Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 2486498)									
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.5 µg/L	80.6	70	130	
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.5 µg/L	76.8	70	130	
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.5 µg/L	78.4	70	130	
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.5 µg/L	83.2	70	130	
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.5 µg/L	79.6	70	130	
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.5 µg/L	83.6	70	130	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 2486498)									
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	2.5 µg/L	79.4	70	130	
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.5 µg/L	89.8	70	130	
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.5 µg/L	86.8	70	130	
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.5 µg/L	88.2	70	130	
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.5 µg/L	87.2	70	130	
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.5 µg/L	86.4	70	130	
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.5 µg/L	92.4	70	130	
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.5 µg/L	88.6	70	130	
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.5 µg/L	87.8	70	130	
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.5 µg/L	81.4	70	130	
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	1.25 µg/L	93.4	70	150	
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 2486498)									
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.5 µg/L	80.6	70	130	
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	1.25 µg/L	92.3	70	150	
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	1.25 µg/L	83.6	70	150	
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	1.25 µg/L	92.4	70	150	
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	1.25 µg/L	93.7	70	150	
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.5 µg/L	96.6	70	130	
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.5 µg/L	95.0	70	130	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 2486498)									
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.5 µg/L	81.0	70	130	
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.5 µg/L	86.4	70	130	



Sub-Matrix: WATER

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report				
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 2486498) - continued									
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.5 µg/L	86.0	70	130	
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.5 µg/L	91.8	70	130	

Matrix Spike (MS) Report

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

Sub-Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery (%) MS	Recovery Limits (%) Low High	
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 2488340)							
EM1911561-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	94.0	50	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	76.0	50	130
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	71.6	50	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	78.0	50	130
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	78.8	50	130
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	70.0	50	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 2488340)							
EM1911561-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	55.2	30	130
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	76.8	50	130
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	91.2	50	130
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	83.2	50	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	82.8	50	130
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	81.6	50	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	86.4	50	130
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	91.6	50	130
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	97.6	50	130
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	89.6	30	130
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	70.0	30	130
		EP231C: Perfluoroalkyl Sulfonamides (QCLot: 2488340)					
EM1911561-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	85.2	50	130
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	79.2	30	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	72.8	30	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	81.4	30	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	72.8	30	130



Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 2488340) - continued							
EM1911561-001	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	90.0	30	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	84.8	30	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 2488340)							
EM1911561-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	75.2	50	130
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	78.8	50	130
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	95.2	50	130
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	108	50	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 2486498)							
EM1911511-014	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.5 µg/L	85.4	50	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.5 µg/L	92.4	50	130
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.5 µg/L	88.0	50	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.5 µg/L	91.2	50	130
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.5 µg/L	87.0	50	130
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.5 µg/L	81.8	50	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 2486498)							
EM1911511-014	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	2.5 µg/L	88.8	50	130
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.5 µg/L	99.0	50	130
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.5 µg/L	101	50	130
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.5 µg/L	98.4	50	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.5 µg/L	99.8	50	130
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.5 µg/L	95.8	50	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.5 µg/L	98.4	50	130
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.5 µg/L	94.6	50	130
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.5 µg/L	100	50	130
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.5 µg/L	96.0	50	130
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	1.25 µg/L	101	50	150
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 2486498)							
EM1911511-014	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.5 µg/L	96.8	50	130
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	1.25 µg/L	101	50	150
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	1.25 µg/L	99.1	50	150
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	1.25 µg/L	105	50	150



Sub-Matrix: **WATER**

				<i>Matrix Spike (MS) Report</i>			
				<i>Spike</i>	<i>SpikeRecovery(%)</i>	<i>Recovery Limits (%)</i>	
<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Method: Compound</i>	<i>CAS Number</i>	<i>Concentration</i>	<i>MS</i>	<i>Low</i>	<i>High</i>
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 2486498) - continued							
EM1911511-014	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	1.25 µg/L	98.2	50	150
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.5 µg/L	92.6	50	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.5 µg/L	105	50	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 2486498)							
EM1911511-014	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.5 µg/L	89.8	50	130
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.5 µg/L	95.4	50	130
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.5 µg/L	102	50	130
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.5 µg/L	102	50	130



QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES1923114	Page	: 1 of 5
Client	: GHD PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: MS EMMYLOU COOKE	Telephone	: +61-2-8784 8555
Project	: 2128370	Date Samples Received	: 23-Jul-2019
Site	:	Issue Date	: 29-Jul-2019
Sampler	: ----	No. of samples received	: 6
Order number	: 2128370	No. of samples analysed	: 6

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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



Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

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

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055) SSSD01, SSSD02	23-Jul-2019	----	----	----	25-Jul-2019	06-Aug-2019	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X) SSSD01, SSSD02	23-Jul-2019	25-Jul-2019	19-Jan-2020	✓	26-Jul-2019	03-Sep-2019	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X) SSSD01, SSSD02	23-Jul-2019	25-Jul-2019	19-Jan-2020	✓	26-Jul-2019	03-Sep-2019	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X) SSSD01, SSSD02	23-Jul-2019	25-Jul-2019	19-Jan-2020	✓	26-Jul-2019	03-Sep-2019	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X) SSSD01, SSSD02	23-Jul-2019	25-Jul-2019	19-Jan-2020	✓	26-Jul-2019	03-Sep-2019	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X) SSSD01, SSSD02	23-Jul-2019	25-Jul-2019	19-Jan-2020	✓	26-Jul-2019	03-Sep-2019	✓

Matrix: **WATER**

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

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X) SWSD01, GWSD01, SWSD02, FTSD01	23-Jul-2019	24-Jul-2019	19-Jan-2020	✓	26-Jul-2019	19-Jan-2020	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X) SWSD01, GWSD01, SWSD02, FTSD01	23-Jul-2019	24-Jul-2019	19-Jan-2020	✓	26-Jul-2019	19-Jan-2020	✓



Matrix: **WATER**

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

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) SWSD01, GWSD01, SWSD02, FTSD01	23-Jul-2019	24-Jul-2019	19-Jan-2020	✓	26-Jul-2019	19-Jan-2020	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) SWSD01, GWSD01, SWSD02, FTSD01	23-Jul-2019	24-Jul-2019	19-Jan-2020	✓	26-Jul-2019	19-Jan-2020	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) SWSD01, GWSD01, SWSD02, FTSD01	23-Jul-2019	24-Jul-2019	19-Jan-2020	✓	26-Jul-2019	19-Jan-2020	✓



Quality Control Parameter Frequency Compliance

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

Matrix: SOIL

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

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Moisture Content	EA055	1	10	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard

Matrix: WATER

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

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	18	11.11	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-House. A portion of soil is extracted with MTBE. The extract is taken to dryness, made up in mobile phase. Analysis is by LC/MSMS, ESI Negative Mode using MRM. Where commercially available, isotopically labelled analogues of the target analytes are used as internal standards for quantification. Where a labelled analogue is not commercially available, the internal standard with similar chemistry and the closest retention time to the target is used for quantification. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. This method complies with the quality control definitions as stated in QSM 5.1. Data is reviewed in line with the DQOs as stated in QSM5.1
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In house: Direct injection analysis of fresh waters after dilution (1:1) with methanol. Analysis by LC-Electrospray-MS-MS, Negative Mode using MRM. Where commercially available, isotopically labelled analogues of the target analytes are used as internal standards for quantification. Where a labelled analogue is not commercially available, the internal standard with similar chemistry and the closest retention time to the target is used for quantification. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. This method complies with the quality control definitions as stated in QSM 5.1. Data is reviewed in line with the DQOs as stated in QSM5.1
Preparation Methods	Method	Matrix	Method Descriptions
Sample Extraction for PFAS	EP231-PR	SOIL	In house
Preparation for PFAS in water.	EP231-PR	WATER	Method presumes direct injection without workup. Preparation includes addition of internal standard and surrogate, and filtration prior to analysis.

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