MFS Angle Park Facilities

Detailed Site Investigation

South Australian Metropolitan Fire Service

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→ The Power of Commitment

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Acknowledgement of Country

GHD acknowledges Aboriginal and Torres Strait Islander peoples as the Traditional Custodians of the land, water and sky throughout Australia on which we do business. We recognise their strength, diversity, resilience and deep connections to Country. We pay our respects to Elders of the past, present and future, as they hold the memories, knowledges and spirit of Australia. GHD is committed to learning from Aboriginal and Torres Strait Islander peoples in the work we do.

Executive Summary

GHD Pty Ltd (GHD) was engaged by the South Australian (SA) Metropolitan Fire Service (MFS) to undertake a Detailed Site Investigation (DSI) for the Angle Park Facilities, located at 456 Grand Junction Road, Angle Park South Australia 5010 (the site). The site comprises the MFS Fire Station, MFS Training Centre and Engineering Workshop, Urban Search and Rescue, South Australia Power Networks (SAPN) facilities and training areas. The DSI is limited to potential impacts from the use of aqueous film-forming foams (AFFF) containing per- and poly-fluoroalkyl substances (PFAS) to address the action required by the South Australian Environment Protection Authority (EPA) letter GENI 62917 (refer to Appendix A).

In accordance with the EPA's requirements and the Sampling Analysis and Quality Plan (SAQP) (GHD 2023b), the objectives and scope of this investigation were as follows:

– Assess the nature and extent of PFAS contamination in soils and groundwater, both on- and off-site
– Assess the potential risks to human health and the environment associated with identified PFAS contamination on-site in the context of continued commercial/industrial site use and relevant off-site land uses and environments
– Provide recommendations for further works (if required), and mitigation measures should any identified contamination require immediate action

The following scope of work was undertaken to meet the above objectives:

– Advancement of twelve soil bores and 19 test pits across the site and associated soil sampling and analysis
– Installation, development, survey and sampling of five groundwater monitoring wells,
– One sediment sample from an adjacent stormwater diversion channel and two surface soil samples within the South Australia Power Networks (SAPN) training area
– Refinement of the Conceptual Site Model (CSM) and a preliminary assessment of potential human health and ecological risks

The results presented in this report identified contamination in both soil and groundwater at the site, which is associated with historical training using AFFF and the flushing of appliances that contained AFFF. The highest impacts were observed in groundwater from monitoring well MW05, located in the rear yard of the MFS Fire Station. Exceedances of relevant human health and ecological guidelines were identified in groundwater at the site, with further exceedances of ecological guidelines identified in soil at the site.

The following recommendations have been made:

– Additional monitoring wells should be installed on- and off-site to delineate the extent of PFAS contamination within groundwater
– Further, on-site sampling of contaminated soil may be needed to delineate the extent of PFAS contamination and its potential associated ecological risk
– Given the presence of soils exceeding the adopted ecological criteria and the potential for secondary consumers (birds, snakes, etc.), it is recommended that an assessment of the site's ecological significance (sensitive species and foraging habitat) be undertaken to determine the potential presence of receptors that the identified PFAS contamination may adversely impact
– Further assessment of the stormwater, diversion channel, and receiving surface water bodies is needed to determine the potential for PFAS impacts on sediments and surface waters

This report is subject to and must be read in conjunction with the limitations set out in section 1.6 and the assumptions and qualifications contained throughout the report.

Table of abbreviations

Abbreviation	Full Form
AFAC	Australasian Fire and Emergency Service Authorities Council
AFFF	Aqueous Film-Forming Foam
AHD	Australian Height Datum
CoC	Contaminant of Concern
CSM	Conceptual Site Model
DQIs	Data Quality Indicators
DQOs	Data Quality Objectives
GAR	South Australian *Guidelines for the Assessment and Remediation of Site Contamination 2019*
GHD	GHD Pty Ltd
HEPA	Heads of Environment Protection Authorities Australia
HDPE	High-Density Polyethylene
HIL	Human Health Investigation Level
LNAPL	Light Non-Aqueous Phase Liquid
LOR	Limit of Reporting
m bgl	Metres Below Ground Level
MFS	South Australian Metropolitan Fire Service
mg/L	Milligrams /Litre
MW	Monitoring Well
NATA	National Association of Testing Authorities
NEMP	PFAS National Environmental Management Plan Version 2.0 - January 2020
NEPC	National Environmental Protection Council
NHMRC	National Health and Medical Research Council
PFAS	Per- and Poly-Fluoroalkyl Substances
PFHxS	Perfluorohexane Sulfonate
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctane Sulfonate
PFPeA	Perfluoropentanoic acid
PVC	Polyvinyl Chloride
QA/QC	Quality Assurance and Quality Control
RPD	Relative Percentage Difference
SA EPA	South Australian Environment Protection Authority
SAQP	Sampling and Analysis Quality Plan
SPR	Source-Pathway-Receptor
SWL	Standing Water Level
TDS	Total Dissolved Solids

Abbreviation	Full Form
TOC	Top of Casing
WQEPP	South Australian *Environmental Protection (Water Quality) Policy* 2015
µg/L	Micrograms /litre
µS/cm	Microsiemens /centimetre

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1. Introduction

GHD Pty Ltd (GHD) was engaged by the South Australian (SA) Metropolitan Fire Service (MFS) to undertake a Detailed Site Investigation (DSI) for the Angle Park Station, located at 456 Grand Junction Road, Angle Park South Australia 5010 (the site).

The DSI is limited to potential impacts from the use of aqueous film-forming foams (AFFF) containing per- and poly-fluoroalkyl substances (PFAS) to address the action required by the SA Environment Protection Authority (EPA) letter GENI 62917 (refer to Appendix A).

1.1 Background

The Angle Park Facilities comprise the Fire Station, Training Centre and Engineering Workshop. The Fire Station has been functional since 1989 and is currently staffed by full-time firefighters who provide 24-hour emergency response throughout the year. The Training Centre was commissioned in 2001 and currently has 33 staff and up to 24 recruits. The Engineering Workshop was opened in 2007 and currently has ten staff.

Historically, MFS has used AFFF containing PFAS at the site during training activities. It is understood that MFS commenced phasing out the use of firefighting foams containing perfluorooctane sulfonate (PFOS) in 2007 and perfluorooctanoic acid (PFOA) in 2014 after consultation with the Australasian Fire and Emergency Service Authorities Council (AFAC) and the SA EPA. MFS replaced all firefighting foam in 2016 to ensure that only products designated fluorine-free were in use. During 2017/2018, MFS removed all fire extinguishers containing PFAS from their inventory.

In 2022, GHD undertook a site history review of 17 MFS sites (GHD 2022) and inspections of eight metropolitan sites to support environmental risk profiling using a multi-criteria analysis approach. The work was required to address the potential risks associated with the former use of AFFF containing PFAS. The sites were prioritised to assist with implementing appropriate assessment and management measures to address the potential PFAS risks. The GHD 2022 Report was provided to the SA EPA, who subsequently issued a letter dated 1 February 2023 (EPA GENI 62917) with the requirement of “a plan of proposed works and associated timelines to address the highest risk sites” (refer Appendix A).

In 2023, GHD completed a Preliminary Site Investigation (PSI) (GHD 2023a) and Sampling Analysis and Quality Plan (SAQP) (GHD 2023b) for the site. This DSI was prepared to address the data gaps identified in the PSI, and the scope of work was undertaken per the SAQP.

1.2 Objectives

Per the SA EPA requirements, the objectives of this investigation were to:

– Assess the nature and extent of PFAS contamination in soils and groundwater, both on- and off-site
– Assess the potential risks to human health and the environment associated with identified PFAS contamination on-site in the context of continued commercial/industrial use
– Assess the potential risks to human health and the environment associated with PFAS contamination migrating off-site in the context of the relevant off-site land uses and environments
– Provide recommendations to mitigate the potential impacts arising from identified residual source zones

1.3 Scope of Works

The following scope of works was undertaken in general accordance with the SAQP (GHD 2023b):

– Collection of two surface soil samples within the SAPN training area,
– Collection of one sediment sample from the adjacent storm water drain, running along the western boundary,
– Advancement of eight bores in areas with hardstand,
– Excavation of 19 test-pits in an approximate grid across remaining areas of the site as well as in locations targeting known areas of historical AFFF use,

– Installation and development of five groundwater monitoring wells,
– Surveying of the newly installed groundwater monitoring wells relative to the Australian Height Datum (AHD),
– Disposal of waste soil and groundwater by a licenced contractor,
– Development of a Conceptual Site Model (CSM) comprising an assessment of PFAS source areas, pathways, and receptors,
– Preparation of this DSI

1.4 Limitations

This report: has been prepared by GHD for South Australian Metropolitan Fire Service and may only be used and relied on by South Australian Metropolitan Fire Service for the purpose agreed between GHD and South Australian Metropolitan Fire Service as set out in section 1.3 of this report.

GHD otherwise disclaims responsibility to any person other than South Australian Metropolitan Fire Service 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.

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.

GHD has prepared this report on the basis of information provided by South Australian Metropolitan Fire Service and others who provided information to GHD (including Government authorities)], which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report (refer section(s) 1.6 of this report). GHD disclaims liability arising from any of the assumptions being incorrect.

Accessibility of documents

If this report is required to be accessible in any other format, this can be provided by GHD upon request and at an additional cost if necessary.

1.5 Assumptions

The assessment, conclusions and recommendations outlined in this report are based on the following assumptions:

– No fruit, vegetables or herbs are grown on-site for consumptive purposes
– The term PFAS refers to a large number of perfluorinated and polyfluorinated substances. The primary analytical suite adopted for this assessment incorporated 28 compounds, including PFOS, PFHxS and PFOA, which are the primary focus of this report
– The screening levels used in this Report were consistent with the guidance provided by Australian regulators at the time of reporting

2. Site information

2.1 Site identification

Site information details are summarised in Table 2.1. A site location plan is shown in Figure 1.

Table 2.1 Summary of General Site Identification Information

Item	Detail
:	456 Grand Junction Road, Angle Park, SA 5010
Certificate of Title:	CT 5104/576 CT 6005/338
Legal Description:	Filed Plan 28828 in the Area named Angle Park, Hundred of Yatala Deposited Plan 72468 in the Area named Angle Park, Hundred of Yatala
Local Government Authority:	City of Port Adelaide Enfield
Current Zoning:	Employment /Strategic Employment
Property Owner:	South Australian Metropolitan Fire Service
Current Site Use:	Operational Fire Station
Area:	153,034 m^2
Site Elevation:	10 m AHD

2.2 Site description

2.2.1 Site inspection and description

The site is situated in the suburb of Angle Park, located approximately 13 km northwest of the Adelaide city centre. The North-South Motorway is located approximately 370 m west of the site, and Grand Junction Road borders it to the north and Angle Road to the south. A site inspection was conducted by GHD staff on 12 October 2023. During the inspection, the Angle Park Facilities encompassed three MFS facilities: the Fire Station, the Engineering Workshop and the Angle Park Training Centre. Additionally, areas of the site are used by SA Urban Search and Rescue (part of MFS) (east) and an area owned or leased by SA Power Networks (south).

The Fire Station's infrastructure consisted of the northern portion's main building, a paved backyard, and a shed along the southern boundary. A paved driveway along the eastern station boundary was present, allowing vehicle access from Grand Junction Road to the backyard. The western side of the backyard was used as a car park, while the central area was used for recreation, training and washdown purposes. The Engineering Workshop used a shed for appliances, and it was historically used to store foam concentrate in 20 L plastic containers at the western end of the shed. A front garden and a narrow strip of vegetation ran along the west boundary. A stormwater diversion channel was adjacent to the western boundary off-site, which ran north to south.

Infrastructure across the remainder of the site comprised an engineering workshop building, sheds and sealed yards in the northern portion of the site, and the Urban Search and Rescue building, sealed car parks and two smaller buildings in the northeastern part of the site. SA Power Networks and MFS training facilities, including buildings, sheds and sealed car parks/yards, were present in the site's southern portion.

The central area of the facilities was a large, unsealed area covered in tall grass used for fire training activities. The eastern portion of this area was used for grass fire training, often ignited using petrol. Soil stockpiles were present in this area, generated from landscaping activities at the site but not from any identified fire training areas. Historically, infrequent fire training occurred in the site's centre, although AFFF was unlikely to have been used. A large number of wrecked cars were present in the central area and were used for training activities. Construction debris (concrete and metal) was present throughout the unsealed central area of the site. Vegetation, such as trees and shrubs, lined the southern and western boundary. There were also a small number of trees around the access road between the Fire Station and the unsealed training area in the central Facilities area.

Photographs from the site inspection are presented in Appendix B. A site layout plan is shown in Figure 3.

2.2.2 Historical use and storage of PFAS

A questionnaire regarding the historical use of AFFF at the site was circulated to MFS staff. The two surveys were completed on 21 June 2022 by a Station Officer who had been working at the site for several years and provided relevant historical, anecdotal information in an interview during the site inspection. The completed surveys can be viewed in the PSI (GHD 2023a).

Historically, foam training exercises using AFFF were conducted at the Fire Station once or twice a year by each of the four shifts (equating to approximately eight training events per annum). Foam training was primarily conducted in an open area south-east of the Engineering Workshop and the gravel area south of the Urban Search and Rescue buildings. The volume of AFFF used per training exercise was estimated to be between 1 - 2 L, which is just enough to create a decent foam blanket. The AFFF was generally dispersed aerially over approximately 50% of the training area during the training exercises. Foam and wastewater from the training events were allowed to soak into the ground or discharged off-site as stormwater.

According to a staff survey completed during a site inspection on 21 June 2022, AFFF was not used at the Angle Park Training Centre for recruit training. Instead, surplus protein foam or training foam was used, and neither contained AFFF.

Following incidents involving AFFF use, appliances were washed down /flushed in the southern portion of the Fire Station area (rear yard), with water collected into stormwater drains on-site, before discharging into the stormwater diversion channel off-site. It is noted that washing appliances and equipment is not considered a risk of releasing AFFF. However, flushing of the AFFF system on the appliance and any equipment would likely have resulted in the release of AFFF.

2.3 Surrounding land use

Land use surrounding the site is summarised in Table 2.2. Surrounding land uses and zoning are shown in Figure 2.

Table 2.2 Land Uses and Zoning

Orientation	Description of Land Use	Zoning (Municipal Council)
North	Various commercial properties are located immediately north of the site across from Grand Junction Road, including a kitchen re-modeller (CAA Kitchens), wire fencing store (ANP Metals Wire), kitchen supply store (Good Value Kitchens), cleaning product supplier (Spitwater SA) and auto broker (American Motors SA). Residential properties are to be found amongst the commercial retailers.	Employment /Home Industry
East	A storage and distribution warehouse (SAPN) is located immediately east of the site, and a fabrication engineering company (TEKS Engineering) is situated further east. Industrial activities are noted to the east of the Training Centre.	Strategic Employment /Employment
South	An aged care facility (Linsell Lodge) is located south of the SA Power Networks training area across from Angle Road. A parcel of land designated for recreational use is situated south of MFS Angle Park Training Centre off Angle Road. Various residential properties are also located south of the site.	General Neighbourhood
West	Land use to the west of the site is primarily residential, with a parcel of vacant land identified on the property's western boundary. A transportation service company (Smith Haulage) is adjacent to Angle Park Facilities on the west. Further west of the station is a fuel station and convenience store (Shell Coles Express).	General Neighbourhood /Employment

3. Previous reports

GHD has conducted previous investigations at the Angle Park Station in 2019, 2022, and 2023. Documentation of these investigations can be found in the following reports:

– GHD (2019) *MFS State-wide Appliance and Station Sampling*, Report for South Australian Metropolitan Fire Service, May 2019
– GHD (2022) *MFS 17 Fire Stations PFA Risk Profiling*, Report for South Australian Metropolitan Fire Service, October 2022
– GHD (2023a) *MFS Angle Park Facilities, Preliminary Site Investigation*, Report for South Australian Fire Service, July 2023
– GHD (2023b) *MFS Angle Park Facilities, Sampling and Analysis Quality Plan*, Report for South Australian Fire Service, September 2023

Historical sampling locations at the Angle Park Fire Station as part of the abovementioned investigations are presented in Figure 4. A summary of the investigations undertaken at the site to date is detailed below.

3.1 GHD (2019) MFS State-wide Appliance and Station Sampling

In 2019, environmental investigations were carried out at 35 fire stations across South Australia to assess residual PFAS levels in firefighting appliances, soil and any biota (fruit, vegetables, herbs and poultry). The Angle Park MFS facilities formed part of MFS state-wide appliance and station sampling sites. Four soil samples were collected during the sampling program at Angle Park MFS facilities. Two samples were collected directly adjacent to the Fire Station building (east and west), and two samples were collected southeast of the engineering workshop where AFFF had historically been used as part of fire training exercises (shown in Figure 4). The assessment criteria used during this investigation were only protective of human health, with no ecological criteria used. Laboratory analyses of samples collected from the Angle Park MFS facilities reported the following:

– Two soil samples (ANGLE_1 and ANGLE_2), collected from the eastern and western sides of the MFS Fire Station building, were under exceedance levels, although contamination in the soil was present, with the PFAS (Sum of total) being 0.74 and 0.7 mg/kg
– Two soil samples (TRAIN_1 and TRAIN_2), collected from an area in which AFFF had previously been sprayed as part of training exercises, were under exceedance levels, with TRAIN_2 reporting the higher PFAS (Sum of total) at 0.51 mg/kg. In contrast, TRAIN_1 reported 0.0078 mg/kg

The following were not investigated:

– Surface Water
– Groundwater
– Concrete/Bitumen/Pavement

It is noted that the 2018 PFAS NEMP guidelines were used in this report, which were superseded by the 2020 PFAS NEMP 2.0. However, this has no practical impact on the purposes of this report, as the guideline values for soil at commercial/industrial properties are the same in both versions of the PFAS NEMP. In the 2020 PFAS NEMP 2.0, environmental guidelines values that refer to the sum of PFOS and perfluorohexane sulfonate (PFHxS) now explicitly apply not only to the sum of the two but also to PFOS only and to PFHxS only, which was only inferred in the 2018 PFAS NEMP 1.0.

3.2 GHD (2022) MFS 17 Fire Stations PFAS Risk Profiling

The Angle Park MFS Fire Station formed part of the 2022 desktop assessment, and multi-criteria analysis (MCA) carried out at 17 MFS fire stations across South Australia to support appropriate risk management approaches associated with identified PFAS contamination. The SA EPA identified the 17 sites required for prioritisation, including Angle Park, in the letter GENI 62485 dated 21 October 2021.

The report presented the methodology and findings of the PFAS risk profiling for the 17 MFS fire stations with identified PFAS impacts in soil. The desktop review focused on identifying historical activities that may represent a source of PFAS contamination and potentially sensitive human or ecological receptors in the vicinity of the sites and understanding potential source-pathway-receptor linkages that may be present.

The report provided a summary of the sites' prioritisation for further assessment based on their potential to cause harm to the environment and human health. The Angle Park MFS Fire Station was classified as high risk with high priority for further investigation of PFAS contamination for the following reasons:

– Groundwater is used for domestic purposes within 2.0 km of the site,
– Open storm water drain within 0.5 km of the site,
– The high infiltration potential on a site which is predominantly unsealed,
– There is residential land use adjacent to the station and training centre,
– A moderate level of stakeholder engagement will be required based on the perceived levels of stakeholder sensitivity,
– A relatively large quantity of AFFF concentrate was stored across the fire station, engineering workshop, and training area

Furthermore, it is noted that minimal information is available on historical AFFF use and storage at the Engineering Workshop. Further investigation of the Angle Park facilities is required to confirm anecdotal information related to additional potential sources of PFAS contamination.

3.3 GHD (2023a) MFS Angle Park Facilities, Preliminary Site Investigation

A preliminary site investigation was undertaken to review historical site activities that may have contributed to PFAS contamination at the site and potentially off-site. The preliminary site investigation included the following scope of work:

– Desktop assessment of site history and historical activities which may have contributed to PFAS contamination of the site and surrounds,
– Review of available information regarding local geology, hydrogeology and environmental setting,
– A site inspection and interviews with site personnel to confirm features and historical PFAS use areas documented in the desktop review,
– Development of a preliminary CSM comprising an assessment of PFAS source areas, pathways and receptors.

The potential risks to human health and the environment outlined in the preliminary CSM were as follows:

– Exposure of site users, visitors, maintenance and construction workers to PFAS via direct dermal contact with contaminated soil, incidental ingestion of contaminated soil or inhalation of contaminated soil/dust from disturbed soils,
– Exposure of terrestrial fauna and flora to PFAS via direct contact with contaminated soil, ingestion of contaminated soil or bioaccumulation through the food chain (indirect contact),
– Leaching of PFAS from contaminated soils or concrete/bitumen surfaces followed by migration through porous media into groundwater,
– Consumption of contaminated groundwater extracted off-site for domestic /drinking purposes,

– Consumption of fruit and vegetables grown off-site where plants come into contact with contaminated soil, irrigated with contaminated groundwater, or where plant roots accessed shallow contaminated groundwater. It should be noted that no edible vegetation is present at the site,
– Incidental ingestion of contaminated groundwater extracted off-site for recreational purposes such as filling of swimming pools,
– Discharge of stormwater runoff into freshwater and, ultimately, marine ecosystems (Barker Inlet Wetlands) and exposure to aquatic life

The outcomes of these works are incorporated in the applicable sections of this report.

3.4 GHD (2023b) MFS Angle Park, Sampling Analysis and Quality Plan

Following confirmation of potentially contaminating activities as part of the PSI, a Sampling Analysis and Quality Plan (SAQP) was prepared. Presented in the SAQP were the scope of work, methodologies, and sampling rationale to be utilised during the intrusive investigations as part of this DSI.

The SAQP was based upon the preliminary CSM provided in the PSI, with the following data gaps being identified, which were required to meet the investigation objectives.

– The lateral and vertical extent of PFAS contamination in soil has not been delineated,
– The lateral and vertical extent of PFAS contamination in groundwater has not been determined,
– The degree of PFAS contamination in on-site concrete and bitumen surfaces and the associated PFAS flux from these materials has not been assessed,
– The potential for PFAS to leach from contaminated soil into groundwater has not been tested yet

4. Environmental setting

4.1 Topography and hydrology

The topography of the site and surrounding land is uniformly flat and forms part of the Adelaide Plains, between Gulf St Vincent to the west and the Mount Lofty Ranges to the east. The site sits at an elevation of approximately 10 m AHD. The site itself is equally uniform, with only marginal changes in gradient across the property. An open storm water channel runs along the western boundary of the site.

The Engineering Workshop is mostly sealed with asphalt or concrete hardstands. Similarly, the SA Urban Search and Rescue area to the east and the Angle Park Training Centre and sub-station in the south are also mostly sealed with asphalt or concrete hardstands. Surface runoff in the sealed areas of the site is likely to be managed via discharge to the off-site stormwater drain to the west of the site.

The central area of the site is primarily unsealed bare ground, with some access roads and paths throughout. Surface runoff in the central portion of the site is likely to soak into the bare ground, with excess runoff directed by surficial topography.

4.2 Site drainage

The Fire Station's topography gradually slopes north towards Grand Junction Road. The vast majority of the Fire Station is sealed with brick pavers. Three stormwater drains are in the southern rear yard, with stormwater collected in a sump before off-site discharge to a nearby stormwater drain.

The topography of the Training Centre, Engineering Workshop and associated southern unsealed land is relatively flat, slightly sloping towards the north and western boundaries. An open stormwater drain is present along the western boundary of the site. Stormwater was reported to flow either towards Grand Junction Road to the north or the open drainage channel to the west. Stormwater not directed into drains was generally left to soak into the ground. No changes to the stormwater management system have been reported, nor has stormwater been harvested at the site.

4.3 Surface water

The nearest surface water bodies from the site are a stormwater diversion channel that runs north to south, adjacent to the western boundary. The stormwater diversion channel feeds into the Barker Inlet Wetlands 1.7 km to the northeast, which form part of a series of constructed wetlands that includes the Greenfields and Connector Wetlands at Salisbury and the Range and Magazine Creek Wetlands at Gillman (Gov SA 2023a). Stormwater enters the wetlands at several points and then flows through a series of lagoons before discharging through a sea wall and into the mangrove estuary of North Arm Creek.

4.4 Geology

The geology at the site was consistent with the geology described in the PSI (GHD 2023a) report, which indicated that the site is characterised by Chromosol soils, which are distinguished by outwash plains with hard alkaline red soils, small areas of cracking clay soils and various alluvial soils in the stream valleys consisting of smectite-rich clay and rare sand lenses.

The site lies within a region of extremely low (1 - 5%) probability of potential acid sulphate soil (PASS) occurrence.

The surface geology unit of the site is classified as Pooraka Formation, with origins from the Pleistocene. This formation is typified by clay, sand and carbonate earth with gravel lenses (GHD 2023a).

The geology encountered on-site during the intrusive investigations was consistent with the regional geology. Generally, the first natural layer encountered during the excavation of the boreholes comprised of low plasticity, brown to red-brown sandy clays consistent with the Pooraka Formation, at depths between 0.4 - 4.0 m bgl. This was underlain with high plasticity, silty Hindmarsh clays that appeared grey.

4.5 Hydrogeology

According to the Department of Water, Land and Biodiversity Conservation (DWLBC) Report (Gerges 2006), the site lies within the main hydrogeological 'Zone 3', which contains five to six Quaternary aquifers and also three to four almost flat-lying, Tertiary aquifers. The first and second Tertiary aquifers are the thickest and the most productive, with relatively low salinity. The most significant proportion of abstracted groundwater for industrial and recreational use comes from the first Tertiary aquifer (Gerges 2006). According to Gerges (2006), this aquifer exhibits numerous cones of drawdown coinciding with known pumping centres, which culminates in further subdivision of the aquifer. Consequently, the site is allocated to 'Subzone 3B' (Penrice). These confining beds between the fifth and sixth aquifers are absent in Subzone 3B, allowing hydraulic connection between aquifers (Gerges 2006). The general groundwater flow in the area is in a north westerly direction.

A search of the South Australian Resources Information Gateway (SARIG) database reported shallow groundwater near the site with standing water levels (SWL) of 2 - 5 m bgl, producing yields of 0.5-2.5 L/second. Groundwater salinity ranges from 14,000 - 35,000 mg/L total dissolved solids (TDS), indicating saline to highly saline water.

4.6 Local Groundwater Users (WaterConnect Database)

A search of the SA WaterConnect database (February 2024) for registered groundwater wells located within a 2.0 km radius of the site was undertaken as part of this investigation. The results are summarised as follows:

- There were 393 registered wells within a 2.0 km radius
- Of these registered wells, 23 were listed as backfilled, 16 as operational, 15 as unknown, 13 as dry, 11 as abandoned, one as rehabilitated, one as not in use, one as geotechnically equipped and 312 had no listed status
- Of the 16 registered operational wells, three were listed as having domestic purposes, five as drainage, three as observational, two as irrigation, one as drainage and observational, one as industrial and one as recreational
- Of the 327 wells with unknown or no registered status, 163 were listed for investigation purposes, 31 for environmental, 30 for observation, 23 for monitoring, 16 for domestic, 4 for drainage, 1 for industrial and 59 had no listed purpose
- TDS data were recorded for 16 wells within the 2.0 km radius of the site and ranged between 471 mg/L and 76,000 mg/L. The four closest wells (<0.7 km) with TDS data under 30 years old ranged between 1,984 mg/L and 76,000 mg/L, indicating slightly saline to highly saline water

The SA WaterConnect database search results can be found in Appendix C.

5. Assessment criteria

The CoC in this investigation was limited to PFAS. As such, assessment criteria from the following documents were adopted:

– HEPA 2020, PFAS National Environmental Management Plan (Version 2.0), Heads of Environment Protection Authorities Australia and New Zealand, January 2020, (PFAS NEMP)
– NHMRC 2011, Australian Drinking Water Guidelines 6 (ADWG), Version 3.7, National Water Quality Management Strategy, National Health and Medical Research Council and Natural Resources Management Ministerial Council, Commonwealth of Australia, updated September 2022
– GHD 2023, Derivation of Site-specific Health Investigation Levels for Urban and Regional Fire Stations – South Australian Metropolitan Fire Service (MFS), June 2023

5.1 Soil

In accordance with the PFAS NEMP 2020, the PFAS assessment criteria listed in Table 5.1 have been adopted to assess soil samples.

The typical usage patterns at MFS fire stations align with the exposure assumptions underpinning HIL D (Industrial/Commercial) values. The following inconsistencies are, however, noted:

– The preliminary site investigations undertaken at MFS sites across South Australia have identified that some fire stations have a higher proportion of unsealed ground (up to approximately 75% of the total site area) than has been assumed in the derivation of the HIL D values (up to approximately 20% of the total site area). As a result, there may be more significant opportunities for direct access to soil at MFS fire stations, including ingesting soil and soil-derived dust
– The shifts worked by MFS firefighters do not align with the assumption of a standard working week that underpins the HIL D values

Given these factors, Site-specific Health Investigation Levels (SSHILs) have been derived using exposure assumptions that reflect the typical usage pattern of MFS fire stations to allow for tailored assessment of the potential exposure risks associated with PFAS in shallow soils. Further discussion regarding the development of the SSHILs is provided in Section 5.1.1.

Table 5.1 Adopted PFAS Assessment Criteria – Soil

Exposure Scenario	PFHxS[1]	PFOS[2]	Sum of PFHxS and PFOS	PFOA[3]	Principle Reference Document
Human Health Investigation Levels (HIL) mg/kg					
HIL-B residential with limited soil contact	2	2	2	20	PFAS NEMP (HEPA 2020)
Site-specific HILs[4] for the screening of PFAS-contaminated soils at MFS sites (Metropolitan, Staffed)	-	-	14	50	Derivation of site-specific health investigation levels for urban and regional fire stations (GHD, June 2023)
Ecological Screening Levels					
Ecological indirect exposure – Undeveloped sites – Developed sites	-	0.01 0.14	-	-	PFAS NEMP (HEPA 2020)
Ecological direct exposure	-	1	-	10	

Notes:
[1] PFHxS – perfluorohexane sulfonate
[2] PFOS – perfluorooctane sulfonate
[3] PFOA – perfluorooctanoic acid
[4] Discussed further in section 5.1.1.

5.1.1 Human health soil guideline values

GHD letter report, *Derivation of site-specific Health Investigation Levels (HILs) for urban and regional fire stations* (GHD, July 2023), outlines site-specific HILs (SSHILs) for the two types of MFS fire stations:

– Urban/metropolitan (also referred to as “staffed”)
– Regional (also referred to as “retained”)

The methodology and associated exposure assessment processes are outlined in Appendix E. The SSHILs will be used in place of the generic HIL D (commercial/industrial) guidelines from the PFAS NEMP 2.0 for preliminary screening of potential human health exposure risks for MFS sites.

Additionally, GHD understands that MFS, in consultation with the United Fire Fighters Union of South Australia, has agreed to adopt a more stringent health investigation level of HIL B (residential with limited soil access) as a “trigger” for further engagement. This has been included at the direction of MFS and is for comparison purposes only.

No criteria are specific to assessing concrete and bitumen regarding potential human health or ecological risk. Sampling of these media has been conducted to determine their potential to act as an ongoing source of PFAS impact on the environment via leaching.

5.1.2 Ecological soil guideline values

The PFAS NEMP provides the following guidance regarding ecological risk for soils:

– The guideline value for indirect ecological exposure (0.01 mg/kg) is based on the dietary exposure of a secondary consumer as the most sensitive exposure pathway assessed. For example, if plants and soil-dwelling animals are present in an open space area, birds, small mammals, and reptiles will likely be present to consume these plants and animals. This guideline reflects the possibility of indirect PFAS exposure from any land use where PFAS may be present in a large soil area
– “For intensively developed sites with no secondary consumers and minimal potential for indirect ecological exposure, a higher criterion of up to 0.14 mg/kg may be appropriate
– “The indirect exposure value may be over-protective if the area of exposed soil is too small to have any material impact on food chain transfer to secondary consumers such as invertivores and carnivores. In this situation, considering site-specific characteristics may justify using a higher value (up to 0.14 mg/kg) as the trigger for a detailed site-specific investigation of risk”

Given the site includes both open areas with accessible soils and vegetation and areas of contaminated soils that are covered by hardstand and, therefore, largely inaccessible, both guidelines have been adopted for comparison.

The PFAS NEMP does not provide a rationale for the selection of the 0.14 mg/kg; however, GHD notes that this value was sourced from the same document as the other ecological criteria, namely Environment and Climate Change Canada (ECCC 2017) *Federal Environmental Quality Guidelines Perfluorooctane Sulfonate (PFOS)*. This document provides 0.14 mg/kg as the soil guidelines for PFOS in two circumstances:

– Soil Quality Guideline to Protect Freshwater Life under all land uses
– Soil Quality Guideline for Off-site migration under commercial/industrial land uses

The soil quality guideline to protect freshwater aquatic life is the concentration in soil expected to protect against potential impacts on freshwater aquatic life from PFOS originating in soil that may enter the groundwater and discharge to a surface water body. The calculation of this value was made based on the Canadian aquatic screening criteria for PFOS in surface water (6.8 ug/L) and a reverse fate and transport modelling process that assumes a minimum of 10 m lateral separation between the source and the surface water body and incorporates default parameters describing partitioning from soil to leachate, leaching to groundwater, mixing with groundwater and plume migration. The protection of aquatic life from soil impacts via migration in groundwater will be included in a groundwater assessment at the site. The closest aquatic receptor is the Barker Inlet Wetlands, approximately 1.7 km from the site, and a network of open stormwater drainage channels is bounding the site.

The soil quality guideline for off-site migration under commercial/industrial land use considers the potential that wind and water erosion of soil can move PFOS-contaminated soil from one site to another.

The endpoint to calculate this guideline is the soil quality guideline protective of ecological receptors in residential and agricultural land use settings (0.01 mg/kg - the ecological indirect criteria). A model was then used to predict soil movement, including the Universal Soil Loss and Wind Erosion Equations. CCME (2017) explicitly states that this approach is imprecise and that the derived values should be used as a check mechanism only, with professional judgement used to assess whether this is likely a migration pathway of concern for an individual site. Given the predominantly commercial land use surrounding the site, it is unlikely that any soil migrating from the site via erosion would be deposited in an area of significant ecological value.

Although the CCME (2017) guidelines have been superseded, the more recent guidelines (Specific Criteria Document for the Development of the Canadian Soil and Groundwater Quality Guidelines for the Protection of Environmental and Human Health - Perfluorooctane Sulfonate) use a similar approach and derive similar values. The reference to the CMME (2017) for this document is to maintain consistency with the PFAS NEMP 2.0 and the original reference material within that document.

5.2 Groundwater

5.2.1 Environmental values of groundwater

The South Australian Environment Protection (Water Quality) Policy 2015 (and amendments) (SA EPA 2015) (EPP) details the regulatory requirements for the protection of all water bodies (surface and groundwater) under the Environment Protection Act 1993. The Policy outlines the applicable environmental values (EVs) for a range of waters, including public stormwater and irrigation drains, as well as providing definitions of harm, types of pollutants and the provisions that a person must comply with in taking all reasonable and practicable measures to prevent or minimise harm. Table 5.2 outlines the EVs for various waters described in Schedule 1 of the EPP.

Table 5.2 Environmental Values of Particular Waters (Extract from Schedule 1, Table 3 WQEPP)

Waters	Aquatic ecosystems	Recreation and aesthetics	Drinking water for human consumption	Irrigation and general use	Livestock watering	Aquaculture and aquatic food production
Marine waters	X					X
Surface waters	X		X	X	X	X
Surface waters (Protection areas[1])	X	X	X	X	X	X
Public stormwater systems	X	X				
Groundwaters						
TDS < 1,200 mg/L			X	X	X	X
TDS between 1,200 - 3,000 mg/L				X	X	X
TDS between 3,000 - 12,000 mg/L					X	X

While not explicitly identified in the EPP, contaminated site assessments typically consider the potential for groundwater abstraction for recreational use and migration to aquatic ecosystems, so these EVs are included in the assessment process.

To assess the contamination status of groundwater at a site, the GAR (SA EPA 2019a) provides a four-step process to determine the environmental values of groundwater and if actual or potential harm to groundwater that is not trivial has occurred. The four-step process provided in the GAR is described in Table 5.3.

Table 5.3 Four-step Process for Determining Environmental Values of Groundwater

Process	Assessment
Step 1: Apply Table 3 of Schedule 1 of the 2015 Water Quality Environment Protection Policy (WQEPP, Gov SA 2015) based on TDS ranges	A review of the Water Connect database identified 393 registered bores within a 2.0 km radius of the site. TDS data recorded for the four closest wells (<0.7 km) with TDS data less than 30 years old ranged between 1,984 mg/L to 76,000 mg/L, indicating slightly saline (1,000 mg/L - 3,000 mg/L) to saline water.
Step 2: Assess and identify surface water bodies within a 2.0 km buffer of the site	The nearest surface water bodies from the site are a concrete-lined stormwater drainage channel located abutting the western site boundary line and the Barker Inlet Wetlands located approximately 1.7 km northeast.
Step 3: Review registered groundwater users in the WaterConnect database	A review of the WaterConnect database (February 2023) identified 393 registered bores within a 2.0 km radius of the site. The identified uses of the bores with operational or unknown status were investigation (163), observation (33), environmental (31), monitoring (23), domestic (19), drainage (9), irrigation (2), industrial (2), drainage and observation (1) and recreational (1).
Step 4: Application of the SA EPA recognised criteria for the most sensitive environmental value	The most sensitive environmental values to be applied to the site are PFAS NEMP 2020 Ecological water quality guidelines 99% species protection for fresh and marine environments. Immediately adjacent to the site's western boundary is a stormwater channel that feeds into the Barker Inlet Wetlands, located approximately 1.7km from the site. This is a sensitive receptor with high conservation value, which feeds into the North arm Creek of the Port River. The wetlands were constructed in 1998 to process stormwater and improve water quality before discharge into Aquatic Reserves and areas of more sensitive use. The TDS values identified within the groundwater on-site were above what the WQEPP for the potable use of water; however, the use of groundwater for the irrigation of vegetables is still possible, although the irrigation wells identified were associated with the West Croydon Football Club and Regency Park Golf Course.

Based on the assessment outlined in Table 5.3, the groundwater criteria have been selected to protect the relevant environmental values identified for groundwater underlying the area of investigation.

For this assessment, the criteria have been included to:

– Assess the potential risk to people using groundwater for recreational purposes (i.e., filling of swimming pools, discharge of groundwater to surface water bodies used for recreational activities)
– Assess the potential human health associated with the discharge of storm and groundwaters to surface water bodies used for recreational purposes
– Assess the potential risk to users of groundwater for irrigation of edible vegetation
– Assess the potential ecological risks associated with the discharge of storm and groundwaters to surface water receptors (fresh or marine), a 99% species protection for both freshwater and marine environments

The adopted groundwater screening/investigation levels, which are considered to protect potentially complete source receptor linkages, are summarised in Table 5.4.

Table 5.4 Adopted PFAS Interim Screening Criteria for Groundwater

Exposure Scenario	PFOS[1]	PFHxS[2]	Sum of PFOS and PFHxS	PFOA[3]	Source
Human Health – Recreational Water (domestic) - µg/L	0.7	0.7	0.7	5.6	NHMRC 2008 ADWG (NHMRC 2011)[4]
Marine and freshwater 99% Species Protection – Slightly to moderately modified ecosystems - µg/L	0.00023	-	-	19	PFAS NEMP (HEPA 2020)
Human Health - Recreational Water	2	2	2	10	PFAS NEMP (HEPA 2020)

Notes:
[1] PFOS – perfluorooctane sulfonate
[2] PFHxS – perfluorohexane sulfonate
[3] PFOA – perfluorooctanoic acid
[4] The NHMRC 2008 Guidelines for Managing Risks in Recreational Water recommend health criteria corresponding to 10 times the current drinking water value. These guideline values apply in a domestic setting where groundwater is used for recreational purposes such as filling swimming pools.
[5] Australian Drinking Water Guidelines 6, Version 3.7, updated January 2022

6. Soil investigation

The soil investigation works described in this section were conducted between the 24th and 25th of October 2023 under the supervision of an experienced GHD environmental professional.

6.1 Soil sample locations and rationale

Twelve bores (BH01 to BH12) were drilled near the Fire Station and Engineering Workshop as part of the soil investigation. Five additional bores were drilled to install groundwater monitoring wells (MW01 to MW05) located within the historical training area and Fire Station.

Sampling locations are shown in Figure 4. A rationale behind each area is provided in Table 6.1.

Table 6.1 Soil Bore Location Rationale

Proposed Soil Bore ID	Location Description	Rationale
BH01	The northwestern portion of the Fire Station/west of the engine bay	To confirm the vertical extent of PFOS results reported in sample (Angle 1) collected during GHD investigations in 2019 and for general site coverage purposes
BH02	The northeastern corner of the Fire Station.	General site coverage
BH03	The rear of the storage shed (western end) located at the south of the Fire Station	Targeting inside the rear storage shed where known storage of AFFF containing PFAS has occurred historically
BH04	The southeastern portion of the Fire Station/Rear yard	Targeting areas of the fire station where training activities using and flushing of AFFF containing PFAS has occurred historically
BH05	In the car parking area afront the Engineering Workshop	General site coverage
BH06	The eastern side of the Fire Station building	To confirm the vertical extent of PFOS results reported in sample (Angle 2) collected during GHD investigations in 2019 and for general site coverage purposes
BH07	The southwestern side of the Engineering Workshop	Targeting the potential for PFAS impacted soil associated with the Engineering workshop/appliance maintenance
BH08		
BH09	The central portion of land located immediately east of the Engineering Workshop	General site coverage
BH10		
BH11	The southern portion of land located immediately east of the Engineering Workshop	
BH12		
MW01	The northwestern corner of the Historical Training Area	To determine wether leaching of PFAS from contaminated soils has occurred within groundwater adjacent to the rear storage shed where known storage of AFFF containing PFAS has occurred historically
MW02	The southern boundary of the Historical Training Area	To determine wether leaching of PFAS from contaminated soils has occurred in groundwater within the historical training area.
MW03	Directly adjacent wrecked car storage area north of the Urban Search and Rescue Training Area	
MW04	The eastern portion of Historical Training Area	

Proposed Soil Bore ID	Location Description	Rationale
MW05	The rear of the Fire Station within the car park	To determine wether leaching of PFAS from contaminated soils has occurred in groundwater within the rear yard of the Fire Station following historical training and flushing of equipment.
SS01	The unsealed area of SA Power Networks training area.	To investigate the possibility of PFAS contamination occurring in soils due to accidental overspray
SS02		

GHD notes the number of soil sampling locations was per the NSW Sampling Design Guidelines requirement for the minimum number of sampling locations for a site with an area of 153,034 m^2.

In addition to the soil bore sampling program outlined above, 21 test pits were excavated in an approximate grid across the remaining unsealed areas of the site (i.e. outside of the Fire Station and engineering workshop assets) to obtain representative soil data for the broader site.

Test pits were positioned in locations targeting known areas where historical use of AFFF containing PFAS occurred and where potential PFAS-impacted soil was thought to be. These included the historical MFS training area and the land immediately east, the Urban Search and Rescue training area and the Emergency Services training area. Two surface soil samples were taken instead of test pits within the SAPN training area.

The number of test pits proposed was prepared with reference to the NSW EPA Sampling Design Guidelines Part 1 (NSW EPA, 2022) and considered an appropriate density to provide sufficient information relating to the PFAS contamination status of soils. All test pits were proposed to be excavated to a depth of approximately 2.0 m bgl.

Sediment investigation works described in this section were conducted on 25 October 2023 as part of a test pit sampling program variation. The PSI (GHD 2023a) identified that AFFF used during historical training activities was collected in the stormwater drains south of the Fire Station in the rear yard, discharging into the adjacent stormwater diversion channel along the western site boundary.

The SAQP (GHD 2023b) outlined the sampling of sediment at three locations, two on-site drains in the Fire Station rear yard and one off-site in the stormwater outlet in the adjacent stormwater channel, to identify if potentially PFAS-impacted stormwater may have migrated off-site.

The on-site stormwater outlet did not contain significant sediment, and only one location (SD03) could be sampled.

A figure showing the locations where soil samples were collected is presented in Figure 4.

6.2 Methodology

6.2.1 Soil and sediment investigation

The soil investigation methodology was as follows:

– Before any intrusive works were undertaken, a review of Before You Dig plans was conducted. An accredited service locator (Veris Australia Pty Ltd.) cleared all investigation locations for underground services
– Seventeen bores (BH01 to BH12 and MW01 to MW05) were drilled as part of the soil investigation—locations within hardstand areas required concrete/paver cutting before drilling
    - Eight soil bores (BH01 to BH08) were advanced with an eziprobe drill rig, operated by WB Drilling Pty Ltd., utilising the push tube drilling technique. High-density polyethylene (HDPE) core liners were used to retrieve soil cores to minimise the risk of PFAS cross-contamination
    - Four soil bores (BH09 to BH12) were advanced utilising hand augers undertaken by GHD field scientists,
– Nineteen test pits (TP01 to TP23, except TP13, TP19, TP20 and TP21) were excavated in the soil investigation location positions within the historic MFS training area
– Two soil samples (SS01 and SS02) were taken from the SA Power Networks training area instead of test pits to identify potential impacts from AFFF foam overspray during historical MFS training activities. Samples were taken with a stainless-steel spatula and decontaminated between each sampling location

– All test pits were advanced by a licenced operator using a backhoe, with test pits being excavated to a maximum of 2.0 m bgl
– A GHD environmental professional collected representative soil samples at regular depth intervals or adjusted them based on the lithology and visual, historical, and olfactory evidence of contamination
– One sediment sample (SD03) was collected from the stormwater channel along the western site boundary
– When collecting each sample, the sampler wore a fresh pair of disposable gloves, and samples were placed directly into laboratory-supplied jars suitable for PFAS analysis. Soil samples from soil bores were collected immediately following drilling
– Quality assurance and quality control (QA/QC) samples, including intra-laboratory duplicate samples, inter-laboratory duplicate (split) samples, and rinsate blanks, were collected as part of the soil sampling program
– An environmental scientist logged the soil bores to assess the underlying geology and contaminant indicators per AS 1726:2017
– Soil samples were stored in an ice-filled portable esky and transported to the analytical laboratories under chain of custody documentation

6.3 Soil analytical program

All soil samples were submitted to a NATA-accredited laboratory for analysis. Generally, two to three samples from each borehole or test pit were analysed for PFAS compounds.

6.4 Soil sampling results

6.4.1 Subsurface conditions

Fill material was generally encountered at depths ranging between 0.0 m bgl to 1.0 m bgl at all locations assessed, with the deepest encountered being 2.0 m bgl. Fill usually comprises a layer of fine to medium, poorly graded sand and subangular gravel. The colour of fill described in the bore logs ranged from dark black/brown to yellow/tan in appearance and was dry to slightly moist. Glass was noted between the depth of 0.25 - 0.45 m bgl at BH01, with no other foreign material being encountered. No evidence of asbestos or any staining or odours was detected during the investigation.

This was generally consistent with most of the historical training area, with fill material typically encountered between depths of 0.0 – 0.7 m bgl at all locations assessed. This generally comprises a layer of fine to medium, poorly graded sand and subangular gravel. The colour of fill described in the bore logs ranged from dark black/brown to yellow/tan in appearance and was dry to slightly moist. Foreign material was included at several locations within the fill, with discarded firefighters' boots being encountered at TP08. No evidence of asbestos was detected during the investigation, nor was any staining or the presence of any distinguishable olfactory odours noted during sampling.

The underlying natural soil was encountered at all soil bore locations and generally comprised sandy clays with low to medium plasticity before progressing deeper into clayey sand at BH08 and sand at BH04.

A summary of materials encountered at the site is provided in Table 6.2. Individual borelogs can be found in Appendix D

Table 6.2 Summary of Lithologies Encountered

Lithology	Depths observed (m bgl)	Description
Fill	0.0 – 0.4	Gravelly SAND fine to medium, poorly graded, dark grey-black, subangular, fine to medium, poorly graded gravel (FILL)
	0.25 - 1.6	Clayey/gravelly SAND fine to medium, poorly graded, dark brown, angular (FILL)
	0.05 - 0.45	Gravelly SAND fine to medium grained, tan-brown, fine to medium gravels, slightly moist, loose
	0.08 - 3.0	Gravelly SAND fine to coarse, poorly graded, grey-brown, slightly moist, loose

Lithology	Depths observed (m bgl)	Description
	1.8 - 2.0	Sandy GRAVEL medium gravels, poorly graded, subangular to subrounded, dry, very loose
	0.08 - 1.8	SAND medium, well graded, pale yellow-tan, medium to coarse sand, dry, very loose
	0.4 - 0.7	SAND fine to medium, poorly graded, orange-brown, slightly moist, loose
Natural soils	0.5 - 4.0	Sandy CLAY medium plasticity, red-brown, slightly moist to moist, low to medium plasticity, firm to stiff
	3.1 - 4.5	Clayey SAND fine to medium, poorly graded, red-brown, moist, loose
	3.2 - 3.5	SAND fine to coarse, poorly graded, orange-brown, very moist, loose
	1.4 - 4.0	Sandy CLAY low to medium plasticity, orange-brown, slightly moist, firm

6.4.2 Analytical results

The results of the adopted PFAS assessment criteria are presented in Table 6.3 below.

The laboratory certificates, chain of custody and sample receipt notifications are provided in Appendix K. A complete set of tabulated analytical results can be found in Table 1.

Table 6.3 Results Above Adopted PFAS Assessment Criteria

PFAS/PFOS Analyte	Location	Concentration (mg/kg)	Investigation Level Exceeded
Perfluorooctane sulfonic acid (PFOS)	BH01_0.2-0.3	0.0499	PFAS NEMP 2.0 2020 Ecological indirect exposure – Accessible soils (0.01 mg/kg)
	BH03_0.4-0.5	0.0165	
	TP4_0.0-0.2	0.103	
	TP7_0.0-0.2	0.0128	
	TP8_0.0-0.2	0.0522	
	TP11_0.4-0.5	0.0243	
	TP14_0.0-0.2	0.0115	
	TP16_0-0.1	0.0198	
	TP17_0.0-0.2	0.0459	
	TP22_0.0-0.2	0.0550	
	TP23_0-0.2	0.0163	
	SS02	0.0245	
	Angle_1*	0.057	
	Angle_2*	0.055	
	TRAIN_2*	0.21	
	BH04_0.6-0.7	0.312	PFAS NEMP 2.0 2020 Ecological indirect exposure – Developed Areas (0.14 mg/kg)
	BH04_1.4-1.5	0.151	

Notes:
* Historical Sampling Location

The concentrations of all remaining PFAS chemicals in the samples assessed were reported either below the laboratory reporting limits or below the adopted ecological and health assessment criteria.

There were no exceedances of the adopted assessment criteria for either of the adopted human health criteria, with PFAS concentrations for all 105 primary samples analysed ranging between 0.105 mg/kg and 0.0004 mg/kg for the sum of PFHxS and PFOS. Overall, 78 samples had PFHxS and PFOS detections, with the remaining samples analysed reporting concentrations below the Limit of Reporting (LOR).

6.5 Sediment analytical results

There were no reported exceedances of the adopted assessment criteria for either human health or ecology.

The laboratory certificates, chain of custody and sample receipt notifications are provided in Appendix K. A complete set of tabulated analytical results can be found in Table 1.

7. Paver investigation

7.1 Scope of works and rationale

Paver and concrete sampling was conducted with the soil investigation works on 23 and 24 October 2023. Section 5.1.1 states no available criteria are specific to assessing concrete and pavers regarding potential human health or ecological risk. These media have been sampled to determine their potential to act as an ongoing source of PFAS impact via leaching.

Three paver samples were analysed as part of the soil investigation (BH04_PAVER, BH07_PAVER and MW05_PAVER). Note BH07_PAVER was a sample of concrete collected from the engineering workshop area. Sample locations are shown on Figure 4.

7.2 Methodology

The following works were undertaken as part of the paver investigation:

– Samples were collected from extracted concrete cores by hand with a pair of clean nitrile gloves,
– Samples were placed into laboratory-supplied sampling jars or bags suitable for PFAS analysis, put in a cooler and transported to the analytical laboratories under chain of custody documentation protocols,
– Collection of QA/QC samples, including intra-laboratory (blind) duplicate and inter-laboratory (split) duplicate samples

7.3 Analytical results

PFAS compounds were identified in the paver samples, which likely represent an ongoing source of contamination from storm and surface water runoff into the surrounding soils and surface water systems.

The laboratory certificates, chain of custody and sample receipt notifications are provided in Appendix K. A complete set of tabulated analytical results can be found in Table 1.

8. Groundwater investigation

8.1 Groundwater well locations and rationale

The SAQP (GHD 2023b) outlined that five groundwater wells (MW01 to MW05) were scheduled to be installed at the site to target the following site features:

– One inferred cross/up-hydraulic gradient well is located east of the site (MW04) to calculate the local groundwater flow direction and determine if PFAS impacts groundwater within the east portion of the historical training area
– Two inferred up-hydraulic gradient wells are located on the southeast and south of the site (MW02 and MW03) to calculate the local groundwater flow direction and determine the potential presence of on-site PFAS sources
– Two inferred down-hydraulic gradient wells, located on the north-west of the historic MFS training area and directly south of the MFS fires station, to enable the calculation of the local groundwater flow direction and to determine the potential presence of on-site PFAS sources;

The rationale for the proposed groundwater well sampling locations is presented in Table 10.1. The location of the monitoring wells is shown in Figure 4.

Table 8.1 Groundwater Sampling Locations and Rationale

Proposed Well ID	Location Description	Rationale
MW01	Located in the northwestern portion of the historical training area, immediately south of the Fire Station storage shed	To determine the potential for PFAS to have impacted groundwater due to historical MFS training activities in the north-western portion of the former training area and any leaks associated with the historical storage of AFFF containing PFAS in the Fire Station storage shed.
MW02	Located in the central southern portion of the historical training area	To determine the potential for PFAS to have impacted groundwater due to historical MFS training activities in the south portion of the former training area.
MW03	Located adjacent to the stockpile of car wreckage used for MFS training (a known source area of AFFF application)	To determine the potential for PFAS to have impacted groundwater due to historical MFS training activities in this location where the known historical application of AFFF containing PFAS has occurred.
MW04	Located in the eastern portion of the historical MFS training area (in a known source area of AFFF application)	To determine the potential for PFAS to have impacted groundwater due to historical MFS training activities in this location where the known historical application of AFFF containing PFAS has occurred.
MW05	Located in the Fire Station rear yard	To determine the potential for PFAS to have impacted groundwater due to historic training activities and appliance washdown practices.

8.2 Well installation methodology

All groundwater monitoring wells were drilled and installed by WB Drilling Pty Ltd. under the supervision of an experienced GHD environmental professional. The drilling method used included a solid flight auger to the base of the borehole. A well permit was obtained from the Government of South Australia's Department of Environment and Water. Copies of well permits are provided in Appendix F.

Table 10.2 summarises the construction and wells' survey details (elevation). Groundwater well construction logs are provided in Appendix D.

Table 8.2 Well Construction Details

Item	Details				
Well ID	MW01	MW02	MW03	MW04	MW05
Date Installed	24/10/2023	24/10/2023	24/10/2023	24/10/2023	24/10/2023
Bore Depth	5.0 m bgl	5.0 m bgl	5.0 m bgl	5.0 m bgl	5.0 m bgl
Screen & Casing	PVC Class 18				
Screen & Casing Internal Diameter (mm)	50 mm				
Screen Length	3 m				
Casing Length	2.8 m	2.782 m	2.675 m	2 m	2 m
Well Depth (m bgl)	5 m	5 m	5 m	5 m	5 m
Ground Level (m AHD*)	3.935 m	4.925 m	4.521 m	4.894 m	3.812 m
TOC Level (m AHD)	4.753 m	5.725 m	5.198 m	4.787 m	3.725 m
Filter Pack	Filter Gravel (8/16) pack from the base of the well to 0.5m above the screen				
Casing Seal	0.5 m of activated bentonite was placed on top of the filter pack. Grouted from the bentonite layer to the ground surface.				
Well Cover	Steel “Monument” standpipe cover			Flush-mounted “Gatic” road cover	

Following installation, the groundwater wells were developed to remove excess silt/entrained sediments and ensure representative groundwater flowed into the well. The wells were developed using a steel bailer. The bailer was decontaminated between locations using a phosphate-free detergent ‘decon-90’ and rinsed with tap water and then deionised water.

Groundwater wells were surveyed by a licensed surveyor (Linkup). The survey results are included in Appendix G.

8.3 Groundwater sampling methodology

An experienced GHD environmental professional collected groundwater samples per GHD’s standard operating procedures for groundwater sampling and SA EPA guidelines for regulatory monitoring and testing – Groundwater sampling (April 2019).

All groundwater wells were left for a minimum of seven days following well development to allow for the stabilisation of aquifer conditions. Groundwater sampling was conducted on 2 November 2023.

All groundwater wells were gauged before sampling. SWLs were measured from the top of the well casing (TOC) using an interface probe.

All monitoring wells were purged and sampled using a low-flow sampling technique (peristaltic pump). Water quality parameters were collected during purging, including pH, redox potential, dissolved oxygen, electrical conductivity, and temperature.

Groundwater samples were collected in appropriate containers provided by the analytical laboratory that were suitable for PFAS analysis. The samples were stored in a chilled portable cooler immediately following sampling and were delivered to the analytical laboratory with accompanying chain of custody documentation.

The groundwater gauging and sampling records are provided in Appendix H.

8.4 Groundwater analytical program

The laboratories used for the soil investigation were ALS Laboratory Group (primary laboratory) and Eurofins (Secondary Laboratory). Both laboratories are registered by the National Association of Testing Authorities (NATA), and the analyses conducted were conducted within their NATA registration.

PFAS Long Suite laboratory analysis of five primary samples from the on-site wells and four QA/QC samples (one duplicate pair of groundwater samples, one field blank and one rinsate blank) with standard LOR.

8.5 Groundwater investigation results

8.5.1 Groundwater levels and inferred groundwater flow

Groundwater levels in the wells were gauged from the marked point on the well casing on 26 October 2023 using an electronic interface water level meter. Well survey results are provided in Appendix G, and groundwater gauging sheets are provided in Appendix H.

Relative groundwater levels for each monitoring well are presented in Table 10.3.

Table 8.3 Relative Groundwater Levels (to AHD)

Well ID	Surveyed TOC (m AHD)	Surveyed Ground Level (m AHD)	Depth to Groundwater (m bTOC)	Relative groundwater level (m AHD)
MW01	4.753	3.935	3.772	0.981
MW02	5.725	4.925	4.555	1.17
MW03	5.198	4.521	4.004	1.194
MW04	4.787	4.894	3.551	1.236
MW05	3.725	3.812	2.759	0.966

The groundwater gauging results were used to construct a groundwater contour map, as shown in Figure 5 Groundwater was inferred to flow northwesterly, consistent with the expected regional groundwater flow.

8.5.2 Field-measured water quality parameters

Groundwater samples were collected on 2 November 2023. No contamination indicators (such as hydrocarbon or chemical type odours or sheens) were noted in any monitoring wells during installation, well development or sampling phases.

Groundwater quality parameters were monitored during purging and before sampling. The final values of these parameters before sampling are summarised in Table 10.4, showing:

– The groundwater at the site is neutral, with pH ranging between 6.73 and 6.97 pH units,
– The groundwater is brackish, with TDS values between 2,921 mg/L and 19,790 mg/L,
– The oxidation-reduction potential was positive in all wells, generally supported by the dissolved oxygen readings

Table 8.4 Field-Measured Groundwater Quality Parameters

Well ID	Date Sampled	Temp (°C)	pH	Total dissolved solids (mg/L) *	Oxidation-reduction potential (mV)	Electrical conductivity (µS/cm)
MW01	02/11/2023	19.3	6.85	7,309	142.9	10,393
MW02	02/11/2023	19.9	6.73	19,790	148.8	30,922
MW03	02/11/2023	19.5	6.78	12,296	145.1	19,213
MW04	02/11/2023	20.8	6.97	2,921	132.6	4,565
MW05	02/11/2023	20.7	6.88	6,748	133.6	10,544

* A conversion factor of 0.64 was used to convert field conductivity (µS/cm) to TDS (mg/L)

GHD notes that the wide range of electrical conductivity readings across the site may represent an error.

8.5.3 Groundwater analytical results

The exceedances of the adopted assessment criteria protective of human health and the environment are presented in Table 8.5 and Figure 7, PFAS concentrations in all remaining groundwater samples, which were reported to be below the LOR or the adopted assessment criteria.

Table 8.5 Results Above Adopted PFAS Assessment Criteria

Location	PFHxS (µg/L)	PFOS (µg/L)	PFOA (µg/L)	Sum of PFHxS and PFOS (µg/L)
MW01	0.28	1.52	0.04	1.80
MW03	0.18	0.02	<0.01	0.20
MW05	43.1	44.4	2.29	87.5

Notes:
Light blue depicts an exceedance of the PFAS NEMP 2.0 2020 Recreational Water Criteria.
Dark blue depicts an exceedance of PFAS NEMP 2.0 2020 Interim marine and fresh – 99% slightly to moderately disturbed system criteria.
Light green depicts an exceedance of NHMRC 2008 guidelines for recreational water (domestic) criteria.

The laboratory certificates, chain of custody and sample receipt notifications are provided in Appendix K. A complete set of tabulated analytical results can be found attached at the end of this report.

9. Quality Assurance and Quality Control

A detailed Quality Assurance and Control (QA/QC) assessment was completed for all analytical sample data to determine whether it is of suitable quality on which to base the site assessment. This included collecting and reviewing inter- and intra-laboratory duplicates and rinsate blank samples.

The QA/QC assessment found that most QA/QC Data Quality Indicators (DQIs) were within the specified requirements. Some PFAS compounds noted relative percentage difference (RPD) exceedances. However, this is likely due to the low concentrations of PFAS compounds detected in the samples. Therefore, The data is considered valid and of sufficient quality to rely on for the purpose and objectives of this assessment.

A copy of the detailed QA/QC report is provided in Appendix I.

10. Conceptual Site Model

Fundamental to any contamination investigation is the development of a CSM, which is a description of the plausible mechanisms ('pathway') by which people and ecology ('receptors') may be exposed to chemicals in the environment ('sources'). Potential risks to human health or the environment cannot occur without a complete Source-Pathway-Receptor (SPR) linkage. Conversely, complete SPR linkages do not, by default, indicate a risk and the site investigation process is used to evaluate the extent of potential risks.

Based on the potential SPR linkages identified in the preliminary site investigation (GHD 2023a) and additional information gleaned during this investigation, the CSM developed for the site has been refined and is summarised in Table 10.1.

SPR linkages were assessed under the following categories:

– Unknown – Insufficient data available to indicate if a linkage is present or absent
– Possible – Data indicates PFAS impacts or a potential source has been identified, and receptors are present; however, the extent of the source and pathways to a receptor are not understood
– Likely – the PFAS impact has been confirmed, and pathways to receptors are likely present; however, the extent of the connection has not been confirmed or is not fully understood.
– Confirmed – PFAS impact greater than the adopted assessment criteria is present at the receptor; hence, the SPR linkage has been confirmed as complete
– Unlikely – Source and pathways have not been identified or identified below the assessment criteria protective of the receptor; hence, the SPR linkage is unlikely to be complete

Visual representation of the CSM is shown in Figures 8 and 9.

Table 10.1 CSM for PFAS Exposure – SPR Linkage Assessment

Source	Potential Receptors	Exposure Pathways	Risk from exposure through SPR Linkages
On-site PFAS-impacted soils	Site users, visitors, maintenance, and construction workers	Direct dermal contact with contaminated soil	**Unlikely** PFAS concentrations detected in on-site soils were below the site-specific guidelines, and Tier 1 HIL B that was adopted. It is unlikely that site users, visitors, maintenance or construction workers would be exposed to PFAS quantities detrimental to their health.
		Incidental ingestion of contaminated soil	
		Inhalation of contaminated soil or dust from disturbed soils	
	The ecosystem at and immediately surrounding the site	Direct contact with contaminated soil	**Possible** PFAS concentrations detected to date in soil on-site exceeded the adopted interim ecological criteria for indirect exposure. Some areas of the site are unsealed, with vegetation present that may present a habitat for fauna, particularly reptiles.
		Ingestion of contaminated soil	
		Bioaccumulation through indirect contact	
	Groundwater beneath the site	Rainwater/surface runoff leaching impacted soil followed by migration through porous media into groundwater.	**Confirmed** The potential of PFAS leaching from contaminated soil into the groundwater has been confirmed, with concentrations above the adopted PFAS criteria identified in groundwater.
On-site PFAS impacted concrete and pavers	Stormwater and surface water runoff from the site	Leaching from impacted concrete and pavers into surface and storm waters.	**Possible** PFAS impacts have been identified in pavers and concrete at the rear of the MFS station site and adjacent Engineering workshop. PFAS compounds detected in concrete samples collected from within the fire station likely represent an ongoing source of contamination from storm and surface water runoff into underlying soils, groundwater and stormwater systems.
Off-site PFAS-impacted soils	Off-site maintenance and subsurface construction workers	Direct dermal contact with contaminated soil	**Unlikely** PFAS concentrations detected to date in on-site soils were below the adopted Tier 1 HIL B for residential properties with limited access to soil. It is unlikely that off-site visitors, maintenance, or construction workers would be exposed to PFAS quantities detrimental to their health. However, the extent of PFAS impacts on on-site and off-site soils has not yet been determined.
		Incidental ingestion of contaminated soil	
		Inhalation of contaminated soil or dust from disturbed soils	
	Off-site residential occupants	Direct dermal contact with contaminated soil	**Unlikely** No historical evidence suggests that any training activities occurred on adjacent lands. PFAS impacts identified in soils at the site are unlikely to
		Incidental ingestion of contaminated soil	

Source	Potential Receptors	Exposure Pathways	Risk from exposure through SPR Linkages
		Uptake through edible vegetation or biota.	migrate and were below the residential guidelines in locations sampled along the site's western side where adjacent residential properties do exist.
		Inhalation of contaminated soil or dust from disturbed soils	
	The ecosystem surrounding the site	Direct contact with contaminated soil	**Unlikely** No historical evidence suggests that any training activities occurred on adjacent lands. PFAS-impacted soils identified at the site are unlikely to migrate. The site is also primarily surrounded by heavily developed industrial/commercial land users and roads.
		Ingestion of contaminated soil	
		Bioaccumulation through indirect contact	
PFAS-impacted groundwater	People using groundwater for domestic and drinking purposes	Consumption of contaminated groundwater	**Unlikely** The presence of PFAS contamination in groundwater on-site has been confirmed, with the presence of PFAS contamination down hydraulic gradient of the site still not assessed. Nineteen domestic groundwater wells were identified within a 2.0 km radius of the site, with one located downgradient of the site. TDS data was registered for two domestic wells, with the lowest being 5109 mg/L, which is not considered suitable for consumption (Gov SA 2015).
	People using groundwater to irrigate vegetable gardens and fruit trees for consumption.	Consumption of fruit and vegetables irrigated by contaminated groundwater	**Possible** One registered well within a 2.0 km radius of the site had irrigation purposes. The extent of PFAS in groundwater down hydraulic gradient of the site has not been assessed, and residential properties with gardens where fruit and vegetables could be grown are present within 2.0 km of the site.
	People growing edible vegetation in open soil, which may interact with groundwater.	Consumption of PFAS impacted edible vegetation	**On-site: Unlikely** MFS staff have removed all edible vegetation from MFS sites.
			Off-site: Possible PFAS contamination in the groundwater downgradient of the site has not been assessed, and residential properties with gardens where fruit and vegetables could be grown are present within 2.0 km of the site.
	People using groundwater for recreational purposes, such as filling swimming pools	Incidental ingestion of contaminated groundwater	**Possible** PFAS contamination in the groundwater downgradient of the site has not been assessed, and one well within a 2.0 km radius of the site was identified as having a recreational purpose. However, this is upgradient of the site and is most likely associated with the Angle Park Greyhound track. Residential properties that may extract groundwater for recreational purposes (swimming pools) are within 2.0 km of the site.

Source	Potential Receptors	Exposure Pathways	Risk from exposure through SPR Linkages
	Down gradient off-site maintenance and sub-surface construction workers that contact PFAS-contaminated groundwater	Direct dermal contact or incidental ingestion of contaminated groundwater	**Unlikely** Whilst it is possible that off-site maintenance or sub-surface construction workers could incidentally ingest contaminated groundwater, it is unlikely that they will ingest quantities detrimental to their health.
	Barker Inlet Wetland	Direct contact and ingestion with contaminated groundwater. Bioaccumulation through direct contact.	**Possible** The Barker Inlet Wetlands lie within the 2.0 km radius of the site. Groundwater is reported to be at a minimum, approximately 2.0 m bgl and the depth of Dry Creek and groundwater elevations have not been assessed. The extent of PFAS in groundwater down hydraulic gradient of the site has not been assessed, nor has the interaction of Barker Inlet Wetland with the groundwater beneath it.
	Recreational users of Barker Inlet Wetlands	Direct contact and ingestion of contaminated groundwater.	**Possible** The Barker Inlet Wetlands lie within the 2.0 km radius of the site. Groundwater is reported to be at a minimum, approximately 2.0 m bgl and the depth of Dry Creek and groundwater elevations have not been assessed. The extent of PFAS in groundwater down hydraulic gradient of the site has not been assessed, nor has the interaction of Barker Inlet Wetland with the groundwater beneath it.
PFAS-impacted surface or stormwater runoff	Barker Inlet Wetland	Direct contact and ingestion of contaminated groundwater. Bioaccumulation through direct contact.	**Possible** The Barker Inlet Wetlands lie within the 2.0 km radius of the site. Groundwater is reported to be at a minimum, approximately 2.0 m bgl and the depth of Dry Creek and groundwater elevations have not been assessed. The extent of PFAS in groundwater down hydraulic gradient of the site has not been assessed, nor has the interaction of Barker Inlet Wetland with the groundwater beneath it. Following training activities and washdown of appliances, excess water and AFFF were treated as stormwater and expelled from the site into the adjacent stormwater diversion channel, which is directly linked to the Barker Inlet. Ongoing leaching of PFAS from contaminated surfaces at the station site may continue to discharge into the adjacent stormwater system.
	Recreational users of Barker Inlet Wetlands	Direct contact and ingestion with contaminated groundwater.	

11. Discussion

11.1 Soil

11.1.1 Human health

During the investigation, the dataset identified no exceedances of the human health HIL B or the MFS metropolitan staffed stations site specific HIL assessment criteria. PFAS-impacted soils have been vertically and laterally delineated, with low and acceptable risks for human health under the current use.

11.1.2 Ecological

The PFAS NEMP 2.0 (2020) direct and indirect ecological exposure risk values for PFOS and PFOA are protective of organisms that are in direct contact with soil (i.e., plants and worms) and secondary consumers (i.e., birds, small mammals, and reptiles), respectively.

The PFAS NEMP (2020) indirect ecological exposure value of 0.01 mg/kg is a default value derived for all land use scenarios. However, the PFAS NEMP (2020) also states that this guideline value may be overprotective and site-specific characteristics may justify the use of a higher value (0.14 mg/kg), for example, in scenarios where a site is located within an extensively built-up urban setting. However, the default value of 0.01 mg/kg has been retained based on a large portion of the site and impacted soils being accessible, with vegetation and grasses and the noted presence of reptiles (snakes).

Numerous exceedances of indirect ecological assessment criteria for PFOS were identified in soils across the areas of exposed soil at the site; however, it is noted that future development is planned for much of this area that will involve sealing the surface with hardstand to make it suitable for traffic and equipment storage. The exceedances were identified in both fill and natural soils, consisting of gravelly and clayey sand and to depths just above the reported groundwater levels (approximately 2 m bgl)

Given the presence of soils exceeding the adopted ecological criteria and the potential for secondary consumers, it is recommended that an assessment of the site's ecological significance (sensitive species and foraging habitat) be undertaken to determine the potential presence of receptors that the identified PFAS contamination may adversely impact.

11.2 Groundwater

Groundwater was encountered at approximately 2 m bgl at the site with an inferred flow direction of northwest. Elevated PFAS concentrations were identified within groundwater beneath the site, likely associated with the historical use of AFFF during training activities and appliance washdown. Impacts have not been laterally or vertically delineated, with only the on-site, upper quaternary aquifer assessed.

11.2.1 Human health

The PFAS NEMP 2.0 (2020) human health-based guidelines were calculated using the tolerable daily intake of PFOS and PFHxS as recommended by the Food Standards Australia and New Zealand (FSANZ, 2017). The recreational water guidelines were derived from the NHMRC (2019) water quality values, with the assumed amount of time spent within water for recreational purposes being 150 days per year. This is a conservative figure, and it is noted that there is a high variability in the actual frequency of time spent with recreational water resources.

Concentrations of both PFOS and PFHxS were identified above the adopted human health assessment criteria (recreational) at two (MW01 and MW05) of the five monitoring wells. Note there are no recreational uses for groundwater on the site.

Within the 2.0 km radius of the site, there are several wells with registered usage for domestic, irrigation and recreational purposes. The use of these for either irrigation of edible vegetation or water for recreational purposes, such as filling pools, cannot be ruled out and represents a potentially complete SPR linkage. Due to the groundwater's slightly to moderately saline nature, it is unlikely to be used for potable purposes.

Given the inferred groundwater flow direction, shown in Figure 5, and the order of magnitude of the exceedances located beneath the sealed ground, it is likely that historic training activities using AFFF occurred in both upgradient areas and the rear of the MFS site itself. This is represented in the conceptual site model, shown in Figure 8, and the cross-sectional conceptual site model in Figure 9, with the inferred PFAS point source allowed to soak through the soil on-site, migrating through the groundwater and impacting downgradient wells.

Concerning the above findings, further assessment of groundwater in off-site areas is required to delineate the impacts and the potential for unacceptable risks to human health.

11.2.2 Ecological

The PFAS NEMP 2.0 (2020) recommends adopting the ecological WQG for 99% high conservation value when assessing for bioaccumulative contaminants. This is due to the problematic nature of predicting the bioaccumulation of PFOS in water, with the 99% conservation value covering both bioaccumulation and biomagnification in higher trophic levels.

The groundwater analytical results identified exceedances of the applied ecological assessment criteria for PFOS at three locations. PFOS concentrations reported at MW01 and MW05 were several orders of magnitude above the criteria. The extent of the PFAS contamination with the groundwater has not yet been delineated to assess whether elevated PFAS levels could affect the Barker Inlet Wetlands. Given the inferred direction of the groundwater flow and the distance to the Inlet, the potential for migration and completion of the SPR linkage are low; however, a drainage channel exists adjacent to the site and downgradient from the site. The potential for interaction between the drainage/stormwater channel and groundwater is not currently understood.

The groundwater depth is relatively shallow, with trees potentially able to access the groundwater. The potential for impacted biota exists within areas of impacted shallow groundwater as demonstrated in.

Further assessment is required to delineate elevated PFAS concentrations in on- and off-site groundwater.

11.3 Sediment

It was identified that the stormwater diversion channel discharges water into the Barker Inlet wetlands, with the channel being sealed with concrete for approximately 410 m and unsealed for the remainder of the distance to the wetlands. PFAS concentrations within sediment were below assessment levels; however, the surveys completed by staff reported that all wastewater was discharged into the stormwater diversion channel.

Further assessment of the stormwater diversion channel is required to assess whether stormwater runoff associated with PFAS containing AFFF has impacted sediments downstream from the site and the ultimate receiving environment (Barker Inlet).

11.4 Surface/stormwater

Due to the historical discharge of PFAS-containing stormwater into the stormwater diversion channel and the potential for ongoing leaching from PFAS-impacted materials (pavers, etc.), further assessment of the stormwater leaving the site and the ultimate receiving location (Barker Inlet) be undertaken.

12. Conclusions and recommendations

Based on the results of the DSI, the following conclusions have been made:

- Subsurface lithologies encountered during soil investigations were consistent with regional conditions, consisting of a natural medium to low plasticity, sandy clay layer characteristic of the Pooraka formation, consistent across the site
- PFAS impacts within the soil at the site are most likely linked to the historical use of AFFF during training activities and appliance washdown
    - PFAS-impacted soils have been vertically and laterally delineated, with low and acceptable risks for human health under the current use
    - Concentrations above the adopted indirect ecological guidelines were identified across unsealed and vegetated site areas, representing a potential risk to ecological receptors. The exceedances were identified in both fill and natural soils, consisting of gravelly and clayey sand and depths just above the reported groundwater levels (approximately 2 m bgl). Delineation of the vertical and lateral extent of PFAS impacts above the adopted ecological criteria has been generally achieved
    - Given the presence of soils exceeding the adopted ecological criteria and the potential for secondary consumers, it is recommended that an assessment of the site's ecological significance (sensitive species and foraging habitat) be undertaken to determine the potential presence of receptors that the identified PFAS contamination may adversely impact
- Groundwater was encountered at approximately 2 m bgl at the site with an inferred flow direction of northwest.
- Elevated PFAS concentrations were identified within groundwater beneath the site, likely associated with the historical use of AFFF during training activities and appliance washdown
    - PFAS concentrations exceeded the adopted human health criteria for recreational water use. Both domestic (abstraction) and discharge to local surface water bodies
    - PFAS concentrations exceeded the adopted ecological guidelines in groundwater beneath the site
    - Impacts have not been laterally or vertically delineated, with only the on-site, upper quaternary aquifer assessed
- Due to the historical discharge of PFAS-containing stormwater into the stormwater diversion channel and the potential for ongoing leaching from PFAS-impacted materials (pavers, etc.), further assessment of the stormwater leaving the site and the ultimate receiving location (Barker Inlet) be undertaken

The following recommendations have been made:

- Additional monitoring wells should be installed on- and off-site to delineate the extent of PFAS contamination within groundwater
- Further, on-site sampling of contaminated soil to delineate the extent of PFAS contamination and its potential associated ecological risk
- Further assessment of the stormwater, the diversion channel, and receiving surface water bodies is needed to determine the potential for PFAS impacts on sediments and surface waters. There is also the potential for ongoing leaching of PFAS into stormwater, leaving the site from impacted soil and materials (pavers, etc.)
- Development and implementation of administrative controls to minimise risk and potential exposure of construction or maintenance workers to PFAS-impacted soils, should works involve those outlined in the conceptual site model (e.g., soil disturbance, dust inhalation and incidental ingestion)

13. References

ANZG 2018, Australian and New Zealand Guidelines for Fresh and Marine Water Quality, online resource www.waterquality.gov.au/anz-guidelines, Australian and New Zealand Governments, updated 26 July 2021, (AWQG).

Australian Standard AS 1726.2017: Geotechnical Site Investigations.

Australian Standard AS 4482.1,2005: Guide to the investigation and sampling of sites with potentially contaminated soil – Part 1: Non-volatile and semi-volatile compounds.

Australian Standard AS 5667.6.1998: Part 6: Guidance on sampling of rivers and streams.

Australian Standard AS 5667.11.1998: Part 11: Guidance on sampling of groundwaters.

Australian Standard AS 5667.12.1998: Part 12: Guidance on sampling of bottom sediments.

DEW 2022, WaterConnect online data base for groundwater and surface water, Department for Environment and Water, South Australia, via www.waterconnect.sa.gov.au.

Gerges, N. 2006, Overview of the hydrogeology of the Adelaide metropolitan area, Department of Water, Land and Biodiversity Conservation, South Australia, DWLBC Report 2006/10, June 2006.

GHD 2018, Environmental Investigation, Oakden Fire Station, Report prepared for the South Australian Metropolitan Fire Service by GHD Pty Ltd, 23 October 2018.

GHD 2019, MFS Statewide Appliance and Station Sampling, Report prepared for the South Australian Metropolitan Fire Service by GHD Pty Ltd, May 2019.

GHD 2022, MFS 17 Fire Stations, PFAS Risk Profiling, Report prepared for the South Australian Metropolitan Fire Service by GHD Pty Ltd, 26 October 2022.

GHD 2023a, MFS Angle Park Facilities, Preliminary Site Investigation, Report for South Australian Fire Service, July 2023.

GHD 2023b, MFS Angle Park Facilities, Sampling and Analysis Quality Plan, Report for South Australian Fire Service, 12 September 2023.

Gov SA 1993, Environment Protection Act 1993, Version 9.9.2021, Government of South Australia, updated 2021.

Gov SA 2009, Environment Protection Regulations 2009, Version 1.7.2022, Government of South Australia, updated 2022.

Gov SA 2015, Environment Protection (Water Quality) Policy 2015 (WQEPP), Version 1.7.2020, Government of South Australia, updated 2020.

HEPA 2020, PFAS National Environmental Management Plan (Version 2.0), Heads of Environment Protection Authorities Australia and New Zealand, January 2020. (PFAS NEMP).

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

NHMRC 2008, Guidelines for Managing Risks in Recreational Water, National Health and Medical Research Council and Natural Resources Management Ministerial Council, Commonwealth of Australia, updated with the recent changes in the ADWG – V3.7 – January 2022.

NHMRC 2011, Australian Drinking Water Guidelines 6 (ADWG), Version 3.7, National Water Quality Management Strategy, National Health and Medical Research Council and Natural Resources Management Ministerial Council, Commonwealth of Australia, updated January 2022.

NUDLC 2020, Minimum Construction Requirements for Water Bores in Australia, 4th edition, National Uniform Drillers Licensing Committee, 2020.

SA EPA 2019a, Guidelines for the Assessment and Remediation (GAR) of Site Contamination, Environment Protection Authority, South Australia, November 2019.

SA EPA,2019b, Guidelines for Regulatory Monitoring and Testing – Groundwater Sampling, Environment Protection Authority, South Australia, 2019.

SARIG 2022, South Australian Resources Information Gateway, accessed September 2022 via **https://map**.sarig.sa.gov.au/.

South Australian Work Health and Safety Act, 2012 and Health Work and Safety Regulations, 2012.

WA DER (2017) Interim Guideline of Assessment and Management of Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS), Version 2.1, Contaminated Sites Guidelines, Department of Environment Regulation, Western Australia, Perth, January 2017.

Figures

Figure 1 *MFS Angle Park Site Location Plan*

Figure 2 *MFS Angle Park Surrounding Land Use Plan*

Figure 3 *MFS Angle Park Site Layout Plan*

Figure 4 *MFS Angle Park Soil and Groundwater Sampling Location Plan*

Figure 5 *MFS Angle Park Groundwater Contour Map*

Figure 6 *MFS Angle Park Soil Exceedances of Adopted Criteria*

Figure 7 *MFS Angle Park Groundwater Exceedances of Adopted Criteria*

Figure 8 *MFS Angle Park Conceptual Site Model*

Figure 9 *MFS Angle Park Conceptual Site Model Cross Section*

Data Disclaimer

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Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 54

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GHD

South Australian Metropolitan Fire Service
Angle Park Detailed Site Investigation

Angle Park Site Location Plan

Project No. **12616808**
Revision No. **A**
Date **28/11/2023**

FIGURE 1

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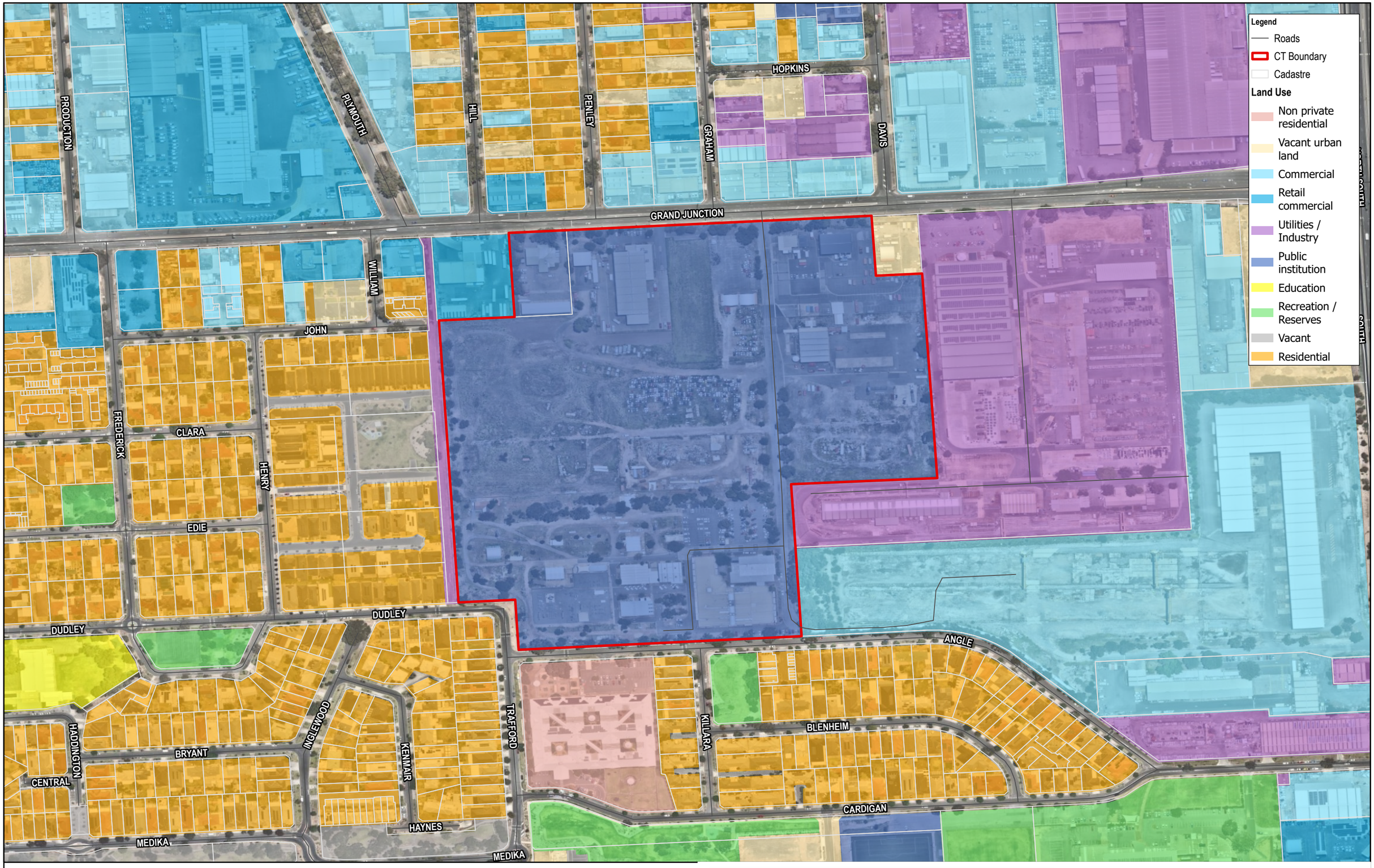
Print date: 28 Nov 2023 - 12:49

Data source: GHD: Site Boundary and Locations (2023). DPTI: Cadastre, Roads (2016), Railway (2013). Nearmap WMS: Imagery (2023). Created by: ejuan



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Paper Size ISO A3

0 25 50 75 100

Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 54

N

GHD

South Australian Metropolitan Fire Service
Angle Park Detailed Site Investigation

Angle Park Surrounding Land Use Plan

Project No. **12616808**
Revision No. **B**
Date **16/02/2024**

FIGURE 2

\\ghdnet\ghd\AU\Melbourne\Projects\33\12616808\GIS\Maps\Deliverables\12616808_AnglePark.aprx
Print date: 16 Feb 2024 - 13:54

Data source: GHD: Site Boundary and Locations (2023). DPTI: Cadastre, Roads (2016), Railway (2013). SAPPA: Land Use (2024). Nearmap WMS: Imagery (2023). Created by: ejuan

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Paper Size ISO A3

0 20 40 60 80

Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 54

N

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South Australian Metropolitan Fire Service
Angle Park Detailed Site Investigation

Project No. **12616808**
Revision No. **C**
Date **01/12/2023**

Angle Park Site Layout Plan

FIGURE 3

\\ghdnet\ghd\AU\Melbourne\Projects\33\12616808\GIS\Maps\Deliverables\12616808_AnglePark.aprx
Print date: 01 Dec 2023 - 12:10

Data source: GHD: Site Boundary and Locations (2023). DPTI: Cadastre, Roads (2016), Railway (2013). Nearmap WMS: Imagery (2023). Created by: ejuan

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Paper Size ISO A3

0 20 40 60 80 100 Meters

N

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 54

GHD

South Australian Metropolitan Fire Service
Angle Park Detailed Site Investigation

Angle Park Soil and Groundwater Sampling Location Plan

Project No. **12616808**
Revision No. **C**
Date **14/02/2024**

FIGURE 4

\\ghdnet\ghd\AU\Melbourne\Projects\33\12616808\GIS\Maps\Deliverables\12616808_AnglePark.aprx
Print date: 14 Feb 2024 - 22:11

Data source: GHD: Site Boundary and Locations (2023). DPTI: Cadastre, Roads (2016), Railway (2013). Nearmap WMS: Imagery (2023). Created by: ejuan

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Paper Size ISO A3

0 20 40 60 80

Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 54

N

GHD

South Australian Metropolitan Fire Service
Angle Park Detailed Site Investigation

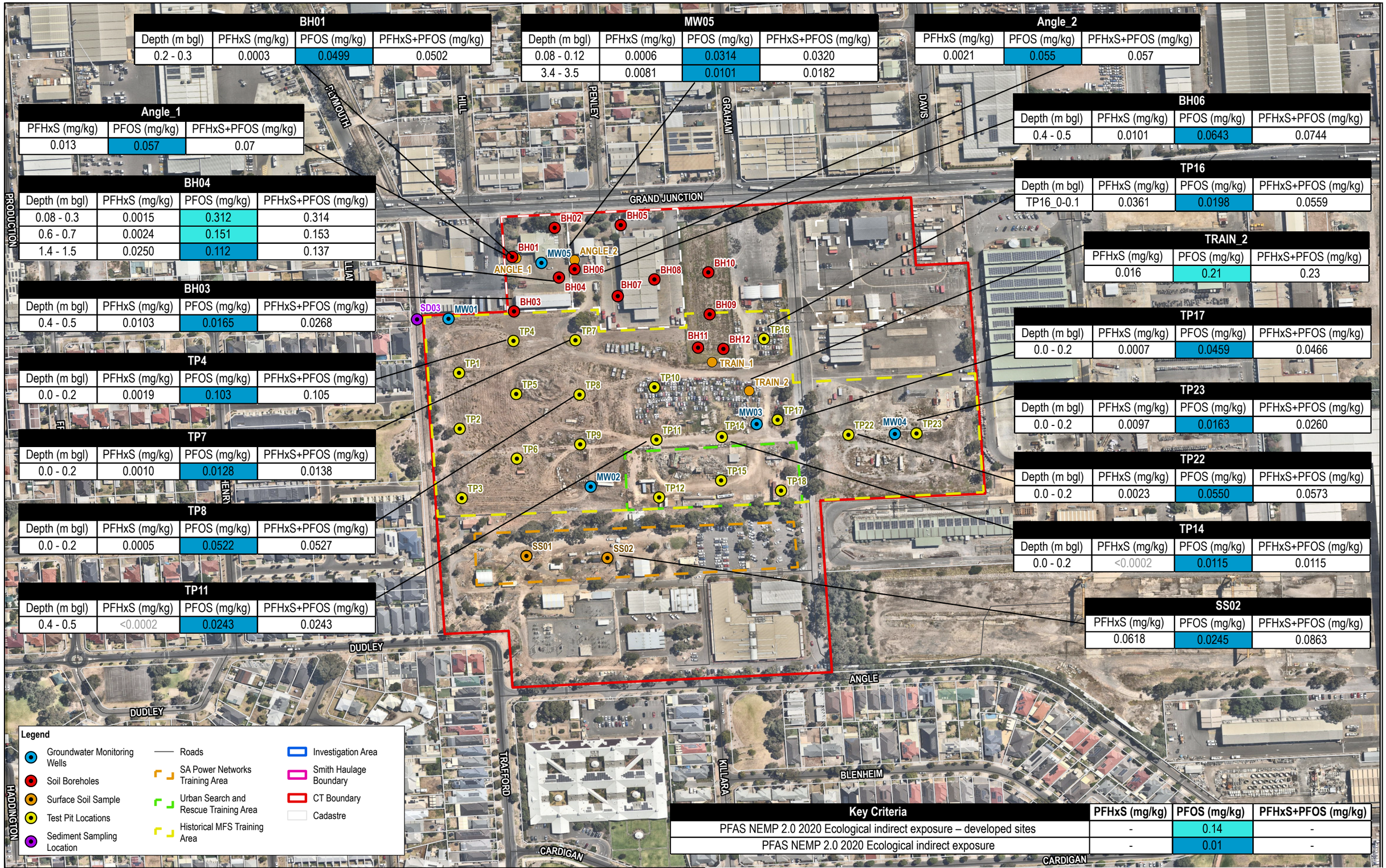
Angle Park
Groundwater Contour Map

Project No. **12616808**
Revision No. **C**
Date **14/02/2024**

FIGURE 5

\\ghdnet\ghd\AU\Melbourne\Projects\33\12616808\GIS\Maps\Deliverables\12616808_AnglePark.aprx
Print date: 14 Feb 2024 - 22:29

Data source: GHD: Site Boundary and Locations (2023). DPTI: Cadastre, Roads (2016), Railway (2013). Nearmap WMS: Imagery (2023). Created by: ejuan



BH01			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.2 - 0.3	0.0003	0.0499	0.0502

MW05			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.08 - 0.12	0.0006	0.0314	0.0320
3.4 - 3.5	0.0081	0.0101	0.0182

Angle_2		
PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0021	0.055	0.057

Angle_1		
PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.013	0.057	0.07

BH06			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.4 - 0.5	0.0101	0.0643	0.0744

BH04			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.08 - 0.3	0.0015	0.312	0.314
0.6 - 0.7	0.0024	0.151	0.153
1.4 - 1.5	0.0250	0.112	0.137

TP16			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
TP16_0-0.1	0.0361	0.0198	0.0559

TRAIN_2		
PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.016	0.21	0.23

BH03			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.4 - 0.5	0.0103	0.0165	0.0268

TP17			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 - 0.2	0.0007	0.0459	0.0466

TP4			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 - 0.2	0.0019	0.103	0.105

TP23			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 - 0.2	0.0097	0.0163	0.0260

TP7			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 - 0.2	0.0010	0.0128	0.0138

TP22			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 - 0.2	0.0023	0.0550	0.0573

TP8			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 - 0.2	0.0005	0.0522	0.0527

TP14			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 - 0.2	<0.0002	0.0115	0.0115

TP11			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.4 - 0.5	<0.0002	0.0243	0.0243

SS02		
PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0618	0.0245	0.0863

Legend

- Groundwater Monitoring Wells
- Soil Boreholes
- Surface Soil Sample
- Test Pit Locations
- Sediment Sampling Location
- Roads
- SA Power Networks Training Area
- Urban Search and Rescue Training Area
- Historical MFS Training Area
- Investigation Area
- Smith Haulage Boundary
- CT Boundary
- Cadastre

Key Criteria	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
PFAS NEMP 2.0 2020 Ecological indirect exposure – developed sites	-	0.14	-
PFAS NEMP 2.0 2020 Ecological indirect exposure	-	0.01	-

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Paper Size ISO A3

0 20 40 60 80 100

Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 54

N

GHD

South Australian Metropolitan Fire Service
Angle Park Detailed Site Investigation

Angle Park Soil Exceedances of Adopted Criteria

Project No. **12616808**
Revision No. **B**
Date **15/03/2024**

FIGURE 6

\\ghdnet\ghd\AU\Melbourne\Projects\33\12616808\GIS\Maps\Deliverables\12616808_AnglePark.aprx
Print date: 15 Mar 2024 - 17:40

Data source: GHD: Site Boundary and Locations (2023). DPTI: Cadastre, Roads (2016), Railway (2013). Nearmap WMS: Imagery (2023). Created by: ejuan

MW05			
PFOA	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
2.29	43.1	44.4	87.5

MW01			
PFOA	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.04	0.28	1.52	1.80

MW03			
PFOA	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
<0.01	0.18	0.02	0.20

Legend

- Groundwater Monitoring Wells
- Soil Boreholes
- Surface Soil Sample
- Test Pit Locations
- Sediment Sampling Location
- Roads
- SA Power Networks Training Area
- Urban Search and Rescue Training Area
- Historical MFS Training Area
- Investigation Area
- Smith Haulage Boundary
- CT Boundary
- Cadastre

Key Criteria	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)	PFOA (mg/kg)
PFAS NEMP 2.0 2020 Freshwater - 99% - high conservation value systems	-	0.00023	-	19
PFAS NEMP 2.0 2020 Recreational Water	2	2	2	10

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Paper Size ISO A3

0 20 40 60 80 100

Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 54

N

GHD

South Australian Metropolitan Fire Service
Angle Park Detailed Site Investigation

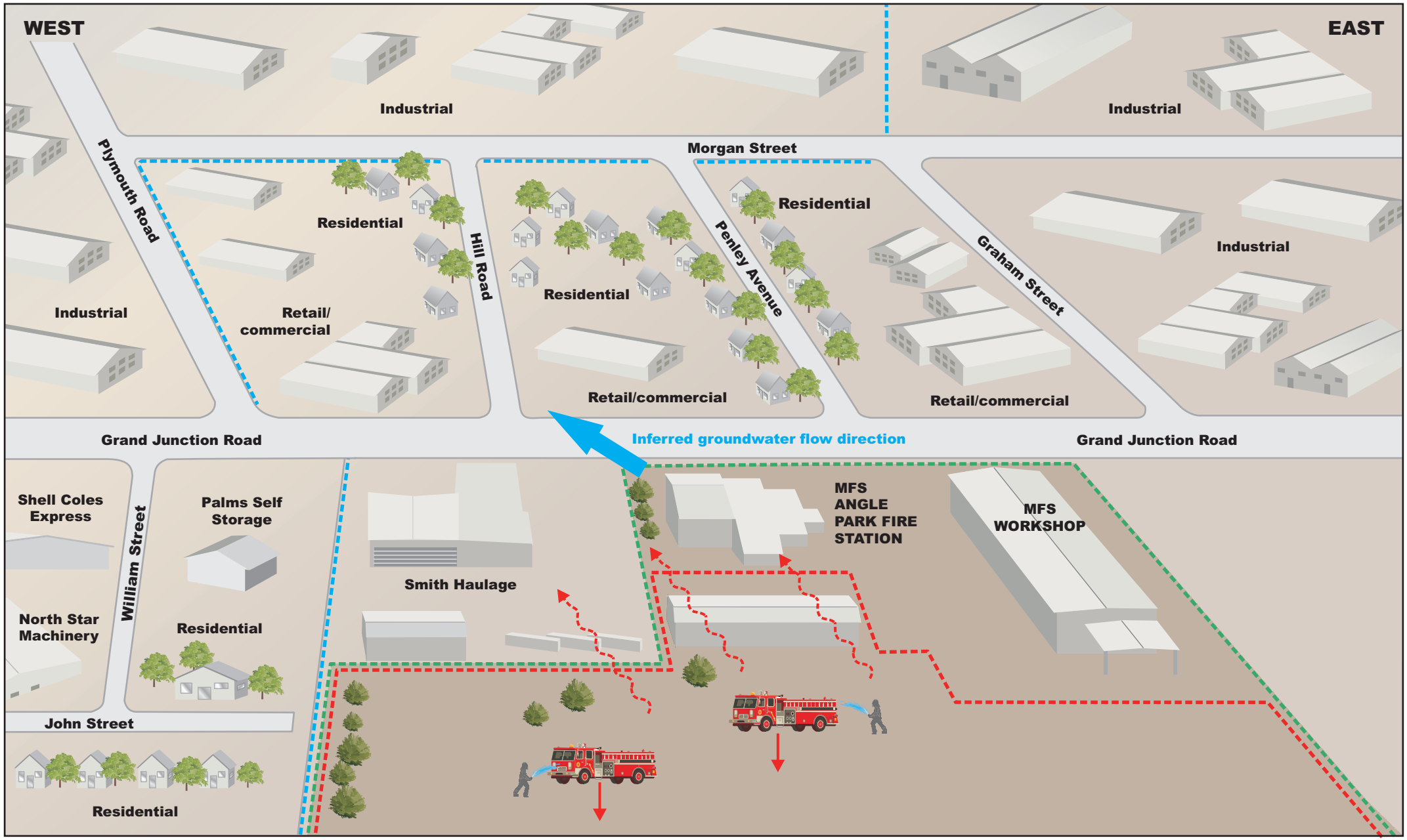
Angle Park Soil
Exceedances of Adopted Criteria

Project No. **12616808**
Revision No. **B**
Date **15/03/2024**

FIGURE 7

\\ghdnet\ghd\AU\Melbourne\Projects\33\12616808\GIS\Maps\Deliverables\12616808_AnglePark.aprx
Print date: 15 Mar 2024 - 17:51

Data source: GHD: Site Boundary and Locations (2023). DPTI: Cadastre, Roads (2016), Railway (2013). Nearmap WMS: Imagery (2023). Created by: ejuan



LEGEND

- Site boundary
- Historical MFS Training Area
- Stormwater drain
- PFAS migration
- Discharge of PFAS and AFFF to stormwater

Conceptual diagram only - not to scale

GHD

SA MFS
Angle Park DSI
456 Grand Junction Road, Angle Park, SA 5010

Conceptual site model

Project No. 12616808
Revision No. A
Date 01/12/2023

FIGURE 8

AU\Launceston\Projects\Admin\Graphics\12\616808\12616808_LST_01.cdr

Level 4, 211 Victoria Square Adelaide SA 5000 T 61 8 8111 6600 F 61 8 8111 6699 E ademail@ghd.com W www.ghd.com

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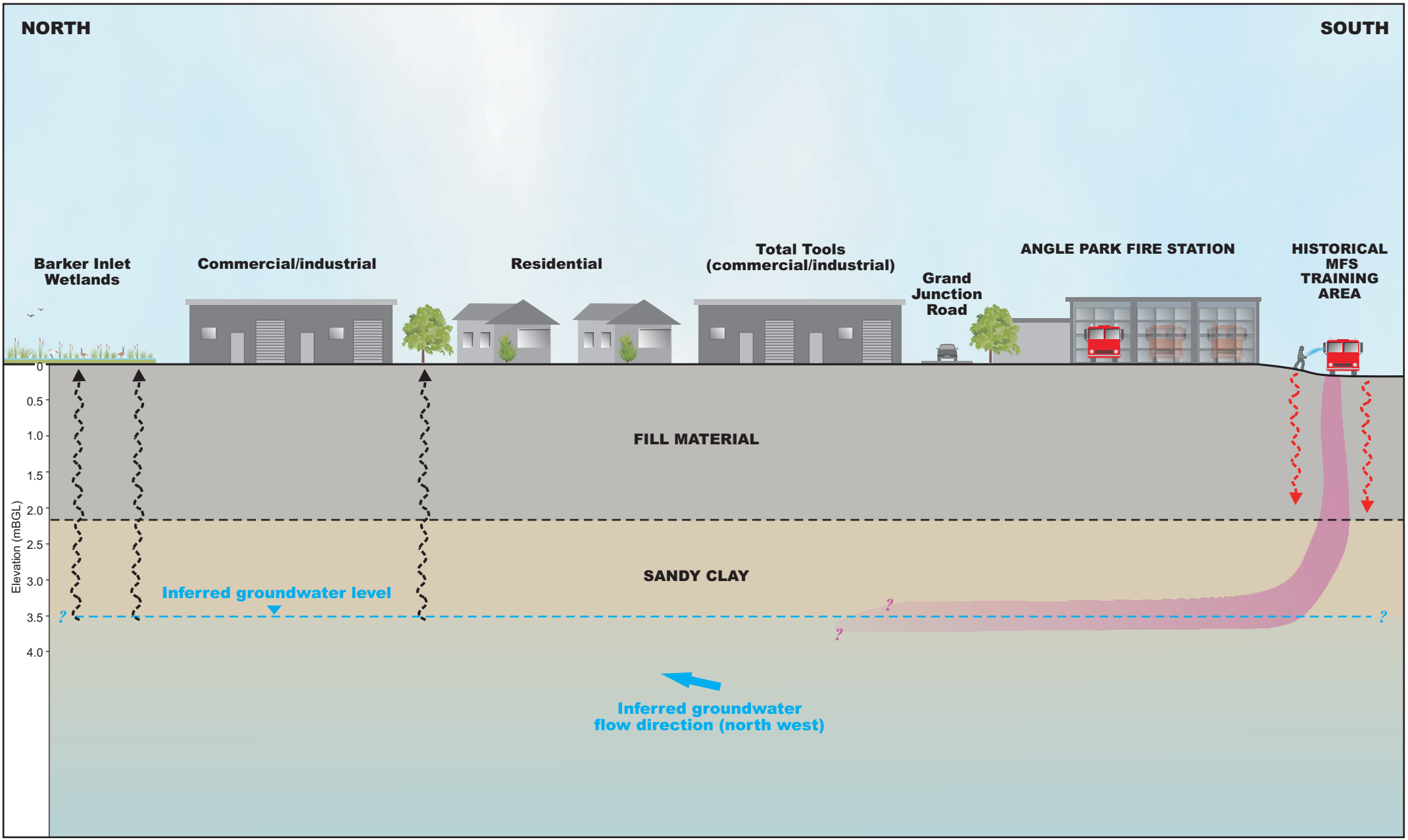

LEGEND

- PFAS biotic uptake
- PFAS impacted surface runoff infiltration
- Inferred PFAS point source

Conceptual diagram only - scale is approximate

GHD

SA MFS
Angle Park DSI
456 Grand Junction Road, Angle Park, SA 5010

Conceptual site model cross section

Project No. 12616808
Revision No. A
Date 02/12/2023

FIGURE 9

AU\Launceston\Projects\Admin\Graphics\12\616808\12616808_LST_02.cdr

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Tables

Table 1 Soil Analytical Results

Table 2 Groundwater Analytical Results

Table 3 Soil RPD Results

Table 4 Groundwater RPD Results

Table 5 Field Blank Results

			PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
			Perfluorobutane sulfonic acid (PFBS)	Perfluorodecanesulfonic acid (PFDS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluorobutanoic acid (PFBA)	Perfluorodecanoic acid (PFDA)	Perfluorododecanoic acid (PFDoDA)	Perfluoroheptanoic acid (PFHpA)	Perfluorohexanoic acid (PFHxA)	Perfluorononanoic acid (PFNA)	Perfluorooctanoic acid (PFOA)	Perfluoropentanoic acid (PFPeA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL			0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005	0.0002	0.0002
PFAS NEMP 2.0 2020 Ecological direct exposure						1									10				
PFAS NEMP 2.0 2020 Ecological indirect exposure – Developed sites						0.14[#1]													
PFAS NEMP 2.0 2020 Ecological indirect exposure – Undeveloped sites						0.01													
PFAS NEMP 2.0 2020 Residential w/ min opportunities for soil access (HIL B)						2		2							20				
SA MFS Site Specific Criteria - Metropolitan (Staffed)						14		14							50				
Date	**Field ID**	**Lab Report Number**																	
23 Oct 2023	BH01_0.2-0.3	EM2319031	<0.0002	<0.0002	<0.0002	0.0499	<0.0002	0.0003	<0.001	0.0002	<0.0002	<0.0002	0.0002	0.0005	<0.0002	0.0002	<0.0005	<0.0002	<0.0002
	FD02	EM2319124	<0.0002	<0.0002	<0.0002	0.0144	<0.0002	0.0005	<0.001	0.0016	0.0008	<0.0002	0.0004	0.0003	<0.0002	0.0005	<0.0005	0.0004	0.0006
	BH01_0.6-0.7	EM2319031	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	0.0036	<0.001	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	BH01_1.3-1.4	EM2319031	0.0003	<0.0002	<0.0002	0.0032	0.0004	0.0035	<0.001	<0.0002	<0.0002	<0.0002	0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	BH02_0.08-0.2	EM2319031	<0.0002	<0.0002	<0.0002	0.0010	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	BH02_0.9-1.0	EM2319031	<0.0002	<0.0002	<0.0002	0.0022	<0.0002	0.0008	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	BH03_0.01-0.3	EM2319031	<0.0002	<0.0002	<0.0002	0.0073	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	FD03	EM2319124	0.0003	<0.0002	0.0006	0.0127	0.0003	0.0056	<0.001	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	0.0004	0.0002	<0.0005	<0.0002	<0.0002
	BH03_0.4-0.5	EM2319031	0.0006	<0.0002	0.0005	0.0165	0.0005	0.0103	<0.001	<0.0002	<0.0002	<0.0002	0.0012	<0.0002	0.0004	0.0004	<0.0005	<0.0002	<0.0002
	BH03_1.2-1.3	EM2319031	0.0003	<0.0002	<0.0002	0.0062	<0.0002	0.0020	<0.001	<0.0002	<0.0002	<0.0002	0.0005	<0.0002	0.0003	<0.0002	<0.0005	<0.0002	<0.0002
	BH04_0.08-0.3	EM2319031	<0.0002	0.0021	0.0004	0.312	<0.0002	0.0015	<0.001	0.0005	<0.0002	<0.0002	0.0005	<0.0002	0.0002	0.0003	<0.0005	<0.0002	<0.0002
	BH04_0.6-0.7	EM2319031	<0.0002	<0.0002	0.0008	0.151	<0.0002	0.0024	<0.001	<0.0002	<0.0002	0.0003	0.0008	<0.0002	0.0006	0.0007	<0.0005	<0.0002	<0.0002
	BH04_1.4-1.5	EM2319031	<0.0002	0.0003	0.0032	0.112	0.0004	0.0250	<0.001	<0.0002	<0.0002	0.0013	0.0026	<0.0002	0.0028	0.0026	<0.0005	<0.0002	<0.0002
	BH04_PAVER	EM2319031	0.0006	<0.0002	0.0003	0.0069	0.0005	0.0048	<0.001	<0.0002	<0.0002	0.0002	0.0021	<0.0002	0.0004	0.0005	<0.0005	<0.0002	<0.0002
	FD01	EM2319124	0.0009	<0.0002	0.0006	0.0168	0.0012	0.0070	<0.001	<0.0002	<0.0002	0.0004	0.0028	<0.0002	0.0005	0.0009	<0.0005	<0.0002	<0.0002
	BH05_0.3-0.4	EM2319031	0.0003	<0.0002	<0.0002	0.0038	<0.0002	0.0013	<0.001	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	BH06_0.0-0.1	EM2319031	<0.0002	<0.0002	<0.0002	0.0072	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	BH06_0.4-0.5	EM2319031	<0.0002	<0.0002	0.0011	0.0643	<0.0002	0.0101	<0.001	<0.0002	<0.0002	0.0004	0.0006	<0.0002	0.0011	0.0005	<0.0005	<0.0002	<0.0002
	BH07_0.08-0.18	EM2319031	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	BH07_0.9-1.0	EM2319031	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.0002	0.0003	<0.0005	<0.0002	<0.0002
	BH07_2.4-2.5	EM2319031	<0.0002	<0.0002	<0.0002	0.0024	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	BH07_PAVER	EM2319031	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	BH08_0.08-0.15	EM2319031	<0.0002	<0.0002	<0.0002	0.0028	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	BH08_0.2-0.3	EM2319031	<0.0002	<0.0002	<0.0002	0.0038	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	BH08_1.9-2.0	EM2319031	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0005	<0.0005	<0.0002	<0.0002
17 Jan 2024	BH09_0.0-0.1	EM2400894	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	BH09_0.4-0.5	EM2400894	<0.0002	<0.0002	<0.0002	0.0058	<0.0002	0.0011	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	0.0003	<0.0002	<0.0005	<0.0002	<0.0002
	BH10_0.0-0.1	EM2400894	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	BH10_0.2-0.3	EM2400894	<0.0002	<0.0002	<0.0002	0.0010	<0.0002	0.0003	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	BH11_0.0-0.1	EM2400894	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	BH11_0.2-0.3	EM2400894	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	BH12_0.0-0.1	EM2400894	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	BH12_0.9-1.0	EM2400894	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	FD06	EM2400894	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
24 Oct 2023	MW01_0.01-0.1	EM2319031	<0.0002	<0.0002	<0.0002	0.0088	<0.0002	0.0005	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	MW01_0.4-0.5	EM2319031	<0.0002	<0.0002	<0.0002	0.0036	0.0004	0.0076	<0.001	<0.0002	<0.0002	0.0004	0.0009	<0.0002	0.0005	0.0006	<0.0005	<0.0002	<0.0002
	MW01_1.8-1.9	EM2319031	0.0002	<0.0002	<0.0002	0.0004	0.0002	0.0033	<0.001	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	MW02_0.3-0.4	EM2319031	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	FD04	EM2319124	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	MW02_0.5-0.6	EM2319031	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	MW03_0-0.1	EM2319031	<0.0002	<0.0002	<0.0002	0.0100	<0.0002	0.0003	<0.001	<0.0002	<0.0002	0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0005	<0.0002	<0.0002
	MW03_0.3-0.4	EM2319031	<0.0002	<0.0002	0.0002	0.0064	<0.0002	0.0025	<0.001	<0.0002	<0.0002	0.0005	0.0006	<0.0002	0.0009	0.0006	<0.0005	<0.0002	<0.0002
	MW03_1.4-1.5	EM2319031	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	MW04_0.2-0.3	EM2319031	<0.0002	<0.0002	<0.0002	0.0029	<0.0002	0.0039	<0.001	<0.0002	<0.0002	0.0003	0.0005	<0.0002	0.0037	<0.0002	<0.0005	<0.0002	<0.0002
	FD05	EM2319124	<0.0002	<0.0002	<0.0002	0.0018	<0.0002	0.0042	<0.001	<0.0002	<0.0002	0.0004	0.0007	<0.0002	0.0040	<0.0002	<0.0005	<0.0002	<0.0002
	MW04_0.75-0.85	EM2319031	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	MW04_2.1-2.2	EM2319031	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	MW05_0.08-0.12	EM2319031	<0.0002	0.0020	<0.0002	0.0314	<0.0002	0.0006	<0.001	0.0004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	MW05_1.4-1.5	EM2319031	0.0003	<0.0002	0.0022	0.0082	0.0004	0.0088	0.001	<0.0002	<0.0002	0.0012	0.0071	<0.0002	0.0015	0.0058	<0.0005	<0.0002	<0.0002
	MW05_3.4-3.5	EM2319031	0.0010	<0.0002	0.0004	0.0101	0.0011	0.0081	<0.001	<0.0002	<0.0002	0.0003	0.0026	<0.0002	0.0003	0.0008	<0.0005	<0.0002	<0.0002
	MW05_PAVER	EM2319031	<0.0002	<0.0002	<0.0002	0.0012	<0.0002	0.0006	<0.001	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002

			PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
			Perfluorobutane sulfonic acid (PFBS)	Perfluorodecanesulfonic acid (PFDS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluorobutanoic acid (PFBA)	Perfluorodecanoic acid (PFDA)	Perfluorododecanoic acid (PFDoDA)	Perfluoroheptanoic acid (PFHpA)	Perfluorohexanoic acid (PFHxA)	Perfluorononanoic acid (PFNA)	Perfluorooctanoic acid (PFOA)	Perfluoropentanoic acid (PFPeA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL			0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005	0.0002	0.0002
PFAS NEMP 2.0 2020 Ecological direct exposure						1									10				
PFAS NEMP 2.0 2020 Ecological indirect exposure – Developed sites						0.14[#1]													
PFAS NEMP 2.0 2020 Ecological indirect exposure – Undeveloped sites						0.01													
PFAS NEMP 2.0 2020 Residential w/ min opportunities for soil access (HIL B)						2		2							20				
SA MFS Site Specific Criteria - Metropolitan (Staffed)						14		14							50				
	TP1_0-0.2	EM2319031	<0.0002	<0.0002	<0.0002	0.0014	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0005	<0.0002	<0.0002
	TP1_0.4-0.5	EM2319031	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.001	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.0002	0.0005	<0.0005	<0.0002	<0.0002
	TP1_0.9-1.0	EM2319031	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	TP2_0-0.2	EM2319031	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	TP2_0.4-0.5	EM2319031	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	TP2_0.9-1.0	EM2319031	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	TP3_0.0-0.2	EM2319031	<0.0002	<0.0002	<0.0002	0.0024	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	TP3_0.4-0.5	EM2319124	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	TP4_0.0-0.2	EM2319124	<0.0002	0.0002	0.0007	0.103	<0.0002	0.0019	<0.001	0.0003	<0.0002	<0.0002	0.0003	0.0010	0.0005	0.0003	<0.0005	<0.0002	<0.0002
	QC1	EM2319124	<0.0002	0.0003	0.0009	0.135	<0.0002	0.0024	<0.001	0.0003	<0.0002	<0.0002	0.0004	0.0009	0.0007	0.0004	<0.0005	<0.0002	<0.0002
	TP4_0.9-1.0	EM2319124	0.0007	<0.0002	<0.0002	0.0004	0.0007	0.0031	<0.001	<0.0002	<0.0002	0.0002	0.0013	<0.0002	<0.0002	0.0011	<0.0005	<0.0002	<0.0002
	TP4_1.9-2.0	EM2319124	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	0.0005	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	TP5_0.0-0.2	EM2319124	<0.0002	<0.0002	<0.0002	0.0062	<0.0002	0.0007	<0.001	0.0005	<0.0002	0.0012	0.0016	0.0014	0.0034	0.0018	<0.0005	<0.0002	<0.0002
	TP5_0.4-0.5	EM2319124	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.001	<0.0002	<0.0002	<0.0002	0.0010	<0.0002	<0.0002	0.0010	<0.0005	<0.0002	<0.0002
	TP5_1.4-1.5	EM2319124	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	TP6_0.0-0.2	EM2319124	<0.0002	<0.0002	<0.0002	0.0018	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	TP6_0.4-0.5	EM2319124	<0.0002	<0.0002	<0.0002	0.0056	<0.0002	0.0031	<0.001	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	TP6_0.9-1.0	EM2319124	0.0011	<0.0002	<0.0002	<0.0002	0.0011	0.0039	<0.001	<0.0002	<0.0002	<0.0002	0.0015	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	TP7_0.0-0.2	EM2319124	<0.0002	0.0002	<0.0002	0.0128	<0.0002	0.0010	<0.001	0.0007	0.0003	0.0002	0.0004	0.0004	0.0004	0.0003	<0.0005	<0.0002	0.0003
	TP7_1.4-1.5	EM2319124	0.0024	<0.0002	<0.0002	<0.0002	0.0032	0.0050	0.001	<0.0002	<0.0002	0.0006	0.0071	<0.0002	<0.0002	0.0026	<0.0005	<0.0002	<0.0002
	TP7_1.9-2.0	EM2319124	0.0006	<0.0002	<0.0002	0.0005	0.0003	0.0006	<0.001	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	TP8_0.0-0.2	EM2319124	<0.0002	0.0004	<0.0002	0.0522	<0.0002	0.0005	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	TP8_0.4-0.5	EM2319124	0.0004	<0.0002	<0.0002	0.0015	0.0003	0.0033	<0.001	<0.0002	<0.0002	<0.0002	0.0008	<0.0002	0.0004	<0.0002	<0.0005	<0.0002	<0.0002
	TP8_0.9-1.0	EM2319124	0.0008	<0.0002	<0.0002	0.0020	0.0012	0.0020	<0.001	<0.0002	<0.0002	0.0002	0.0022	<0.0002	<0.0002	0.0002	<0.0005	<0.0002	<0.0002
	TP9_0.0-0.1	EM2319124	<0.0002	<0.0002	<0.0002	0.0021	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	TP9_0.4-0.5	EM2319124	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	TP9_0.9-1.0	EM2319124	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	TP10_0.0-0.2	EM2319124	<0.0002	<0.0002	<0.0002	0.0031	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	TP10_0.5-0.6	EM2319124	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.001	<0.0002	<0.0002	<0.0002	0.0008	<0.0002	<0.0002	0.0005	<0.0005	<0.0002	<0.0002
	TP10_0.9-1.0	EM2319124	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	TP11_0.0-0.2	EM2319124	<0.0002	<0.0002	<0.0002	0.0026	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	TP11_0.4-0.5	EM2319124	<0.0002	<0.0002	<0.0002	0.0243	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	TP11_0.9-1.0	EM2319124	<0.0002	<0.0002	<0.0002	0.0030	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	TP12_0.0-0.2	EM2319124	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	TP12_0.6-0.7	EM2319124	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	TP12_1.9-2.0	EM2319124	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	QC3	EM2319124	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	TP14_0.0-0.2	EM2319124	<0.0002	<0.0002	<0.0002	0.0115	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	0.0003	<0.0002	<0.0005	<0.0002	<0.0002
	TP14_0.4-0.5	EM2319124	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	TP14_0.9-1.0	EM2319124	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	TP15_0.0-0.2	EM2319124	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	0.0004	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	TP15_0.6-0.7	EM2319124	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	TP15_1.4-1.5	EM2319124	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
25 Oct 2023	TP16_0-0.1	EM2319124	0.0219	<0.0002	0.0014	0.0198	0.0259	0.0361	0.004	<0.0002	<0.0002	0.0068	0.0633	<0.0002	0.0012	0.0140	<0.0005	<0.0002	<0.0002
	TP16_0.9-1.0	EM2319124	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	TP16_1.9-2.0	EM2319124	<0.0002	<0.0002	<0.0002	0.0012	<0.0002	0.0009	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	QC4	EM2319124	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	0.0005	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
24 Oct 2023	TP17_0.0-0.2	EM2319124	<0.0002	<0.0002	<0.0002	0.0459	<0.0002	0.0007	<0.001	0.0005	<0.0002	<0.0002	<0.0002	0.0008	0.0003	<0.0002	<0.0005	<0.0002	<0.0002
	TP17_0.9-1.0	EM2319124	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	0.0010	<0.0002	<0.0002	0.0003	<0.0005	<0.0002	<0.0002
	TP17_1.9-2.0	EM2319124	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	TP18_0.0-0.2	EM2319124	<0.0002	<0.0002	<0.0002	0.0009	<0.0002	0.0004	<0.001	<0.0002	<0.0002	0.0002	0.0009	<0.0002	<0.0002	0.0005	<0.0005	<0.0002	<0.0002
	TP18_0.9-1.0	EM2319124	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002

			PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
			Perfluorobutane sulfonic acid (PFBS)	Perfluorodecanesulfonic acid (PFDS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluorobutanoic acid (PFBA)	Perfluorodecanoic acid (PFDA)	Perfluorododecanoic acid (PFDoDA)	Perfluoroheptanoic acid (PFHpA)	Perfluorohexanoic acid (PFHxA)	Perfluorononanoic acid (PFNA)	Perfluorooctanoic acid (PFOA)	Perfluoropentanoic acid (PFPeA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL			0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005	0.0002	0.0002
PFAS NEMP 2.0 2020 Ecological direct exposure						1									10				
PFAS NEMP 2.0 2020 Ecological indirect exposure – Developed sites						0.14[#1]													
PFAS NEMP 2.0 2020 Ecological indirect exposure – Undeveloped sites						0.01													
PFAS NEMP 2.0 2020 Residential w/ min opportunities for soil access (HIL B)						2		2							20				
SA MFS Site Specific Criteria - Metropolitan (Staffed)						14		14							50				
	TP18_1.4-1.5	EM2319124	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	TP22_0.0-0.2	EM2319124	0.0027	0.0009	0.0006	0.0550	0.0007	0.0023	0.002	<0.0002	<0.0002	<0.0002	0.0082	<0.0002	0.0004	0.0036	<0.0005	<0.0002	<0.0002
	TP22_0.9-1.0	EM2319124	<0.0002	<0.0002	<0.0002	0.0081	<0.0002	0.0018	<0.001	<0.0002	<0.0002	<0.0002	0.0018	<0.0002	0.0003	0.0027	<0.0005	<0.0002	<0.0002
	TP22_1.4-1.5	EM2319124	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	TP23_0-0.2	EM2319124	0.0037	<0.0002	0.0004	0.0163	0.0020	0.0097	0.003	<0.0002	<0.0002	0.0022	0.0270	<0.0002	0.0028	0.0084	<0.0005	<0.0002	<0.0002
	TP23_0.3-0.4	EM2319124	0.0007	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.001	<0.0002	<0.0002	0.0004	0.0034	<0.0002	<0.0002	0.0008	<0.0005	<0.0002	<0.0002
	TP23_0.9-1.0	EM2319124	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	0.0008	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
	QC2	EM2319124	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	0.0008	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
25 Oct 2023	SD03	EM2319031	<0.0002	<0.0002	<0.0002	0.0097	<0.0002	0.0010	<0.001	0.0004	0.0007	<0.0002	0.0006	<0.0002	<0.0002	0.0009	<0.0005	0.0005	0.0004
	SD03	EM2319031	<0.0005[#3]	<0.0005[#3]	<0.0005[#3]	0.0089	<0.0005[#3]	0.0006	<0.002[#3]	<0.0005[#3]	0.0010	<0.0005[#3]	<0.0006[#3]	<0.0005[#3]	<0.0005[#3]	<0.0006[#3]	<0.0012[#3]	<0.0005[#3]	<0.0005[#3]
	SS01	EM2319031	0.0007	<0.0002	<0.0002	0.0014	0.0009	0.0044	<0.001	<0.0002	<0.0002	0.0002	0.0016	<0.0002	0.0004	0.0002	<0.0005	<0.0002	<0.0002
	SS02	EM2319031	0.0150	<0.0002	0.0019	0.0245	0.0146	0.0618	0.004	<0.0002	<0.0002	0.0031	0.0418	<0.0002	0.0040	0.0089	<0.0005	<0.0002	<0.0002
22 Jan 2019	Angle_1	210445	-	-	-	0.057	-	0.013	-	-	-	-	-	-	0.0024	-	-	-	-
	Angle_2	210445	-	-	-	0.055	-	0.0021	-	-	-	-	-	-	0.0007	-	-	-	-
25 Jan 2019	TRAIN_1	210445	-	-	-	0.0067	-	<0.0001	-	-	-	-	-	-	0.0004	-	-	-	-
	TRAIN_2	210445	-	-	-	0.21	-	0.016	-	-	-	-	-	-	0.0077	-	-	-	-

Comments
#1 This is the higher criterion for (the existing ecological indirect exposure) intensely developed sites with no secondary consumers and minimal potential for indirect ecological exposure. For indicative purposes only.
#2 If the concentration of PFHxS > PFOS this guideline value needs to be adjusted accordingly. Please refer to Section 8.5.2.1 of the PFAS NEMP 2.0 guideline for further information
#3 Reported Analyte LOR is higher than Requested Analyte LOR

Environmental Standards
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Ecological direct exposure
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Ecological indirect exposure
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Ecological indirect exposure – Developed sites
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Residential w/ min opportunities for soil access (HIL B)
28/06/2023, SA MFS Site Specific Criteria - Metropolitan (Staffed)

			PFAS - Perfluoroalkyl Sulfonamide							PFAS - Fluorotelomer Sulfonic Acids				PFAS - Sums			
			Perfluorobutane sulfonic acid (PFBS)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-Methyl perfluorooctane sulfonamidoethanol (MEFOSE)	Perfluorooctane sulfonamide (FOSA)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	PFAS (Sum of Total)	PFAS (Sum of Total)(WA DER List)	Sum of PFHxS and PFOS	Sum of US EPA PFAS (PFOS+PFOA)
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL			0.0002	0.0005	0.0002	0.0005	0.0005	0.0002	0.0005	0.0002	0.0005	0.0005	0.0005	0.0005	0.0002	0.0002	0.0002	0.0002
PFAS NEMP 2.0 2020 Ecological direct exposure																		
PFAS NEMP 2.0 2020 Ecological indirect exposure – Developed sites																		
PFAS NEMP 2.0 2020 Ecological indirect exposure – Undeveloped sites																		
PFAS NEMP 2.0 2020 Residential w/ min opportunities for soil access (HIL B)																	2[#2]	
SA MFS Site Specific Criteria - Metropolitan (Staffed)																	14	
Date	**Field ID**	**Lab Report Number**																
23 Oct 2023	BH01_0.2-0.3	EM2319031	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0513	0.0506	0.0502	-
	FD02	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0195	0.0158	0.0149	-
	BH01_0.6-0.7	EM2319031	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0044	0.0044	0.0040	-
	BH01_1.3-1.4	EM2319031	0.0003	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0079	0.0075	0.0067	-
	BH02_0.08-0.2	EM2319031	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0010	0.0010	0.0010	-
	BH02_0.9-1.0	EM2319031	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0030	0.0030	0.0030	-
	BH03_0.01-0.3	EM2319031	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0073	0.0073	0.0073	-
	FD03	EM2319124	0.0003	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0207	0.0198	0.0183	-
	BH03_0.4-0.5	EM2319031	0.0006	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0304	0.0294	0.0268	-
	BH03_1.2-1.3	EM2319031	0.0003	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0093	0.0093	0.0082	-
	BH04_0.08-0.3	EM2319031	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0018	<0.0005	<0.0005	0.0053	0.0381	0.363	0.358	0.314	-
	BH04_0.6-0.7	EM2319031	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	0.0074	<0.0005	0.164	0.163	0.153	-
	BH04_1.4-1.5	EM2319031	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	0.0020	<0.0005	0.152	0.148	0.137	-
	BH04_PAVER	EM2319031	0.0006	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	0.0036	<0.0005	0.0199	0.0191	0.0117	-
	FD01	EM2319124	0.0009	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	0.0069	0.0027	0.0407	0.0389	0.0238	-
	BH05_0.3-0.4	EM2319031	0.0003	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0060	0.0060	0.0051	-
	BH06_0.0-0.1	EM2319031	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0075	0.0072	0.0072	-
	BH06_0.4-0.5	EM2319031	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0781	0.0770	0.0744	-
	BH07_0.08-0.18	EM2319031	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0006	0.0006	0.0006	-
	BH07_0.9-1.0	EM2319031	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0009	0.0009	0.0004	-
	BH07_2.4-2.5	EM2319031	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0024	0.0024	0.0024	-
	BH07_PAVER	EM2319031	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	-
	BH08_0.08-0.15	EM2319031	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	0.0026	0.0054	0.0054	0.0028	-
	BH08_0.2-0.3	EM2319031	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	0.0012	0.0050	0.0050	0.0038	-
	BH08_1.9-2.0	EM2319031	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	0.0005	<0.0002	-
17 Jan 2024	BH09_0.0-0.1	EM2400894	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	-
	BH09_0.4-0.5	EM2400894	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0074	0.0072	0.0069	-
	BH10_0.0-0.1	EM2400894	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	-
	BH10_0.2-0.3	EM2400894	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0013	0.0013	0.0013	-
	BH11_0.0-0.1	EM2400894	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	-
	BH11_0.2-0.3	EM2400894	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	-
	BH12_0.0-0.1	EM2400894	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	-
	BH12_0.9-1.0	EM2400894	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	-
	FD06	EM2400894	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	-
24 Oct 2023	MW01_0.01-0.1	EM2319031	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0093	0.0093	0.0093	-
	MW01_0.4-0.5	EM2319031	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0140	0.0136	0.0112	-
	MW01_1.8-1.9	EM2319031	0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0045	0.0043	0.0037	-
	MW02_0.3-0.4	EM2319031	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0003	0.0003	0.0003	-
	FD04	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	-
	MW02_0.5-0.6	EM2319031	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	-
	MW03_0-0.1	EM2319031	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0107	0.0107	0.0103	-
	MW03_0.3-0.4	EM2319031	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0117	0.0115	0.0089	-
	MW03_1.4-1.5	EM2319031	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	-
	MW04_0.2-0.3	EM2319031	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0113	0.0113	0.0068	-
	FD05	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0111	0.0111	0.0060	-
	MW04_0.75-0.85	EM2319031	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	-
	MW04_2.1-2.2	EM2319031	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	-
	MW05_0.08-0.12	EM2319031	<0.0002	<0.0005	0.0017	<0.0005	<0.0005	<0.0002	<0.0005	0.0002	0.0005	<0.0005	<0.0005	0.0008	0.0376	0.0328	0.0320	-
	MW05_1.4-1.5	EM2319031	0.0003	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0365	0.0339	0.0170	-
	MW05_3.4-3.5	EM2319031	0.0010	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	0.0008	<0.0005	0.0255	0.0240	0.0182	-
	MW05_PAVER	EM2319031	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0020	0.0020	0.0018	-

			PFAS - Perfluoroalkyl Sulfonamide							PFAS - Fluorotelomer Sulfonic Acids				PFAS - Sums			
		Perfluorobutane sulfonic acid (PFBS)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-Methyl perfluorooctane sulfonamidoethanol (MEFOSE)	Perfluorooctane sulfonamide (FOSA)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	PFAS (Sum of Total)	PFAS (Sum of Total)(WA DER List)	Sum of PFHxS and PFOS	Sum of US EPA PFAS (PFOS+PFOA)
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		0.0002	0.0005	0.0002	0.0005	0.0005	0.0002	0.0005	0.0002	0.0005	0.0005	0.0005	0.0005	0.0002	0.0002	0.0002	0.0002
PFAS NEMP 2.0 2020 Ecological direct exposure																	
PFAS NEMP 2.0 2020 Ecological indirect exposure – Developed sites																	
PFAS NEMP 2.0 2020 Ecological indirect exposure – Undeveloped sites																	
PFAS NEMP 2.0 2020 Residential w/ min opportunities for soil access (HIL B)																2[#2]	
SA MFS Site Specific Criteria - Metropolitan (Staffed)																14	
	TP1_0-0.2	EM2319031	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0017	0.0017	0.0014	-
	TP1_0.4-0.5	EM2319031	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0010	0.0010	0.0003	-
	TP1_0.9-1.0	EM2319031	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0002	0.0002	0.0002	-
	TP2_0-0.2	EM2319031	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0004	0.0004	0.0004	-
	TP2_0.4-0.5	EM2319031	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	-
	TP2_0.9-1.0	EM2319031	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	-
	TP3_0.0-0.2	EM2319031	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0024	0.0024	0.0024	-
	TP3_0.4-0.5	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	-
	TP4_0.0-0.2	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.108	0.106	0.105	-
	QC1	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.141	0.139	0.137	-
	TP4_0.9-1.0	EM2319124	0.0007	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0075	0.0068	0.0035	-
	TP4_1.9-2.0	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0011	0.0011	0.0011	-
	TP5_0.0-0.2	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	0.0006	<0.0005	<0.0005	<0.0005	0.0174	0.0149	0.0069	-
	TP5_0.4-0.5	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0024	0.0024	0.0004	-
	TP5_1.4-1.5	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	-
	TP6_0.0-0.2	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0018	0.0018	0.0018	-
	TP6_0.4-0.5	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0089	0.0089	0.0087	-
	TP6_0.9-1.0	EM2319124	0.0011	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0076	0.0065	0.0039	-
	TP7_0.0-0.2	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0175	0.0151	0.0138	-
	TP7_1.4-1.5	EM2319124	0.0024	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0219	0.0187	0.0050	-
	TP7_1.9-2.0	EM2319124	0.0006	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0022	0.0019	0.0011	-
	TP8_0.0-0.2	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0531	0.0527	0.0527	-
	TP8_0.4-0.5	EM2319124	0.0004	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0067	0.0064	0.0048	-
	TP8_0.9-1.0	EM2319124	0.0008	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0086	0.0074	0.0040	-
	TP9_0.0-0.1	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0021	0.0021	0.0021	-
	TP9_0.4-0.5	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	-
	TP9_0.9-1.0	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	-
	TP10_0.0-0.2	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0035	0.0033	0.0031	-
	TP10_0.5-0.6	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0017	0.0017	0.0004	-
	TP10_0.9-1.0	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	-
	TP11_0.0-0.2	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0026	0.0026	0.0026	-
	TP11_0.4-0.5	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0243	0.0243	0.0243	-
	TP11_0.9-1.0	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0030	0.0030	0.0030	-
	TP12_0.0-0.2	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	-
	TP12_0.6-0.7	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	-
	TP12_1.9-2.0	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	-
	QC3	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	-
	TP14_0.0-0.2	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0120	0.0118	0.0115	-
	TP14_0.4-0.5	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	-
	TP14_0.9-1.0	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	-
	TP15_0.0-0.2	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0010	0.0010	0.0010	-
	TP15_0.6-0.7	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	-
	TP15_1.4-1.5	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	-
25 Oct 2023	TP16_0-0.1	EM2319124	0.0219	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.194	0.167	0.0559	-
	TP16_0.9-1.0	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	-
	TP16_1.9-2.0	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0023	0.0023	0.0021	-
	QC4	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0011	0.0011	0.0011	-
24 Oct 2023	TP17_0.0-0.2	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0482	0.0469	0.0466	-
	TP17_0.9-1.0	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0013	0.0013	<0.0002	-
	TP17_1.9-2.0	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	-
	TP18_0.0-0.2	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	0.0019	<0.0005	0.0048	0.0048	0.0013	-
	TP18_0.9-1.0	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	-

				PFAS - Perfluoroalkyl Sulfonamide								PFAS - Fluorotelomer Sulfonic Acids				PFAS - Sums			
			Perfluorobutane sulfonic acid (PFBS)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-Methyl perfluorooctane sulfonamidoethanol (MEFOSE)	Perfluorooctane sulfonamide (FOSA)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	PFAS (Sum of Total)	PFAS (Sum of Total)(WA DER List)	Sum of PFHxS and PFOS	Sum of US EPA PFAS (PFOS+PFOA)
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL			0.0002	0.0005	0.0002	0.0005	0.0005	0.0002	0.0005	0.0002	0.0005	0.0005	0.0005	0.0005	0.0002	0.0002	0.0002	0.0002
PFAS NEMP 2.0 2020 Ecological direct exposure																		
PFAS NEMP 2.0 2020 Ecological indirect exposure – Developed sites																		
PFAS NEMP 2.0 2020 Ecological indirect exposure – Undeveloped sites																		
PFAS NEMP 2.0 2020 Residential w/ min opportunities for soil access (HIL B)																	2[#2]	
SA MFS Site Specific Criteria - Metropolitan (Staffed)																	14	
	TP18_1.4-1.5	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	-
	TP22_0.0-0.2	EM2319124	0.0027	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0011	<0.0005	<0.0005	<0.0005	<0.0005	0.0775	0.0742	0.0573	-
	TP22_0.9-1.0	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0147	0.0147	0.0099	-
	TP22_1.4-1.5	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	-
	TP23_0-0.2	EM2319124	0.0037	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0755	0.0731	0.0260	-
	TP23_0.3-0.4	EM2319124	0.0007	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0055	0.0055	0.0002	-
	TP23_0.9-1.0	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0008	0.0008	<0.0002	-
	QC2	EM2319124	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0008	0.0008	<0.0002	-
25 Oct 2023	SD03	EM2319031	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0041	0.0007	<0.0005	0.0005	0.0010	0.0205	0.0137	0.0107	-
	SD03	EM2319031	<0.0005[#3]	<0.0012[#3]	<0.0005[#3]	<0.0012[#3]	<0.0012[#3]	<0.0005[#3]	<0.0012[#3]	0.0045	<0.0015[#3]	<0.0012[#3]	<0.0012[#3]	<0.0012[#3]	0.0150	0.0095	0.0095	-
	SS01	EM2319031	0.0007	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0098	0.0089	0.0058	-
	SS02	EM2319031	0.0150	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.180	0.163	0.0863	-
22 Jan 2019	Angle_1	210445	-	-	-	-	-	-	-	-	-	-	0.0008	0.0005	0.074	-	0.07	0.059
	Angle_2	210445	-	-	-	-	-	-	-	-	-	-	0.0069	0.0055	0.07	-	0.057	0.056
25 Jan 2019	TRAIN_1	210445	-	-	-	-	-	-	-	-	-	-	0.0002	0.0004	0.0078	-	0.0067	0.0071
	TRAIN_2	210445	-	-	-	-	-	-	-	-	-	-	0.02	0.26	0.51	-	0.23	0.22

Comments

#1 This is the higher criterion for (the existing ecological indirect exposure) intensely developed si
#2 If the concentration of PFHxS > PFOS this guideline value needs to be adjusted accordingly. F
#3 Reported Analyte LOR is higher than Requested Analyte LOR

Environmental Standards

HEPA, Jan 2020, PFAS NEMP 2.0 2020 Ecological direct exposure
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Ecological indirect exposure
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Ecological indirect exposure – Developed sites
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Residential w/ min opportunities for soil access (HIL B)
28/06/2023, SA MFS Site Specific Criteria - Metropolitan (Staffed)

Table 2
Groundwater Analytical Results

MFS
Angle Park MFS
MFS Angle Park DSI

		PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids											PFAS - Perfluoroalkyl	
		Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	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)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL		0.02	0.02	0.01	0.02	0.01	0.02	0.1	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.05	0.02	0.05
PFAS NEMP 2.0 2020 Marine and Freshwater - 99% - high conservation value systems						0.00023						19								
PFAS NEMP 2.0 2020 Recreational Water				2		2						10								
Human Health – Recreational Water (domestic)				0.7		0.7						5.6								
Date	**Field ID**																			
02 Nov 2023	MW01	0.02	0.03	0.28	0.04	1.52	<0.02	<0.1	0.04	0.05	0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05
	MW02	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05
	MW03	0.05	0.04	0.18	<0.02	0.02	<0.02	<0.1	0.14	0.16	0.03	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05
	MW04	0.03	<0.02	0.07	<0.02	<0.01	<0.02	<0.1	0.02	0.05	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05
	MW05	5.82	5.95	43.1	2.55	44.4	0.03	0.5	3.27	14.0	1.72	2.29	0.03	<0.02	<0.02	<0.02	<0.02	<0.05	0.15	<0.05

Environmental Standards
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Freshwater - 99% - high conservation value systems
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Marine - 99% - high conservation value systems
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Recreational Water
The NHMRC 2008 Guidelines for Managing Risks in Recreational Water (10 times the current drinking water guideline value)

Table 2
Groundwater Analytical Results

		PFAS - Perfluoroalkyl Sulfonamide					PFAS - Fluorotelomer Sulfonic Acids				PFAS - Sums		
		N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-Methyl perfluorooctane sulfonamidoethanol (MEFOSE)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	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)	Sum of PFHxS and PFOS	PFAS (Sum of Total)	PFAS (Sum of Total)(WA DER List)
		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	0.02	0.05	0.05	0.02	0.05	0.05	0.05	0.05	0.01	0.01	0.01
PFAS NEMP 2.0 2020 Marine and Freshwater - 99% - high conservation value systems													
PFAS NEMP 2.0 2020 Recreational Water											2		
Human Health – Recreational Water (domestic)											0.7		
Date	**Field ID**												
02 Nov 2023	MW01	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	1.80	2.04	1.97
	MW02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
	MW03	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	0.20	0.62	0.58
	MW04	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	0.07	0.17	0.17
	MW05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	5.67	0.26	<0.05	87.5	130	121

Environmental Standards
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Freshwater - 99% - high conservatio
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Marine - 99% - high conservation val
HEPA, Jan 2020, PFAS NEMP 2.0 2020 Recreational Water
The NHMRC 2008 Guidelines for Managing Risks in Recreational Water (10

Table 3
Soil RPD Results

MFS
Angle Park MFS
MFS Angle Park DSI

							PFAS - Perfluoroalkyl Sulfonic Acids							PFAS - Perfluoroalkyl Carboxylic Acids					
							Perfluoropropanesulfonic acid (PFPrS)	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecanesulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)
							mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL							0.005	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.001	0.0002	0.0002	0.0002	0.0002	0.0002
Location Code	**Date**	**Field ID**	**Matrix Type**	**Sample Type**	**Lab Report Number**														
BH01	23 Oct 2023	BH01_0.2-0.3	Soil	Normal	EM2319031	-	<0.0002	<0.0002	0.0003	<0.0002	0.0499	<0.0002	<0.001	0.0002	0.0002	<0.0002	<0.0002	0.0005
	23 Oct 2023	FD02	Soil	Field_D	EM2319124	-	<0.0002	<0.0002	0.0005	<0.0002	0.0144	<0.0002	<0.001	0.0005	0.0004	<0.0002	<0.0002	0.0003
RPD						-	0	0	**50**	0	**110**	0	0	**86**	**67**	0	0	**50**
BH01	23 Oct 2023	BH01_0.2-0.3	Soil	Normal	EM2319031	-	<0.0002	<0.0002	0.0003	<0.0002	0.0499	<0.0002	<0.001	0.0002	0.0002	<0.0002	<0.0002	0.0005
	23 Oct 2023	FS02	Soil	Interlab_D	1040245	<0.005	<0.005	<0.005	<0.005	<0.005	0.027	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
RPD						-	0	0	0	0	**60**	0	0	0	0	0	0	0
BH03	23 Oct 2023	BH03_0.01-0.3	Soil	Normal	EM2319031	-	<0.0002	<0.0002	<0.0002	<0.0002	0.0073	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	23 Oct 2023	FD03	Soil	Field_D	EM2319124	-	0.0003	0.0003	0.0056	0.0006	0.0127	<0.0002	<0.001	0.0002	0.0006	<0.0002	0.0004	<0.0002
RPD						-	-	-	-	-	**54**	0	0	0	-	0	-	0
BH03	23 Oct 2023	BH03_0.01-0.3	Soil	Normal	EM2319031	-	<0.0002	<0.0002	<0.0002	<0.0002	0.0073	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	23 Oct 2023	FS03	Soil	Interlab_D	1040245	<0.005	<0.005	<0.005	<0.005	<0.005	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
RPD						-	0	0	0	0	**31**	0	0	0	0	0	0	0
BH04	23 Oct 2023	BH04_PAVER	Soil	Normal	EM2319031	-	0.0006	0.0005	0.0048	0.0003	0.0069	<0.0002	<0.001	0.0005	0.0021	0.0002	0.0004	<0.0002
	23 Oct 2023	FD01	Soil	Field_D	EM2319124	-	0.0009	0.0012	0.0070	0.0006	0.0168	<0.0002	<0.001	0.0009	0.0028	0.0004	0.0005	<0.0002
RPD						-	**40**	**82**	**37**	**67**	**84**	0	0	**57**	29	**67**	22	0
BH04	23 Oct 2023	BH04_PAVER	Soil	Normal	EM2319031	-	0.0006	0.0005	0.0048	0.0003	0.0069	<0.0002	<0.001	0.0005	0.0021	0.0002	0.0004	<0.0002
	23 Oct 2023	FS01	Soil	Interlab_D	1040245	<0.005	<0.005	<0.005	0.0078	<0.005	0.032	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
RPD						-	0	0	**48**	0	**129**	0	0	0	0	0	0	0
MW02	24 Oct 2023	MW02_0.3-0.4	Soil	Normal	EM2319031	-	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	24 Oct 2023	FD04	Soil	Field_D	EM2319124	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
RPD						-	0	0	0	0	-	0	0	0	0	0	0	0
MW02	24 Oct 2023	MW02_0.3-0.4	Soil	Normal	EM2319031	-	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	23 Oct 2023	FS04	Soil	Interlab_D	1040245	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
RPD						-	0	0	0	0	0	0	0	0	0	0	0	0
MW04	24 Oct 2023	MW04_0.2-0.3	Soil	Normal	EM2319031	-	<0.0002	<0.0002	0.0039	<0.0002	0.0029	<0.0002	<0.001	<0.0002	0.0005	0.0003	0.0037	<0.0002
	24 Oct 2023	FD05	Soil	Field_D	EM2319124	-	<0.0002	<0.0002	0.0042	<0.0002	0.0018	<0.0002	<0.001	<0.0002	0.0007	0.0004	0.0040	<0.0002
RPD						-	0	0	7	0	**47**	0	0	0	**33**	29	8	0
MW04	24 Oct 2023	MW04_0.2-0.3	Soil	Normal	EM2319031	-	<0.0002	<0.0002	0.0039	<0.0002	0.0029	<0.0002	<0.001	<0.0002	0.0005	0.0003	0.0037	<0.0002
	23 Oct 2023	FS05	Soil	Interlab_D	1040245	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
RPD						-	0	0	0	0	0	0	0	0	0	0	0	0
TP12	24 Oct 2023	TP12_1.9-2.0	Soil	Normal	EM2319124	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	24 Oct 2023	QC3	Soil	Field_D	EM2319124	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
RPD						-	0	0	0	0	0	0	0	0	0	0	0	0
TP12	24 Oct 2023	TP12_1.9-2.0	Soil	Normal	EM2319124	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	24 Oct 2023	QC3A	Soil	Interlab_D	1040245	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
RPD						-	0	0	0	0	0	0	0	0	0	0	0	0
TP23	24 Oct 2023	TP23_0.9-1.0	Soil	Normal	EM2319124	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	0.0008	<0.0002	<0.0002	<0.0002
	24 Oct 2023	QC2	Soil	Field_D	EM2319124	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	0.0008	<0.0002	<0.0002	<0.0002
RPD						-	0	0	0	0	0	0	0	0	0	0	0	0
TP23	24 Oct 2023	TP23_0.9-1.0	Soil	Normal	EM2319124	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	0.0008	<0.0002	<0.0002	<0.0002
	24 Oct 2023	QC2A	Soil	Interlab_D	1040245	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
RPD						-	0	0	0	0	0	0	0	0	0	0	0	0
TP04	24 Oct 2023	TP4_0.0-0.2	Soil	Normal	EM2319124	-	<0.0002	<0.0002	0.0019	0.0007	0.103	0.0002	<0.001	0.0003	0.0003	<0.0002	0.0005	0.0010
		QC1	Soil	Field_D	EM2319124	-	<0.0002	<0.0002	0.0024	0.0009	0.135	0.0003	<0.001	0.0004	0.0004	<0.0002	0.0007	0.0009
RPD						-	0	0	23	25	27	**40**	0	29	29	0	**33**	11
TP04	24 Oct 2023	TP4_0.0-0.2	Soil	Normal	EM2319124	-	<0.0002	<0.0002	0.0019	0.0007	0.103	0.0002	<0.001	0.0003	0.0003	<0.0002	0.0005	0.0010
		QC1A	Soil	Interlab_D	1040245	<0.005	<0.005	<0.005	<0.005	<0.005	0.26	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
RPD						-	0	0	0	0	**87**	0	0	0	0	0	0	0
TP16	25 Oct 2023	TP16_1.9-2.0	Soil	Normal	EM2319124	-	<0.0002	<0.0002	0.0009	<0.0002	0.0012	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	0.0002	<0.0002
	25 Oct 2023	QC4	Soil	Field_D	EM2319124	-	<0.0002	<0.0002	0.0005	<0.0002	0.0006	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
RPD						-	0	0	**57**	0	**67**	0	0	0	0	0	0	0
TP16	25 Oct 2023	TP16_1.9-2.0	Soil	Normal	EM2319124	-	<0.0002	<0.0002	0.0009	<0.0002	0.0012	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	0.0002	<0.0002
	25 Oct 2023	QC4A	Soil	Interlab_D	1040381	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
RPD						-	0	0	0	0	0	0	0	0	0	0	0	0

Table 3
Soil RPD Results

MFS
Angle Park MFS
MFS Angle Park DSI

						PFAS - Perfluoroalkyl Carboxylic Acids					PFAS - Perfluoroalkyl Sulfonamide							Fluorotelom
						Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-Methyl perfluorooctane sulfonamidoethanol (MEFOSE)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL						0.0002	0.0002	0.0002	0.0002	0.0005	0.0002	0.0005	0.0005	0.0002	0.0005	0.0005	0.0002	0.0005
Location Code	**Date**	**Field ID**	**Matrix Type**	**Sample Type**	**Lab Report Number**													
BH01	23 Oct 2023	BH01_0.2-0.3	Soil	Normal	EM2319031	0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005
	23 Oct 2023	FD02	Soil	Field_D	EM2319124	0.0016	0.0006	0.0008	0.0004	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005
RPD						**156**	-	-	-	0	0	0	0	0	0	0	0	0
BH01	23 Oct 2023	BH01_0.2-0.3	Soil	Normal	EM2319031	0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005
	23 Oct 2023	FS02	Soil	Interlab_D	1040245	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005
RPD						0	0	0	0	0	0	0	0	0	0	0	0	0
BH03	23 Oct 2023	BH03_0.01-0.3	Soil	Normal	EM2319031	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005
	23 Oct 2023	FD03	Soil	Field_D	EM2319124	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005
RPD						0	0	0	0	0	0	0	0	0	0	0	0	0
BH03	23 Oct 2023	BH03_0.01-0.3	Soil	Normal	EM2319031	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005
	23 Oct 2023	FS03	Soil	Interlab_D	1040245	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005
RPD						0	0	0	0	0	0	0	0	0	0	0	0	0
BH04	23 Oct 2023	BH04_PAVER	Soil	Normal	EM2319031	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005
	23 Oct 2023	FD01	Soil	Field_D	EM2319124	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005
RPD						0	0	0	0	0	0	0	0	0	0	0	0	0
BH04	23 Oct 2023	BH04_PAVER	Soil	Normal	EM2319031	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005
	23 Oct 2023	FS01	Soil	Interlab_D	1040245	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005
RPD						0	0	0	0	0	0	0	0	0	0	0	0	0
MW02	24 Oct 2023	MW02_0.3-0.4	Soil	Normal	EM2319031	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005
	24 Oct 2023	FD04	Soil	Field_D	EM2319124	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005
RPD						0	0	0	0	0	0	0	0	0	0	0	0	0
MW02	24 Oct 2023	MW02_0.3-0.4	Soil	Normal	EM2319031	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005
	23 Oct 2023	FS04	Soil	Interlab_D	1040245	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005
RPD						0	0	0	0	0	0	0	0	0	0	0	0	0
MW04	24 Oct 2023	MW04_0.2-0.3	Soil	Normal	EM2319031	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005
	24 Oct 2023	FD05	Soil	Field_D	EM2319124	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005
RPD						0	0	0	0	0	0	0	0	0	0	0	0	0
MW04	24 Oct 2023	MW04_0.2-0.3	Soil	Normal	EM2319031	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005
	23 Oct 2023	FS05	Soil	Interlab_D	1040245	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005
RPD						0	0	0	0	0	0	0	0	0	0	0	0	0
TP12	24 Oct 2023	TP12_1.9-2.0	Soil	Normal	EM2319124	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005
	24 Oct 2023	QC3	Soil	Field_D	EM2319124	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005
RPD						0	0	0	0	0	0	0	0	0	0	0	0	0
TP12	24 Oct 2023	TP12_1.9-2.0	Soil	Normal	EM2319124	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005
	24 Oct 2023	QC3A	Soil	Interlab_D	1040245	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005
RPD						0	0	0	0	0	0	0	0	0	0	0	0	0
TP23	24 Oct 2023	TP23_0.9-1.0	Soil	Normal	EM2319124	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005
	24 Oct 2023	QC2	Soil	Field_D	EM2319124	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005
RPD						0	0	0	0	0	0	0	0	0	0	0	0	0
TP23	24 Oct 2023	TP23_0.9-1.0	Soil	Normal	EM2319124	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005
	24 Oct 2023	QC2A	Soil	Interlab_D	1040245	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005
RPD						0	0	0	0	0	0	0	0	0	0	0	0	0
TP04	24 Oct 2023	TP4_0.0-0.2	Soil	Normal	EM2319124	0.0003	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005
		QC1	Soil	Field_D	EM2319124	0.0003	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005
RPD						0	0	0	0	0	0	0	0	0	0	0	0	0
TP04	24 Oct 2023	TP4_0.0-0.2	Soil	Normal	EM2319124	0.0003	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005
		QC1A	Soil	Interlab_D	1040245	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005
RPD						0	0	0	0	0	0	0	0	0	0	0	0	0
TP16	25 Oct 2023	TP16_1.9-2.0	Soil	Normal	EM2319124	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005
	25 Oct 2023	QC4	Soil	Field_D	EM2319124	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005
RPD						0	0	0	0	0	0	0	0	0	0	0	0	0
TP16	25 Oct 2023	TP16_1.9-2.0	Soil	Normal	EM2319124	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005
	25 Oct 2023	QC4A	Soil	Interlab_D	1040381	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005
RPD						0	0	0	0	0	0	0	0	0	0	0	0	0

						PFAS - Fluorotelomer Sulfonic Acids			PFAS - Sums					PFAS
						6:2 Fluorotelomer Sulfonate (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Sum of PFHxS and PFOS	Sum of US EPA PFAS (PFOS + PFOA)*	PFAS (Sum of Total)	Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	PFAS (Sum of Total)(WA DER List)	Perfluorononane sulfonate (PFNS)
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL						0.0005	0.0005	0.0005	0.0002	0.005	0.0002	0.005	0.0002	0.005
Location Code	**Date**	**Field ID**	**Matrix Type**	**Sample Type**	**Lab Report Number**									
BH01	23 Oct 2023	BH01_0.2-0.3	Soil	Normal	EM2319031	<0.0005	<0.0005	<0.0005	0.0502	-	0.0513	-	0.0506	-
	23 Oct 2023	FD02	Soil	Field_D	EM2319124	<0.0005	<0.0005	<0.0005	0.0149	-	0.0195	-	0.0158	-
RPD						0	0	0	**108**	-	**90**	-	**105**	-
BH01	23 Oct 2023	BH01_0.2-0.3	Soil	Normal	EM2319031	<0.0005	<0.0005	<0.0005	0.0502	-	0.0513	-	0.0506	-
	23 Oct 2023	FS02	Soil	Interlab_D	1040245	<0.01	<0.005	<0.005	0.027	0.027	<0.05	0.027	0.027	<0.005
RPD						0	0	0	**60**	-	-	-	**61**	-
BH03	23 Oct 2023	BH03_0.01-0.3	Soil	Normal	EM2319031	<0.0005	<0.0005	<0.0005	0.0073	-	0.0073	-	0.0073	-
	23 Oct 2023	FD03	Soil	Field_D	EM2319124	<0.0005	<0.0005	<0.0005	0.0183	-	0.0207	-	0.0198	-
RPD						0	0	0	**86**	-	**96**	-	**92**	-
BH03	23 Oct 2023	BH03_0.01-0.3	Soil	Normal	EM2319031	<0.0005	<0.0005	<0.0005	0.0073	-	0.0073	-	0.0073	-
	23 Oct 2023	FS03	Soil	Interlab_D	1040245	<0.01	<0.005	<0.005	0.01	0.01	<0.05	0.01	0.01	<0.005
RPD						0	0	0	**31**	-	0	-	**31**	-
BH04	23 Oct 2023	BH04_PAVER	Soil	Normal	EM2319031	0.0036	<0.0005	<0.0005	0.0117	-	0.0199	-	0.0191	-
	23 Oct 2023	FD01	Soil	Field_D	EM2319124	0.0069	0.0027	<0.0005	0.0238	-	0.0407	-	0.0389	-
RPD						**63**	-	0	**68**	-	**69**	-	**68**	-
BH04	23 Oct 2023	BH04_PAVER	Soil	Normal	EM2319031	0.0036	<0.0005	<0.0005	0.0117	-	0.0199	-	0.0191	-
	23 Oct 2023	FS01	Soil	Interlab_D	1040245	0.019	<0.005	<0.005	0.0398	0.032	0.0588	0.0398	0.0588	<0.005
RPD						**136**	0	0	**109**	-	**99**	-	**102**	-
MW02	24 Oct 2023	MW02_0.3-0.4	Soil	Normal	EM2319031	<0.0005	<0.0005	<0.0005	0.0003	-	0.0003	-	0.0003	-
	24 Oct 2023	FD04	Soil	Field_D	EM2319124	<0.0005	<0.0005	<0.0005	<0.0002	-	<0.0002	-	<0.0002	-
RPD						0	0	0	-	-	-	-	-	-
MW02	24 Oct 2023	MW02_0.3-0.4	Soil	Normal	EM2319031	<0.0005	<0.0005	<0.0005	0.0003	-	0.0003	-	0.0003	-
	23 Oct 2023	FS04	Soil	Interlab_D	1040245	<0.01	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
RPD						0	0	0	0	-	0	-	0	-
MW04	24 Oct 2023	MW04_0.2-0.3	Soil	Normal	EM2319031	<0.0005	<0.0005	<0.0005	0.0068	-	0.0113	-	0.0113	-
	24 Oct 2023	FD05	Soil	Field_D	EM2319124	<0.0005	<0.0005	<0.0005	0.0060	-	0.0111	-	0.0111	-
RPD						0	0	0	12	-	2	-	2	-
MW04	24 Oct 2023	MW04_0.2-0.3	Soil	Normal	EM2319031	<0.0005	<0.0005	<0.0005	0.0068	-	0.0113	-	0.0113	-
	23 Oct 2023	FS05	Soil	Interlab_D	1040245	<0.01	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
RPD						0	0	0	-	-	0	-	12	-
TP12	24 Oct 2023	TP12_1.9-2.0	Soil	Normal	EM2319124	<0.0005	<0.0005	<0.0005	<0.0002	-	<0.0002	-	<0.0002	-
	24 Oct 2023	QC3	Soil	Field_D	EM2319124	<0.0005	<0.0005	<0.0005	<0.0002	-	<0.0002	-	<0.0002	-
RPD						0	0	0	0	-	0	-	0	-
TP12	24 Oct 2023	TP12_1.9-2.0	Soil	Normal	EM2319124	<0.0005	<0.0005	<0.0005	<0.0002	-	<0.0002	-	<0.0002	-
	24 Oct 2023	QC3A	Soil	Interlab_D	1040245	<0.01	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
RPD						0	0	0	0	-	0	-	0	-
TP23	24 Oct 2023	TP23_0.9-1.0	Soil	Normal	EM2319124	<0.0005	<0.0005	<0.0005	<0.0002	-	0.0008	-	0.0008	-
	24 Oct 2023	QC2	Soil	Field_D	EM2319124	<0.0005	<0.0005	<0.0005	<0.0002	-	0.0008	-	0.0008	-
RPD						0	0	0	0	-	0	-	0	-
TP23	24 Oct 2023	TP23_0.9-1.0	Soil	Normal	EM2319124	<0.0005	<0.0005	<0.0005	<0.0002	-	0.0008	-	0.0008	-
	24 Oct 2023	QC2A	Soil	Interlab_D	1040245	<0.01	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
RPD						0	0	0	0	-	0	-	0	-
TP04	24 Oct 2023	TP4_0.0-0.2	Soil	Normal	EM2319124	<0.0005	<0.0005	<0.0005	0.105	-	0.108	-	0.106	-
		QC1	Soil	Field_D	EM2319124	<0.0005	<0.0005	<0.0005	0.137	-	0.141	-	0.139	-
RPD						0	0	0	26	-	27	-	27	-
TP04	24 Oct 2023	TP4_0.0-0.2	Soil	Normal	EM2319124	<0.0005	<0.0005	<0.0005	0.105	-	0.108	-	0.106	-
		QC1A	Soil	Interlab_D	1040245	<0.01	<0.005	<0.005	0.26	0.26	0.26	0.26	0.26	<0.005
RPD						0	0	0	**85**	-	**83**	-	**84**	-
TP16	25 Oct 2023	TP16_1.9-2.0	Soil	Normal	EM2319124	<0.0005	<0.0005	<0.0005	0.0021	-	0.0023	-	0.0023	-
	25 Oct 2023	QC4	Soil	Field_D	EM2319124	<0.0005	<0.0005	<0.0005	0.0011	-	0.0011	-	0.0011	-
RPD						0	0	0	**62**	-	**71**	-	**71**	-
TP16	25 Oct 2023	TP16_1.9-2.0	Soil	Normal	EM2319124	<0.0005	<0.0005	<0.0005	0.0021	-	0.0023	-	0.0023	-
	25 Oct 2023	QC4A	Soil	Interlab_D	1040381	<0.01	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
RPD						0	0	0	0	-	0	-	0	-

Table 4
Groundwater RPD Results

MFS
Angle Park MFS
MFS Angle Park DSI

						PFAS - Perfluoroalkyl Sulfonic Acids							PFAS - Perfluoroalkyl Carboxylic Acids					
						Perfluoropropanesulfonic acid (PFPrS)	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecanesulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)
						µg/L	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	0.05	0.01	0.01	0.01	0.01	0.01
Location Code	**Date**	**Field ID**	**Matrix Type**	**Sample Type**	**Lab Report Number**													
MW05	02 Nov 2023	MW05	Water	Normal	EM2319782	-	5.82	5.95	43.1	2.55	44.4	0.03	0.5	3.27	14.0	1.72	2.29	0.03
	02 Nov 2023	FD01	Water	Field_D	EM2319782	-	6.06	6.40	44.2	2.80	46.0	0.03	0.6	3.56	14.9	1.83	2.29	0.02
RPD						-	4	7	3	9	4	0	18	8	6	6	0	**40**
MW05	02 Nov 2023	MW05	Water	Normal	EM2319782	-	5.82	5.95	43.1	2.55	44.4	0.03	0.5	3.27	14.0	1.72	2.29	0.03
	02 Nov 2023	FS01	Water	Interlab_D	1041521	2.5	6.1	6.2	45	2.2	50	<0.1	1.3	3.5	12	1.5	2.3	0.02
RPD						-	5	4	4	15	12	0	**89**	7	15	14	0	**40**

***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: 30 (1 - 10 x EQL); 30 (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**

Table 4
Groundwater RPD Results

MFS
Angle Park MFS
MFS Angle Park DSI

						PFAS - Perfluoroalkyl Carboxylic Acids					PFAS - Perfluoroalkyl Sulfonamide							Fluorotelom
						Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-Methyl perfluorooctane sulfonamidoethanol (MEFOSE)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL						0.01	0.01	0.01	0.01	0.01	0.02	0.05	0.05	0.02	0.05	0.05	0.02	0.01
Location Code	**Date**	**Field ID**	**Matrix Type**	**Sample Type**	**Lab Report Number**													
MW05	02 Nov 2023	MW05	Water	Normal	EM2319782	<0.02	<0.02	<0.02	<0.02	<0.05	0.15	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	02 Nov 2023	FD01	Water	Field_D	EM2319782	<0.02	<0.02	<0.02	<0.02	<0.05	0.14	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
RPD						0	0	0	0	0	7	0	0	0	0	0	0	0
MW05	02 Nov 2023	MW05	Water	Normal	EM2319782	<0.02	<0.02	<0.02	<0.02	<0.05	0.15	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05
	02 Nov 2023	FS01	Water	Interlab_D	1041521	<0.01	<0.01	<0.01	<0.01	<0.01	0.13	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01
RPD						0	0	0	0	0	14	0	0	0	0	0	0	0

***RPDs have only been considered where a concentration is greater than 1 times the EQL.**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 30 (1 - 10 x EQL); 30 (10 - 30**
*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to th**

						PFAS - Fluorotelomer Sulfonic Acids			PFAS - Sums					PFAS
						6:2 Fluorotelomer Sulfonate (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Sum of PFHxS and PFOS	Sum of US EPA PFAS (PFOS + PFOA)*	PFAS (Sum of Total)	Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	PFAS (Sum of Total)(WA DER List)	Perfluorononane sulfonate (PFNS)
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL						0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Location Code	**Date**	**Field ID**	**Matrix Type**	**Sample Type**	**Lab Report Number**									
MW05	02 Nov 2023	MW05	Water	Normal	EM2319782	5.67	0.26	<0.05	87.5	-	130	-	121	-
	02 Nov 2023	FD01	Water	Field_D	EM2319782	5.11	0.28	<0.05	90.2	-	134	-	125	-
RPD						10	7	0	3	-	3	-	3	-
MW05	02 Nov 2023	MW05	Water	Normal	EM2319782	5.67	0.26	<0.05	87.5	-	130	-	121	-
	02 Nov 2023	FS01	Water	Interlab_D	1041521	5.2	0.19	<0.01	95	52.3	138.28	97.3	127.09	0.14
RPD						9	**31**	0	8	-	6	-	5	-

***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: 30 (1 - 10 x EQL); 30 (10 - 30**
*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to th**

Table 5
Field Blank Results

			PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids											PFAS - Perfluoroalkyl Sulfonamide	
			Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	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)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL			0.02	0.02	0.01	0.02	0.01	0.02	0.1	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.02	0.05
Date	**Matrix Type**	**Lab Report Number**																				
23 Oct 2023	Water	EM2319124	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05
24 Oct 2023	Water	EM2319124	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05
			<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05
25 Oct 2023	Water	EM2319124	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05
02 Nov 2023	Water	EM2319782	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05

Table 5
Field Blank Results

			PFAS - Perfluoroalkyl Sulfonamide					PFAS - Fluorotelomer Sulfonic Acids				PFAS - Sums		
			N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-Methyl perfluorooctane sulfonamidoethanol (MEFOSE)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	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)	Sum of PFHxS and PFOS	PFAS (Sum of Total)	PFAS (Sum of Total)(WA DER List)
			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	0.02	0.05	0.05	0.02	0.05	0.05	0.05	0.05	0.01	0.01	0.01
Date	**Matrix Type**	**Lab Report Number**												
23 Oct 2023	Water	EM2319124	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
24 Oct 2023	Water	EM2319124	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
			<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
25 Oct 2023	Water	EM2319124	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01
02 Nov 2023	Water	EM2319782	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01

Appendices

Appendix A

SA EPA Letter

Environment Protection Authority
GPO Box 2607 Adelaide SA 5001
T (08) 8204 2004
Country areas 1800 623 445

EPA GENI 62917

Krystle Mitchell
Senior Scientific and Environmental Officer
South Australian Metropolitan Fire Service
By Email: Krystle.Mitchell@eso.sa.gov.au

Dear Ms Mitchell,

RE: REVIEW OF SITE CONTAMINATION REPORT – ACTION REQUIRED

Site: Various Metropolitan Fire Service (MFS) Fire Stations, South Australia

Thank you for providing the Environment Protection Authority (EPA) with a copy of the following report:

- *MFS 17 Fire Stations PFAS Risk Profiling*, prepared by GHD and dated 26 October 2022.

The above report documents a desktop risk profiling and prioritisation assessment completed for 17 MFS stations previously identified as containing PFAS contamination, based on limited site sampling completed in 2019 (GHD 2019)[1].

The EPA requests that you submit a plan of proposed works and associated timelines to address the highest risk sites by **30 June 2023**.

If you agree to undertake the above listed works it is requested that you submit written acknowledgement to the EPA stating as such. If you wish to discuss potential alterations to the recommended works or delivery date please contact the EPA as soon as possible.

It is not clear in the above report whether stations where no soil sampling was completed, or where the limited sampling showed no site contamination, were considered as part of the risk screening assessment. The EPA notes that the sampling documented in GHD (2019) was highly limited and may not capture all potential PFAS source areas at a station. The EPA recommends that these stations be risk profiled if not undertaken previously.

Please provide a copy of this letter to your engaged consultant to assist them in developing a scope of works for the relevant sites. Fact sheets relating to your obligations under the *Environment Protection Act 1993* and how to engage a site contamination consultant be found at www.epa.sa.gov.au. If you would like further assistance on this matter please contact Brooke Ryan on (08) 8204 8525 or at brooke.ryan2@sa.gov.au.

Yours sincerely

HCustance
Hannah Custance

PRINCIPAL ADVISER, SITE CONTAMINATION

ENVIRONMENT PROTECTION AUTHORITY

Date: 1 February 2023

Cc: Ben Petticrew, Technical/Project Director – Contamination Assessment and Remediation, GHD (ben.petticrew@ghd.com)

[1] *MFS State Wide Appliance and Station Sampling*, prepared by GHD and dated May 2019.

Appendix B

Photolog

Site Details

Site Name	Angle Park Fire Station
Site Address	456 Grand Junction Road, Angle Park SA 5010
Inspection Date	October 12, 2023 14:00
Inspector (GHD)	Ally Kirkman

Photograph Log

ID	Description	Photograph
1	**Facing:** W **Description:** Site overview from central east boundary facing western boundary. Concrete debris visible on left side of photo.	
2	**Facing:** NW **Description:** Site overview from central east boundary facing northwest corner. Earth mound covered in long grass visible in centre of photo.	

ID	Description	Photograph
3	**Facing:** SW **Description:** Site overview from central east boundary facing southwest corner. Debris visible across centre of photo. SA Power Networks training area visible past tree line in background of photo.	
4	**Facing:** SW **Description:** Overview of site from northeast corner. SA Power Networks training area visible past tree line in background of photo. Tall grass visible across the site.	
5	**Facing:** W **Description:** Northern portion of site from northeast corner. New housing development visible beyond western boundary.	

ID	Description	Photograph
6	**Facing:** S **Description:** Overview of site from central north boundary.	
7	**Facing:** S **Description:** Western portion of site from the northeast corner. Metal poles visible in foreground of photo. SA Power Networks training area visible in background of photo beyond tree line.	
8	**Facing:** E **Description:** Northern portion of site visible from northwest corner. Angle Park Fire Station shed visible on left site of photo. MFS training vehicles visible in background of photo.	

ID	Description	Photograph
9	**Facing: S**E **Description:** Southeast portion of site visible from northwest corner. Centre sign reads 'Borer Test Area'. Stockpiles also visible on left site of photo. MFS training vehicles and SAPN training area visible in background of photo.	
10	**Facing:** S **Description:** Western boundary of site taken from central west boundary. Earth mounds, shrubs and trees visible.	

ID	Description	Photograph
11	**Facing:** N **Description:** Western boundary of site from central west boundary. Concrete brick debris visible in bottom left of photo. Trees visible along western boundary on left side of photo.	
12	**Facing:** E **Description:** Overview of site from central west boundary. Tall grass and small shrubs visible throughout.	
13	**Facing:** NE **Description:** Western side of site. Traffic cone debris visible in centre of photo. Unsealed track visible, this was the only area on the site which was not bare soil.	

ID	Description	Photograph
14	**Facing:** N **Description:** Western portion of site from southwest corner. Tree and shrub vegetation visible along western boundary. Earth mound and woody debris visible on right side of photo.	
15	**Facing:** N **Description:** Western portion of site from southwest corner. Vegetation, earth mound and woody debris visible.	

ID	Description	Photograph
16	**Facing:** W **Description:** Southern boundary of site from central south boundary. SA Power Networks training area visible beyond fenced area on left side of photo.	
17	**Facing:** S **Description:** SA Power Networks training area south of the site from the central south boundary.	
18	**Facing:** N **Description:** Overview of site from central south boundary. Container visible in centre of photo.	

ID	Description	Photograph
19	**Facing:** W **Description:** Southern portion of the site from southeast corner. Concrete debris and container visible.	
20	**Direction:** SW **Description:** South of the site from the southeast corner. SA Power Networks training area beyond fence line and C&D waste visible.	
21	**Direction:** SE **Description:** Earth mound in southern portion of site.	

ID	Description	Photograph
22	**Direction:** North **Description:** Stormwater diversion channel running north south adjacent the west boundary of the site. Grand junction road visible background.	
23	**Direction:** East **Description:** Stormwater pipe discharging into stormwater diversion channel.	
24	**Description:** Test pit TP08 , located in the central portion of the historic training area, with visible refuse, including fire fighter boots (right) and concrete rubble.	

ID	Description	Photograph
25	**Direction:** SE **Description:** Drill rig advancing MW05	
	Direction: S **Description:** Soil sample from BH04, which had reported exceedances in fill, visible bottom right of the core tray and in natural soil taken at 0.6 – 0.7 m bgl, visible bottom left of core tray.	

Appendix C

WaterConnect Results

WaterConnect

Groundwater Data Report

Government of South Australia
Department for Environment and Water

Circle Centre -34.851648,138.557295, Radius 2km

Unit No	Max Depth (m)	Latest Depth (m)	SWL (m)	SWL Date	Yield (L/sec)	Yield Date	TDS (mg/L)	TDS Date	Aquifer	Date	Status	Cased To (m)	Purpose	Obs No	SWL Status	Salinity Status	Permit No
6628-4377	83.06	83.06	0	11/05/1949	0.63	11/05/1949	2256	11/05/1949	Qpah(Q4)								
6628-4378	79.4	79.4	2.13						Qpah								
6628-4379							1622		Qpah								
6628-4380	6.4	6.4							Qpah	13/08/1965	UKN						
6628-4381	5.03	5.03							Qpah	17/08/1965	UKN						
6628-4382	5.03	5.03							Qpah	19/08/1965	UKN						
6628-4388	81.69	81.69							Qpah		ABD						
6628-4390	84.73	84.73							Qpah								
6628-4391	3.3		1.5	01/05/1975			36748	01/05/1975	Qpah		UKN	3.3	OBS				
6628-4392	85.34	85.34	0	21/06/1934	0.63	21/06/1934	2570	21/06/1934	Tomw(T1)		ABD						
6628-4393	85.34	85.34	1.22	21/06/1934	0.51	21/06/1934	2556	21/06/1934	Qpah(Q4)		NL						
6628-4394	85.34	85.34							Qpah(Q4)								
6628-4396			0		0.51				Tomw(T1)								
6628-4397	15		3.85	01/05/1975			51756	01/05/1975	Qpah		UKN	12	OBS				
6628-4398	130.15	130.15	14.8	01/03/1988	17.5	23/01/1957	70842	11/05/1979	Tomw(T1)	23/01/1957		117.37	OBS	PTA064	H	H	
6628-4400	2.44	2.44							Qpah	09/12/1960	UKN	2.44	INV				
6628-4402	105.16	105.16	0	30/08/1935	1.26		4055	30/08/1935	Tomw(T1)								
6628-4403	45.72	45.72					26432	15/11/1935	Qpah								
6628-4404	68.88	68.88							Qpah								
6628-4405	9.22	9.22							Qpah	19/03/1964	ABD						
6628-4406	18.36	18.36							Qpah	24/03/1964	ABD						
6628-4407	9.22	9.22							Qpah	26/03/1964	ABD						
6628-4408	82.6	82.6	0	13/10/1914			3612	15/10/1914	Qpah	01/10/1914							
6628-4409	85.34	85.34	0						Qpah								
6628-4410	16.76	16.76							Qpah	17/06/1960	ABD		DRN				
6628-8603	18.29	18.29	0.76	30/09/1954			44330	30/09/1954	Qpah	03/09/1954	UKN						
6628-8604	18.29	18.29	0.91	30/09/1954			47190	30/09/1954	Qpah	08/09/1954	UKN						
6628-8605	67.06	67.06	0	20/09/1932	1.01	20/09/1932	2584	20/09/1932	Qpah								
6628-8701	3.66	3.66							Qpah	20/12/1960	UKN	3.66					
6628-8705	4.57	4.57							Qpah	20/12/1960	UKN	4.57					
6628-8846	123.46		6.1	01/10/1934	2.27	01/10/1934	2869	06/04/1934	Tomw(T1)	21/01/1932							
6628-8849			1.83	18/07/1934			9380	18/07/1934	Qhck Qpah								
6628-8850							471	16/01/1946	Qpah								
6628-8851									Qpah								
6628-8852	6.25	6.25	1.52	10/02/1961					Qpah	10/02/1961							
6628-8853	19.2	19.2							Qpah	12/01/1965	UKN						

Unit No	Max Depth (m)	Latest Depth (m)	SWL (m)	SWL Date	Yield (L/sec)	Yield Date	TDS (mg/L)	TDS Date	Aquifer	Date	Status	Cased To (m)	Purpose	Obs No	SWL Status	Salinity Status	Permit No
6628-8854	30.48	30.48							Qpah	22/01/1965	UKN						
6628-8855	7.62	7.62	0.91	11/05/1949	0.05	11/05/1949	2790	11/05/1949	Qpah								
6628-8856	3	3	2.74	23/11/1972			4559	23/11/1973	Qpah								
6628-8857	161.54	161.54	4.88	29/01/1935	0.69	29/01/1935	3184	29/01/1935	Tomw(T1)	29/01/1935		126.75					
6628-8858	5.49	5.49	3.35	28/02/1974			4757	28/02/1974	Qpah								
6628-8859	4.57	4.57					2827	28/02/1964	Qpah								
6628-8860	11.89	11.89			1.16	01/01/1946	2815	30/01/1946	Qpah								
6628-8861	3.66	3.66					2241	19/09/1945	Qpah								
6628-8862	7.62	7.62					4085	22/11/1967	Qpah								
6628-8895	27.58	27.58	1.12	25/03/1966	0.25	25/03/1966	3315	25/03/1966	Qpah	25/03/1966	ABD						
6628-8896	15.24	15.24	0.91	14/04/1966	0.25	14/04/1966	5285	14/04/1966	Qpah	14/04/1966	ABD						
6628-8897	52.5	46.8	3.97	05/09/2023	2.5	24/11/1976	3252	24/11/1976	Qpah(Q4)	24/11/1976		52.5	OBS	YAT086	C	N	170
6628-8899	220	220	6.75	11/09/2023	2.53	27/08/1986	2978	21/08/2013	Tomw(T2)	01/10/1976	RHB	208	OBS	YAT053	C	H	94542
6628-8900	12.27	12.27	0.91	31/03/1966	0.25	31/03/1966	1955	31/03/1966	Qpah	31/03/1966	ABD						
6628-8976	50	50							Qpah	15/01/1979		36	INV				3574
6628-10942	8	8							Qpah	29/01/1979		5	INV				5268
6628-10980	205	92.5	5.64	11/09/2023			3536	24/03/1980	Tomw(T1)	08/08/1979	OPR	89	OBS	PTA065	C	H	5719
6628-11478	205	161.5	2.88	11/09/2023			3018	24/03/1980	Tomw(T1)	08/08/1979	OPR	158	OBS	PTA066	C	N	5719
6628-11479	205	201.5	-3.62	11/09/2023			5243	24/03/1980	Tomw(T2)	08/08/1979	OPR	198	OBS	PTA067	C	N	5719
6628-11499	4	4							Qpah	06/09/1980	OPR	4	DRN				7582
6628-11500	4	4							Qpah	06/09/1980	OPR	4	DRN				
6628-11957	9.1	9.1	3	22/04/1982	1.5	22/04/1982	2421	22/04/1982	Qpah	22/04/1982		8.5					10328
6628-12096	9.1	9.1	2	14/12/1982	2	14/12/1982	20990	01/01/1982	Qpah	14/12/1982	BKF						10800
6628-12237	16	16							Qpah	07/07/1982	GEQ	16	INV				
6628-12577	9.1	9.1	2	02/11/1983	1.5	02/11/1983	5109	02/11/1983	Qpah	02/11/1983	OPR	9.1	DOM				13319
6628-12632	6	6					26443	07/09/1983	Qpah	07/09/1983		2	OBS				
6628-12633	6	6					40600	07/09/1983	Qpah	07/09/1983		6	DRN				
6628-12898	6	6							Qhck	01/01/1984	OPR		DOM				13942
6628-12961	10	10	4	26/06/1984			16764	25/06/1984	Qpah	26/06/1984		10					14233
6628-13223	20	20	3	08/02/1985	0.6	08/02/1985	21028	07/02/1985	Qpah	08/02/1985		20					16035
6628-13231	120	106	5.11	17/11/2023	1.15	11/07/1985	3178	03/09/2013	Tomw(T1)	28/02/1985		98	OBS	YAT115	C	H	93722
6628-13276	22	22	3	27/03/1985	1.2	27/03/1985	12023	27/03/1985	Qpah	27/03/1985		21.5					16451
6628-13434	6	6	2.1	02/08/1985					Qpah	02/08/1985	OPR	6	DRN				17153
6628-13508	6	6	2.42	25/06/1985			42070	26/06/1985	Qpah	25/06/1985		6	OBS				94075
6628-13511	6	6	1.45	26/06/1985			42070	26/06/1985	Qpah	26/06/1985		6	OBS				94078
6628-13521	11	11	2.4	05/12/1985	1.5	05/11/1985	2375	05/11/1985	Qpah	05/11/1985		11					17408
6628-13634	216	216	4	02/05/1986	6	02/05/1986	3443	14/01/1998	Tomw(T2)	02/05/1986	OPR	204	IRR				94397
6628-14005	223	0	3.52	14/09/1987	7.5	08/09/1987	3943	14/01/1998	Tomw(T2)	08/09/1987	BKF		IND				396620
6628-14070	11	11	4	29/01/1988	1.25		18182	29/01/1988	Qpah	08/10/1987		11					20285
6628-14213	127	0	9	09/03/1988			2807	07/12/1988	Tomw(T1)	07/12/1987	BKF		IRR				34398
6628-14569	10	10							Qpah	14/02/1984	ABD		INV				
6628-15127	8.1	8.1	2.3	07/12/1989	1.2	18/11/1989	5521	07/12/1989	Qpah	18/11/1989	OPR	8.1	IRR				23546

Unit No	Max Depth (m)	Latest Depth (m)	SWL (m)	SWL Date	Yield (L/sec)	Yield Date	TDS (mg/L)	TDS Date	Aquifer	Date	Status	Cased To (m)	Purpose	Obs No	SWL Status	Salinity Status	Permit No
6628-15639	18	18	4	10/09/1991	2.5	10/09/1991	8663	10/09/1991	Qpah	10/09/1991	OPR	18	RCL				26074
6628-15940	9	9	3	24/03/1992	1.2	12/03/1992	14026	24/03/1992	Qhck	12/03/1992	BKF						26548
6628-16119	12	12	4.5	24/08/1992			11848	24/08/1992	Qpah	08/08/1992	OPR	12	DOM				27950
6628-16189	5.4				0.3	01/12/1992			Qpah			2.15	OBS				28601
6628-16190	5.4				0.3	01/12/1992			Qpah			2.15	OBS				28602
6628-16191	5.3				0.3	01/12/1992			Qpah			2	OBS				28603
6628-16192	5.4				0.3	01/12/1992			Qpah			2.2	OBS				28604
6628-16193	5.4				0.3	02/12/1992			Qpah			2.1	OBS				28605
6628-16287	14.5	14.5	2.5	20/05/2004					Qpah	28/08/1992			OBS				65824
6628-16288	14.5	14.5	2.5	20/05/2004					Qpah	28/08/1992			OBS				65825
6628-16318	18	18					21371	22/01/1993	Qpah	05/01/1993		18	DOM				28753
6628-16320	12	12			1	15/03/1993	4180	05/04/1993	Qpah	15/03/1993		12	DOM				29069
6628-16329	7	7					5462	24/03/1993	Qpah	23/03/1993		7	INV				29190
6628-16426	10.8	10.8	4.5						Qpah	09/11/1992		10.7	OBS				
6628-16427	10.3	10.3	3.7						Qpah	09/11/1992		9.8	OBS				28971
6628-16428	14.4	14.4	3.7						Qpah	10/11/1992		11	OBS				28972
6628-16429	10.8	10.8	3.9						Qpah	11/11/1992		10.8	OBS				28973
6628-16430	10.5	10.5	3.7						Qpah	11/11/1992		8.8	OBS				28974
6628-16549	12	12					6590	24/01/1994	Qpah	22/01/1994		12	DOM				30924
6628-16952	9	0					13420	24/01/1995	Qhck	24/01/1995	ABD		DOM				33846
6628-17034	7.48	7.48							Qpah								
6628-17035	4.49	4.49							Qpah								
6628-17036	9.81	9.81							Qpah								
6628-17098	12	12					4496	11/03/1995	Qpah	11/03/1995		12	DOM				33860
6628-17193	9	9							Qpah	11/10/1990	UKN						
6628-17194	8.4	8.4							Qpah	12/10/1990	UKN						
6628-17195	8.4	8.4							Qpah	16/10/1990	UKN						
6628-17297	5	5							Qpah	20/06/1995		1	INV				35341
6628-17298	5.3	5.3							Qpah	19/06/1995		1.3	INV				35342
6628-17299	5.2	5.2							Qpah	19/06/1995		1.2	INV				35343
6628-17300	5	5							Qpah	19/06/1995		1	INV				35348
6628-17301	5.35	5.35							Qpah	20/06/1995		1.35	INV				35344
6628-17308	5	5							Qpah	20/06/1995		2	INV				35345
6628-17309	5.05	5.05							Qpah	21/06/1995		1.05	INV				35346
6628-17310	5	5							Qpah	20/06/1995		5	INV				35347
6628-17450	9	9					3218	17/11/1995	Qpah	17/11/1995		9	DOM				36225
6628-17497	12	12			1	26/12/1995	14476	26/12/1995	Qpah	26/12/1995		12	DOM				36362
6628-17498	12	12			1	26/12/1995	6418	26/12/1995	Qpah	26/12/1995		12	DOM				36363
6628-17792	14	14			1	01/03/1996	5150	01/03/1996	Qpah	01/03/1996		14	DOM				37094
6628-18045	4	4					1143	17/01/1996	Qpah	15/01/1996		4	OBS				36934
6628-18046	5	5					27703	17/01/1996	Qpah	15/01/1996		5	OBS				36935
6628-18047	6	6					48650	17/01/1996	Qpah	15/01/1996		6	OBS				36936

Unit No	Max Depth (m)	Latest Depth (m)	SWL (m)	SWL Date	Yield (L/sec)	Yield Date	TDS (mg/L)	TDS Date	Aquifer	Date	Status	Cased To (m)	Purpose	Obs No	SWL Status	Salinity Status	Permit No
6628-18054	5	5					9866	17/01/1996	Qpah	15/01/1996		5	OBS				36933
6628-18152	18	18	4	08/01/1997			52529		Qpah	08/01/1997		18	DRN				39658
6628-18274	6	6	2.2	13/03/1997					Qhck	13/03/1997		6	OBS				40499
6628-18275	5.5	5.5	2.2	13/03/1997					Qpah	13/03/1997		5.5	OBS				40520
6628-18276	5.5	5.5	2.2	13/03/1997					Qhck	13/03/1997		5.5	OBS				40521
6628-18277	5.5	5.3	2.4	13/03/1997					Qpah	13/03/1997		5.3	OBS				40522
6628-18278	5.5	5.5	3.6	14/03/1997					Qpah	14/03/1997		5.5	OBS				40523
6628-18279	5.5	5.5	3.6	14/03/1997					Qpah	14/03/1997		5.5	OBS				40524
6628-18299	5	5	2.94	24/05/1996					Qhck	24/05/1996		5	INV				39927
6628-18300	5	5	2.93	24/05/1996					Qhck	24/05/1996		5	INV				40020
6628-18301	5	5	2.95	24/05/1996					Qhck	24/05/1996		5	INV				40021
6628-18302	5	5	2.84	24/05/1996					Qhck	24/05/1996		5	INV				40022
6628-18303	5	5	2.84	30/09/1996					Qhck	30/09/1996		5	INV				40023
6628-18304	5	5	2.84	30/09/1996					Qhck	30/09/1996		5	INV				40024
6628-18325	8	6	2.2	06/11/1996					Qpah	06/11/1996		6	MON				39084
6628-18326	8	6	2.53	06/11/1996					Qpah	06/11/1996		6	MON				39085
6628-18327	6	6	2.53	06/11/1996					Qpah	06/11/1996		6	MON				39086
6628-18527	54	54	5	14/03/1997	3	14/03/1997	76000	17/03/1997	Qpah	14/03/1997		54	DOM				40477
6628-18779	16	15	5.4	17/10/1997			3309	17/10/1997	Qpah	17/10/1997		15	DOM				40277
6628-18848	18	18	5.4	10/02/1998			9113	10/02/1998	Qpah(Q1)	10/02/1998		18	DOM				43809
6628-18931	5.5	5.5							Qpah	11/09/1997		5.5	INV				42474
6628-18932	4	4	1.91	11/09/1997					Qpah	11/09/1997		4	INV				42481
6628-18999	6	6	3.6	23/12/1997					Qpah	23/12/1997		2	INV				43673
6628-19000	6	6	3.6	23/12/1997					Qpah	23/12/1997		2	INV				43688
6628-19001	6	6	3.69	23/12/1997	0.01	23/12/1997			Qpah	23/12/1997		2	INV				43689
6628-19002	6	6	3.8	13/02/1998					Qpah	13/02/1998		1.5	INV				44094
6628-19003	6	6	3.66	13/02/1998					Qpah	13/02/1998		1.5	INV				44109
6628-19004	6	6	3.7	13/02/1998					Qpah	13/02/1998		1.5	INV				44110
6628-19005	6	6	4.17	13/02/1998					Qpah	13/02/1998		1.5	INV				44111
6628-19006	6	6	4.1	13/02/1998					Qpah	13/02/1998		1.5	INV				44112
6628-19007	6	6	4.23	13/02/1998					Qpah	13/02/1998		1.5	INV				44113
6628-19282	6	6	2.2	19/06/1998	0.2	19/06/1998			Qpah	19/06/1998		6	MON				44719
6628-19283	6	6	2	19/06/1998	0.2	14/06/1998			Qpah	19/06/1998		6	MON				44731
6628-19284	6	6	2.3	16/06/1998	0.2	16/06/1998			Qpah	16/06/1998		6	MON				44732
6628-19285	6	6	2.1	16/06/1998	0.2	16/06/1998			Qpah	16/06/1998		6	MON				44967
6628-19286	6	6	2.5	16/06/1998	0.2	16/06/1998			Qpah	16/06/1998		6	MON				44982
6628-19287	6	6	2.2	16/06/1998	0.2	16/06/1998			Qpah	16/06/1998		6	MON				44983
6628-19484	4.6	4.6	2.79	05/01/1999					Qpah	30/12/1998		4.6	MON				47530
6628-19485	4	4	2.73	05/01/1999					Qpah	30/12/1998		4	MON				47531
6628-19486	4	4	2.77	05/01/1999					Qpah	30/12/1998		4	MON				47532
6628-20121	12	12	3.5	24/11/1999	2	24/11/1999	23637	24/11/1999	Qhck	24/11/1999		12	DOM				50422
6628-20233	24	24	5.5	06/06/2000	3.3	06/06/2000	1340	20/12/2000	Qpah(Q3)	06/06/2000	OPR	24	DRN				52708

Unit No	Max Depth (m)	Latest Depth (m)	SWL (m)	SWL Date	Yield (L/sec)	Yield Date	TDS (mg/L)	TDS Date	Aquifer	Date	Status	Cased To (m)	Purpose	Obs No	SWL Status	Salinity Status	Permit No
6628-20234	24	24	5.5	05/06/2000	3.3	05/06/2000	1457	19/12/2000	Qpah(Q3)	05/06/2000	OPR	24	DRN				52709
6628-20496	15	15	6	28/02/2001	0.8	28/02/2001	65280	28/02/2001	Qpah	28/02/2001		15	DOM				54765
6628-20588	29	29	4.5	05/02/2001	3	05/02/2001	1049	28/03/2001	Qpah	05/02/2001	OPR	10	DRN				54204
6628-20611	130	129.5			14	22/02/2001	3041	22/02/2001	Tomw(T1)	22/02/2001		120	IND				52221
6628-20622	10.5	10.5	3	14/07/2001	1	14/07/2001	11507	14/07/2001	Qpah	14/07/2001		10.5	DOM				55212
6628-20689	5	5	3.25	31/10/2001					Qpah	31/10/2001		5	INV				56830
6628-20786	4.9	4.6	1.95	31/10/2001					Qpah	31/10/2001		4.6	INV				56832
6628-20787	5	5	2.62	31/10/2001					Qpah	31/10/2001		5	INV				56831
6628-20908	8	8	3	20/12/2000			2058	26/08/2002	Qpah	20/12/2000		8	DOM				49219
6628-20955	4	4							Qpah	15/01/2002		1	MON				57252
6628-20956	4	4							Qpah	15/01/2002		1	MON				57253
6628-21073	5	5	2	27/09/2002					Qpah	27/09/2002		1.1	INV				59723
6628-21074	4.5	4.5	2	27/09/2002					Qpah	27/09/2002		1.5	INV				59722
6628-21467	6.5	6.5	2.7	26/10/2003	0.3	26/10/2003	1647	10/11/2003	Qpah	26/10/2003		4.5	DOM				63683
6628-21905	5.1	5.1	2.4	16/09/2004					Qpah	16/09/2004		2					101147
6628-21914	5.5	5.5							Qpah	31/08/2004		5.5	MON				100124
6628-21915	5.1	5.1	2.8	31/08/2004					Qpah				MON				100125
6628-21981	156	156	15.5	21/08/2004	10	21/08/2004	2561	21/08/2004	Tomw(T1)	21/08/2004	OPR	143	IND				63673
6628-23088	5.5	5.5	3.1	22/02/2007					Qhck	22/02/2007		2.5	INV				127540
6628-23089	5.5	5.5	3.1	22/02/2007					Qhck	22/02/2007		2.5	INV				127541
6628-23090	5.5	5.5	3.3	22/02/2007					Qhck	22/02/2007		5.5					127542
6628-24693	4	4	2.2	21/11/2006			17235	23/11/2006	Qpah	21/11/2006		1	INV				119305
6628-24694	5	5	1.8	21/11/2006			45010	23/11/2006	Qpah	21/11/2006		2	INV				119306
6628-24695	5	5	1.5	21/11/2006			18119	23/11/2006	Qpah	21/11/2006		2	INV				119307
6628-24913	7	6	3	24/08/2009	0.25	24/08/2009	4863	27/08/2009	Qpah	24/08/2009		6	INV				181753
6628-25191	5	5	2.5	22/02/2010			1984	23/02/2010	Qpah	22/02/2010		2					187636
6628-25268	6	6							Qpah	27/01/2009		1.8	INV				159057
6628-25269	6	6	2.75	27/01/2009					Qpah	27/01/2009		1.8	INV				159059
6628-25270	5	5	2.7	27/01/2009					Qpah	27/01/2009		1.75	INV				159060
6628-25271	6	6							Qpah	27/01/2009		2.25	INV				159061
6628-25272	6	6	3	28/01/2009					Qpah	28/01/2009		1.8	INV				159063
6628-25360	8	8	3.6	18/05/2010					Qpah	18/05/2010		8	INV				189104
6628-25361	8	8							Qpah	18/05/2010							189103
6628-25364	5.6	5.6							Qpah	01/06/2010		2.6	INV				187117
6628-25365	5.5	5.5	2.9	01/06/2010					Qpah	01/06/2010		2.5	INV				187118
6628-25366	5.6	5.6	3.2	01/06/2010					Qpah	01/06/2010		2.6	INV				187116
6628-25692	4.6	4.6	2.3	23/03/2011					Qpah	23/03/2011		1.5	INV				199404
6628-25693	8.8	8.8							Qpah	19/03/2011		3.5	INV				199400
6628-25760	50	44	13	28/09/2009	0.5	25/09/2009			Qpah	28/09/2009		44	DRN				183006
6628-25761	22	20	5	14/10/2009	2	09/10/2009			Qpah	14/10/2009		20	DRN				183381
6628-26120	4.5	4.5							Qpah	31/01/2011		1.5	INV				198627
6628-26121	4.5	4.5	2.6	01/02/2011					Qpah	01/02/2011		4.5	INV				198658

Unit No	Max Depth (m)	Latest Depth (m)	SWL (m)	SWL Date	Yield (L/sec)	Yield Date	TDS (mg/L)	TDS Date	Aquifer	Date	Status	Cased To (m)	Purpose	Obs No	SWL Status	Salinity Status	Permit No
6628-26122	4.5	4.5	2.46	31/01/2011					Qpah	31/01/2011		1.5	INV				198659
6628-26123	4.5	4.5	2.46	31/01/2011					Qpah	31/01/2011		1.5	INV				198660
6628-26124	4.5	4.5	2.48	31/01/2011					Qpah	31/01/2011		1.5	INV				198662
6628-26125	4.5	4.5	2.51	31/01/2011					Qpah	31/01/2011		1.5	INV				198664
6628-26286	5	5	2	13/04/2012					Qpah	13/04/2012		2	INV				211005
6628-26287	5	5	2	13/04/2012					Qpah	13/04/2012		2	INV				211006
6628-26288	5	5	2	13/04/2012					Qpah	13/04/2012		2	INV				211007
6628-26350	4.5	4.5	2.6	14/02/2012					Qpah	14/02/2012		1.5	INV				209973
6628-26351	4.5	4.5	2.6	14/02/2012					Qpah	14/02/2012		1.5	INV				209974
6628-26352	4.5	4.5							Qpah	14/02/2012			INV				209975
6628-26372	4.5	0	3.42	15/03/2012					Qpah	15/03/2012	BKF		INV				432167
6628-26373	5	5	3.58	15/03/2012					Qpah	15/03/2012		2	INV				210596
6628-26374	5	5	2.7	15/03/2012					Qpah	15/03/2012		2	INV				
6628-26375	5	5	2.8	16/03/2012					Qpah	16/03/2012		2	INV				210598
6628-26376	5	5	2.6	16/03/2012					Qpah	16/03/2012		2	INV				210599
6628-26377	5	5	3.2	22/03/2012					Qpah	22/03/2012		2	INV				210600
6628-26389	5	5	3	30/05/2012					Qpah	30/05/2012		2	INV				211965
6628-26390	5	5	3	29/05/2012					Qpah	29/05/2012		2	INV				211961
6628-26391	5	5	3	29/05/2012					Qpah	29/05/2012		2	INV				211966
6628-26392	5	5	3	30/05/2012					Qpah	30/05/2012		2	INV				211962
6628-26393	5	5	3	29/05/2012					Qpah	29/05/2012		2	INV				211963
6628-26394	5	5	3	30/05/2012					Qpah	30/05/2012		2	INV				211964
6628-26581	16	0							Qpah	01/08/2012	BKF		INV				214601
6628-26592	5	5	3	21/06/2012					Qpah	21/06/2012		5	INV				212232
6628-26593	5	5	3	21/06/2012					Qpah	21/06/2012		2	INV				212230
6628-26594	5	5	3	21/06/2012					Qpah	21/06/2012		2	INV				212231
6628-26738	17	17							Qpah	21/05/2013			INV				221400
6628-26739	7	0							Qpah	21/05/2013	BKF		INV				230819
6628-26812	6.1	6.1							Qpah	03/05/2013		3.1	INV				220545
6628-26963	4.5	0	2.5	07/05/2013					Qhck	07/05/2013	BKF		INV				220839
6628-26964	5	0	2.6	17/05/2013					Qhck	17/05/2013	BKF		INV				220840
6628-26966	5	5	3.02	29/07/2013					Qpah	29/07/2013		2					221768
6628-26967	5	5	2.91	29/07/2013					Qpah	29/07/2013		2	INV				221769
6628-26968	5	5							Qpah	29/07/2013		2	INV				221770
6628-26969	5	5	2.84	31/07/2013					Qpah	31/07/2013		2	INV				221771
6628-26970	5	5	2.67	31/07/2013					Qpah	31/07/2013		2	INV				221772
6628-26971	5	5	2.69	31/07/2013					Qpah	31/07/2013		2	INV				221773
6628-26979	4	4	2.5	26/06/2013					Qpah	26/06/2013		1	INV				220807
6628-26980	4	4	2.1	26/06/2013					Qpah	26/06/2013		1	INV				220808
6628-26981	4	4	2.3	25/06/2013					Qpah	25/06/2013		1	INV				220809
6628-26982	4	4	2.3	25/06/2013					Qpah	25/06/2013		1	INV				220810
6628-26991	6.2	6.2							Qpah	04/12/2013		2.2	INV				

Unit No	Max Depth (m)	Latest Depth (m)	SWL (m)	SWL Date	Yield (L/sec)	Yield Date	TDS (mg/L)	TDS Date	Aquifer	Date	Status	Cased To (m)	Purpose	Obs No	SWL Status	Salinity Status	Permit No
6628-27059	5	5	3.2	17/09/2013					Qpah	17/09/2013		2	INV				225964
6628-27060	5	5	3.1	17/09/2013					Qpah	17/09/2013		2	INV				225965
6628-27083	5.5	5.5	3	14/10/2013			6217	14/10/2013	Qpah	14/10/2013		2.5	INV				226670
6628-27087	5.5	5.5	3	14/10/2013			7491	14/10/2013	Qpah	14/10/2013		2.5	INV				226676
6628-27100	2.1	2.1							Qpah	29/08/2013		1.1	INV				225518
6628-27101	2.1	2.1							Qpah	29/08/2013		1.1	INV				225517
6628-27102	2.7	2.7							Qpah	29/08/2013		1.4	INV				225516
6628-27103	5.1	5							Qpah	29/08/2013		1					225515
6628-27104	5.1	5.1							Qpah	29/08/2013		1.1	INV				225514
6628-27559	6.8	0							Qpah		BKF						236811
6628-27838	5	5	2.62	18/11/2014					Qpah	18/11/2014		2					238786
6628-27839	5	5							Qpah	18/11/2014		2	INV				238787
6628-27840	5	5	2.55	19/11/2014					Qpah	19/11/2014		2	INV				238788
6628-27841	5	5	2.52	19/11/2014					Qpah	19/11/2014		2	INV				238789
6628-27842	5	5							Qpah	19/11/2014		2	INV				238790
6628-27843	5	5	2.69	11/02/2015					Qpah	11/02/2015		3	INV				238791
6628-27844	5	5	2.94	11/02/2015					Qpah	11/02/2015		5	INV				238792
6628-27845	5	5	3.17	11/02/2015					Qpah	11/02/2015		5	INV				238783
6628-27846	5	5	3.48	13/02/2015					Qpah	13/02/2015		2	INV				238784
6628-27847	5	5	3.42	13/02/2015					Qpah	13/02/2015		2	INV				238785
6628-27914	4.5	4.5	2.6	22/05/2015					Qpah	22/05/2015		4.5	INV				246901
6628-27915	5	5	2.8	16/01/2014					Qhck	16/01/2014		2	INV				224843
6628-27916	5	5	2.9	16/01/2014					Qhck	16/01/2014		2	INV				224844
6628-27917	5	5	2.8	16/01/2014					Qhck	16/01/2014		2	INV				224845
6628-28036	5	5	3.39	07/09/2015					Qpah	07/09/2015		3.2					252327
6628-28039	7.2	0	4.59	16/10/2011					Qpah	16/10/2011	BKF		INV				256656
6628-28040	6.5	0	4.42	16/10/2015					Qpah	16/10/2015	BKF		INV				256655
6628-28041	6.5	0	4.5	16/10/2015					Qpah	16/10/2015	BKF		INV				256654
6628-28271	5.2	5.2	2.97	15/02/2016					Qpah	15/02/2016		2	INV				255128
6628-28272	5.5	5.5	3.45	15/02/2016					Qpah	15/02/2016		2.5	INV				255129
6628-28273	5.5	5.5	4.08	15/02/2016					Qpah	15/02/2016		2.5	INV				255130
6628-28277	5	5	2.87	02/01/2015					Qpah	02/01/2015		2	INV				252910
6628-28278	5	5	2.82	02/01/2015					Qpah	02/01/2015		2	INV				252912
6628-28279	5	5	2.98	02/11/2015					Qpah	02/11/2015		2	INV				252913
6628-28280	5	5	2.93	03/11/2015					Qpah	03/11/2015		2					252914
6628-28281	5	5	2.7	03/11/2015					Qpah	03/11/2015		1.7	INV				252917
6628-28282	5	5	2.75	03/11/2015					Qpah	03/11/2015		2					252918
6628-28283	5	5	2.62	04/11/2015					Qpah	04/11/2015		2	INV				252919
6628-28284	5	5	3.5	17/12/2015					Qpah	17/12/2015		2					252920
6628-28285	5	5	3.53	18/12/2015					Qpah	18/12/2015		2	INV				252915
6628-28286	5	5	3.29	16/12/2015					Qpah	16/12/2015		2	INV				252916
6628-28813	7.1	7.1	3.9	28/03/2017					Qpah	28/03/2017		3.5	INV				281654

Unit No	Max Depth (m)	Latest Depth (m)	SWL (m)	SWL Date	Yield (L/sec)	Yield Date	TDS (mg/L)	TDS Date	Aquifer	Date	Status	Cased To (m)	Purpose	Obs No	SWL Status	Salinity Status	Permit No
6628-28814	7.1	7.1	3.8	28/03/2017					Qpah	28/03/2017		3.5	INV				281653
6628-28997	5.5	5.5							Qpah	25/07/2017		2.5	ENV				285815
6628-29020	19	0							Qpah		BKF						291049
6628-29021	35	0							Qpah	25/08/2017	BKF		INV				291050
6628-29022	20.5	0							Qpah	22/08/2017	BKF		INV				291051
6628-29023	35	0							Qpah	21/08/2017	BKF		INV				291052
6628-29189	5	0							Qpah	27/07/2017	BKF		ENV				381353
6628-29190	5	0							Qpah	27/07/2017	BKF		ENV				381354
6628-29191	5	0							Qpah	27/07/2017	BKF		ENV				351390
6628-29516	6	6							Qpah	20/04/2018		3	MON				303374
6628-29607	6	6							Qpah	09/07/2018		3	ENV				305086
6628-29608	5.5	5.5							Qpah	09/07/2018		2.5	ENV				305087
6628-29609	5.5	5.5							Qpah	10/07/2018		2.5	ENV				305088
6628-29665	8.6	8.6		01/08/2018					Qpah	01/08/2018		5.6	MON				326020
6628-29666	5	5							Qpah	14/06/2018			INV				305389
6628-29667	5	5							Qpah	14/06/2018			INV				305388
6628-29669	8.5	8.5							Qpah	02/08/2018		5.5	INV				326019
6628-29670	8.5	8.5							Qpah	02/08/2018		8.5	INV				326021
6628-29783	4.5	4.5							Qpah			1.5					
6628-29991	6	6							Qpah	15/10/2018			INV				331433
6628-29999	5.5	5.5							Qpah	19/10/2018			INV				331524
6628-30007	5	5							Qpah	24/10/2018			INV				331602
6628-30008	5	5							Qpah	10/10/2018			INV				331605
6628-30010	5.5	5.5							Qpah	12/10/2018			INV				331604
6628-30011	5.5	5.5							Qpah	22/10/2018			INV				331608
6628-30013	5.5	5.5							Qhck	25/10/2018			INV				331607
6628-30014	5.5	5.5							Qhck	22/10/2018			INV				331609
6628-30093	4.2	4.2							Qhck	22/02/2019			INV				339802
6628-30268	5	5							Qpah	22/10/2018			INV				331603
6628-30306	5	5								14/06/2018			INV				305387
6628-30319	17	17								08/08/2019		11	ENV				342046
6628-30450	5.5	0		09/10/2019						09/10/2019	BKF		INV				381352
6628-30548	4.2	4.2		16/10/2019						16/10/2019			INV				351366
6628-30549	4.5	4.5		14/11/2019						14/11/2019			INV				351367
6628-30550	4.5	4.5		14/11/2019						14/11/2019			INV				351368
6628-30708	5.5	5.5								01/05/2020			ENV				362407
6628-30709	5.5	5.5								01/05/2020			ENV				362406
6628-30710	5.5	5.5								30/04/2020			ENV				362405
6628-30740	6.5	6.5								25/05/2020		6.5	INV				363172
6628-30741	6.5	6.5								25/05/2020		6.5	INV				363173
6628-30756	6	6	2.6	22/06/2020						22/06/2020			MON				363887
6628-30805	5	5								12/05/2020			INV				355688

Unit No	Max Depth (m)	Latest Depth (m)	SWL (m)	SWL Date	Yield (L/sec)	Yield Date	TDS (mg/L)	TDS Date	Aquifer	Date	Status	Cased To (m)	Purpose	Obs No	SWL Status	Salinity Status	Permit No
6628-30806	5	5								12/05/2020			INV				355689
6628-31015	5	5								08/12/2020			ENV				385028
6628-31016	5	5								08/12/2020			ENV				385029
6628-31017	5	5								08/12/2020			ENV				385024
6628-31235	6	6		09/04/2021						09/04/2021	DRY	6	INV				393270
6628-31267	12	12		21/07/2020						21/07/2020	DRY	5.5	ENV				355691
6628-31268	5	5		11/05/2020						11/05/2020	DRY	2	ENV				355691
6628-31277	12	12								20/07/2020			ENV				362756
6628-31278	10.2	10.2								21/07/2020			ENV				357428
6628-31281	12	12								27/05/2020		5.5	ENV				355691
6628-31331	6	6	3.5	10/03/2021						10/03/2021		3	INV				391117
6628-31332	6	6	3.5	10/03/2021						10/03/2021		3	INV				391118
6628-31333	6	6	3.5	10/03/2021						10/03/2021			INV				392343
6628-31334	6	6	3.5	23/04/2021						23/04/2021			INV				392342
6628-31335																	
6628-31614	12	12								23/11/2021			ENV				409180
6628-31615	12	12								22/11/2021			ENV				409182
6628-31616	12	12								25/11/2021			ENV				409184
6628-31681	5	5								16/02/2022		2	INV				414156
6628-31682	5	5								16/02/2022		2	INV				414157
6628-31683	5.5	5.5								16/02/2022		2.5	INV				414158
6628-31684	5	5								06/12/2021		2	ENV				410206
6628-31685	5	5								06/12/2021		2	ENV				410205
6628-31686	5	0								06/12/2021	BKF		ENV				432166
6628-31687	5	5		07/12/2021						07/12/2021	DRY	2	ENV				410208
6628-31688	5	5								07/12/2021		2	ENV				410209
6628-31689	5	5								07/12/2021		2	ENV				410210
6628-31690	5	5								08/12/2021		2	ENV				410212
6628-31691	5	5								07/12/2021		2	ENV				410211
6628-31705	5	5								17/02/2022			INV				413815
6628-31951	4.5	4.5	1.8	23/07/2022			1105	23/07/2022		23/07/2022			INV				417777
6628-31952	4.5	4.5								23/07/2022			INV				417776
6628-31953	4.5	4.5								23/07/2022			INV				417775
6628-31955	4.5	4.5								09/08/2022			INV				425340
6628-31956	4.5	4.5								10/08/2022			INV				425341
6628-31997	7	7								07/09/2022			INV				427751
6628-32001	6	6								08/09/2022			INV				427750
6628-32178	11	11								05/12/2022			INV				428064
6628-32179	11	11								05/10/2022		1	INV				428065
6628-32294	20	0								15/06/2021	BKF		INV				396707
6628-32338	4	4								17/03/2023			MON				439289
6628-32339	4	4								17/03/2023			INV				439290

Unit No	Max Depth (m)	Latest Depth (m)	SWL (m)	SWL Date	Yield (L/sec)	Yield Date	TDS (mg/L)	TDS Date	Aquifer	Date	Status	Cased To (m)	Purpose	Obs No	SWL Status	Salinity Status	Permit No
6628-32363	5.5	5.5								06/03/2023		2.4	ENV				438621
6628-32364	6	6								06/03/2023		2.8	ENV				438622
6628-32683	4	4								10/10/2023			ENV				448830
6628-32685	4	4		09/10/2023						09/10/2023	DRY		ENV				448828
6628-32686	4	4								10/10/2023			ENV				448829
6628-32687	4	4		09/10/2023						09/10/2023	DRY		ENV				448826
6628-32732	5	5		30/10/2023						30/10/2023	DRY		INV				449563
6628-32733	5	5		30/10/2023						30/10/2023	DRY		INV				449564
6628-32734	5	5		24/10/2023						24/10/2023	DRY		INV				449003
6628-32735	5	5		24/10/2023						24/10/2023	DRY		INV				449004
6628-32736	5	5		24/10/2023						24/10/2023	DRY		INV				449005
6628-32737	5	5		24/10/2023						24/10/2023	DRY		INV				449006
6628-32738	5	5		25/10/2023						25/10/2023	DRY		INV				449007
6628-32778	5	5								16/11/2023			ENV				448446
6628-32818	5	5								21/09/2023		2	ENV				448443
6628-32821	5	5								21/09/2023		2	ENV				448444
6628-32822	5	5								22/09/2023		2	ENV				448445
6628-32870	4.5	4.5								11/12/2023			INV				455817
6628-32891	7	7								10/01/2024			MON				456719
6628-32892	7	7								10/01/2024		7	MON				456720
6628-32893	7	7								10/01/2024		7	MON				456721

393 records

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Appendix D

Borehole Logs

BOREHOLE LOG

ENVIRONMENTAL-SOIL BORE

SOIL BORE BH01

Client MFS
Project MFS Angle Park DSI
Project No. 12616808
Site Angle Park MFS
Location 456 Grand Junction Road
Date Drilled 23/10/2023

Drill Co. WB Drilling Pty. Ltd.
Driller WB Drilling Pty. Ltd.
Rig Type Eziprobe
Total Depth (m) 4.50
Diameter (mm) 50

Latitude -34.8505716724321
Longitude 138.556521814317
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By TW
Checked By AR

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Water	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
0	HA					GRASS	SM	L		0
0.2			BH01_0.2-0.3 (FD02,FS02)			Silty SAND fine to medium, poorly graded, dark brown with tan, trace rootlets (Reworked NATURAL)	SM	L		-0.2
0.4						Silty SAND fine to medium, poorly graded, pale brown (Reworked NATURAL)	SM	L		-0.4
0.6			BH01_0.6-0.7			SAND fine to medium, poorly graded, orange- brown (FILL)				-0.6
0.8	PT					Silty SAND fine to medium, poorly graded, pale brown (possible NATURAL - SOIL)	SM	L		-0.8
1						Sandy CLAY low to medium plasticity, red- brown, fine to medium, poorly graded sand (NATURAL - SOIL)	SM	F		-1
1.2										-1.2
1.4			BH01_1.3-1.4			Sandy CLAY low to medium plasticity, orange- brown, fine to medium, poorly graded sand (NATURAL - SOIL)	SM	F		-1.4
1.6										-1.6
1.8										-1.8
2										-2
2.2										-2.2
2.4										-2.4
2.6						Sandy CLAY medium plasticity, red- brown, fine to medium, poorly graded sand (NATURAL - SOIL)	M	F		-2.6
2.8										-2.8
3										-3
3.2										-3.2
3.4										-3.4
3.6										-3.6
3.8										-3.8
4										-4
4.2				▽						-4.2
4.4										-4.4
4.6						Termination Depth at: 4.50 m. Target depth achieved.				-4.6

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, MR-Mud Rotary, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-SOIL BORE

SOIL BORE BH02

Client MFS
Project MFS Angle Park DSI
Project No. 12616808
Site Angle Park MFS
Location 456 Grand Junction Road
Date Drilled 23/10/2023

Drill Co. WB Drilling Pty. Ltd.
Driller WB Drilling Pty. Ltd.
Rig Type Eziprobe
Total Depth (m) 4.00
Diameter (mm) 50

Latitude -34.8503281362355
Longitude 138.556878045201
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By TW
Checked By AR

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Water	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
	DC					OTHER			PAVER	
	HA		BH02_0.08-0.2			SAND fine to coarse, poorly graded, yellow- tan, trace fine gravel (FILL)	SM	L		
0.2						Clayey SAND low to medium plasticity, fine to medium, poorly graded, red- brown (possible NATURAL - SOIL)	SM	MD		-0.2
0.4										-0.4
	PT									
0.6										-0.6
0.8										-0.8
1			BH02_0.9-1.0							-1
1.2										-1.2
1.4										-1.4
1.6										-1.6
1.8						Sandy CLAY low to medium plasticity, brown mottled orange- brown, fine to medium, poorly graded sand (NATURAL - SOIL)	SM	F		-1.8
2										-2
2.2										-2.2
2.4										-2.4
2.6										-2.6
2.8						Sandy CLAY medium plasticity, brown- red, fine to medium, poorly graded sand (NATURAL - SOIL)	SM	F		-2.8
3										-3
3.2						Sandy CLAY medium plasticity, orange- brown mottled red- brown, fine to medium, poorly graded sand (NATURAL - SOIL)	SM	F		-3.2
3.4				▽						-3.4
3.6										-3.6
3.8										-3.8
4						Termination Depth at: 4.00 m. Target depth achieved.				-4

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, MR-Mud Rotary, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-SOIL BORE

SOIL BORE BH03

Client MFS
Project MFS Angle Park DSI
Project No. 12616808
Site Angle Park MFS
Location 456 Grand Junction Road
Date Drilled 23/10/2023

Drill Co. WB Drilling Pty. Ltd.
Driller WB Drilling Pty. Ltd.
Rig Type Eziprobe
Total Depth (m) 4.00
Diameter (mm) 50

Latitude -34.8510287795216
Longitude 138.556537237018
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By TW
Checked By AR

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Water	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
	PT		BH03_0.01-0.3 (FD03,FS03)			GRASS	SM	L		
0.2						Clayey SAND fine, poorly graded, dark brown-, with fine to medium gravel, angular to subangular, fine to medium, poorly graded gravel (FILL)				-0.2
0.4			BH03_0.4-0.5							-0.4
0.6						Gravelly SAND fine to medium, poorly graded, dark black-, with fine to medium gravel, angular to subangular, fine to medium, poorly graded gravel (FILL)	D	L		-0.6
0.8										-0.8
1										-1
1.2			BH03_1.2-1.3							-1.2
1.4										-1.4
1.6						SAND medium, well graded, pale yellow-, medium to coarse sand (FILL)	D	VL		-1.6
1.8										-1.8
2						Sandy GRAVEL medium, poorly graded, subangular to subrounded, some fine to medium sand (FILL)	D	VL		-2
2.2						Sandy CLAY low plasticity, brown- to dark brown-	SM	F		-2.2
2.4										-2.4
2.6										-2.6
2.8						Sandy CLAY medium plasticity, dark red- brown with pale grey-, coarse sand	M	ST		-2.8
3										-3
3.2										-3.2
3.4										-3.4
3.6				▽						-3.6
3.8										-3.8
4						Termination Depth at: 4.00 m. Target depth achieved.				-4

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, MR-Mud Rotary, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-SOIL BORE

SOIL BORE BH04

Client MFS
Project MFS Angle Park DSI
Project No. 12616808
Site Angle Park MFS
Location 456 Grand Junction Road
Date Drilled 23/10/2023

Drill Co. WB Drilling Pty. Ltd.
Driller WB Drilling Pty. Ltd.
Rig Type Eziprobe
Total Depth (m) 3.50
Diameter (mm) 50

Latitude -34.8507452197373
Longitude 138.556913835928
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By TW
Checked By AR

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Water	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
	DC		BH04_PAVER (FD01,FS01)			OTHER			PAVER	
	HA		BH04_0.08-0.3			Gravelly SAND fine to coarse, poorly graded, grey-brown, subangular, fine to medium, poorly graded gravel (FILL)	SM	L		
0.2										-0.2
0.4						Clayey SAND low plasticity, fine and coarse, poorly graded, dark brown mottled red- brown (possible NATURAL - SOIL)	SM	MD		-0.4
0.6	PT		BH04_0.6-0.7							-0.6
0.8						Sandy CLAY low to medium plasticity, orange- brown, fine to medium, poorly graded sand (NATURAL - SOIL)	SM	F		-0.8
1										-1
1.2			BH04_1.2-1.4							-1.2
1.4										-1.4
1.6						Sandy CLAY low to medium plasticity, red- brown, fine to medium, poorly graded sand (NATURAL - SOIL)	SM	F		-1.6
1.8										-1.8
2										-2
2.2										-2.2
2.4						Sandy CLAY medium plasticity, red- brown mottled tan- brown, fine to medium, poorly graded sand (NATURAL - SOIL)	SM	F		-2.4
2.6										-2.6
2.8										-2.8
3				▽						-3
3.2						SAND fine to coarse, poorly graded, orange- brown (NATURAL - SOIL)	VM	L		-3.2
3.4										-3.4
3.6						Termination Depth at: 3.50 m. Target depth achieved.				-3.6

Notes

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Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, MR-Mud Rotary, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-SOIL BORE

SOIL BORE BH05

Client MFS
Project MFS Angle Park DSI
Project No. 12616808
Site Angle Park MFS
Location 456 Grand Junction Road
Date Drilled 23/10/2023

Drill Co. WB Drilling Pty. Ltd.
Driller WB Drilling Pty. Ltd.
Rig Type Eziprobe
Total Depth (m) 4.50
Diameter (mm) 50

Latitude -34.8503046249971
Longitude 138.557431669906
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By TW
Checked By AR

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Water	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
0	PT		BH05_0.0-0.02			ASPHALT	SM	L		0
0.2						Gravelly SAND fine to medium, poorly graded, tan-brown, subangular, fine to medium, poorly graded gravel (FILL)	SM	L	Glass fragments	-0.2
0.4			BH05_0.3-0.4			Gravelly SAND fine to medium, poorly graded, dark grey- black, subangular, fine to medium, poorly graded gravel (FILL)	SM	F		-0.4
0.6						Sandy CLAY low to medium plasticity, red- brown, fine to medium, poorly graded sand (NATURAL - SOIL)				-0.6
0.8										-0.8
1						Sandy CLAY low to medium plasticity, orange- brown, fine to medium, poorly graded sand (NATURAL - SOIL)	SM	S		-1
1.2										-1.2
1.4										-1.4
1.6						Sandy CLAY medium plasticity, red- brown, fine to medium, poorly graded sand (NATURAL - SOIL)	SM	ST		-1.6
1.8										-1.8
2										-2
2.2										-2.2
2.4										-2.4
2.6				▽						-2.6
2.8										-2.8
3										-3
3.2						Clayey SAND fine to medium, poorly graded, red-brown (NATURAL - SOIL)	M	L		-3.2
3.4										-3.4
3.6										-3.6
3.8										-3.8
4										-4
4.2										-4.2
4.4										-4.4
4.6						Termination Depth at: 4.50 m. Target depth achieved.				-4.6

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, MR-Mud Rotary, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-SOIL BORE

SOIL BORE BH06

Client MFS
Project MFS Angle Park DSI
Project No. 12616808
Site Angle Park MFS
Location 456 Grand Junction Road
Date Drilled 23/10/2023

Drill Co. WB Drilling Pty. Ltd.
Driller WB Drilling Pty. Ltd.
Rig Type Eziprobe
Total Depth (m) 4.00
Diameter (mm) 50

Latitude -34.8506753146648
Longitude 138.557045180351
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By TW
Checked By AR

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Water	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
0	HA		BH06_0.0-0.1			Gravelly SAND fine to medium, poorly graded, dark brown, angular, fine to medium, poorly graded gravel (FILL)	SM	L		0
0.2						Clayey SAND fine to medium, poorly graded, dark brown, trace fine gravel (FILL)	SM	L		-0.2
0.4			BH06_0.4-0.5							-0.4
0.6	PT									-0.6
0.8										-0.8
1										-1
1.2										-1.2
1.4										-1.4
1.6						Sandy CLAY low to medium plasticity, red- brown, fine to medium, poorly graded sand (NATURAL - SOIL)	SM	F		-1.6
1.8										-1.8
2										-2
2.2						Sandy CLAY low to medium plasticity, orange- brown, fine to medium, poorly graded sand (NATURAL - SOIL)	SM	F		-2.2
2.4										-2.4
2.6										-2.6
2.8				▽						-2.8
3										-3
3.2						Sandy CLAY medium plasticity, red- brown mottled tan- brown, fine to medium, poorly graded sand (NATURAL - SOIL)	SM	F		-3.2
3.4										-3.4
3.6										-3.6
3.8										-3.8
4						Termination Depth at: 4.00 m. Target depth achieved.				-4

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, MR-Mud Rotary, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-SOIL BORE

SOIL BORE BH07

Client MFS
Project MFS Angle Park DSI
Project No. 12616808
Site Angle Park MFS
Location 456 Grand Junction Road
Date Drilled 23/10/2023

Drill Co. WB Drilling Pty. Ltd.
Driller WB Drilling Pty. Ltd.
Rig Type Eziprobe
Total Depth (m) 4.00
Diameter (mm) 50

Latitude -34.850901584141
Longitude 138.557407613844
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By TW
Checked By AR

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Water	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
	DC		BH07_PAVER			OTHER			PAVER	
0.2	HA		BH07_0.08-0.18			Gravelly SAND fine to medium, poorly graded, tan, subangular, fine to medium, poorly graded gravel (FILL)	SM	L		-0.2
0.4										-0.4
0.6	PT					Sandy CLAY low to medium plasticity, red- brown, fine to medium, poorly graded sand (NATURAL - SOIL)	SM	F		-0.6
0.8										-0.8
1			BH07_0.9-1.0							-1
1.2						Sandy CLAY low to medium plasticity, orange- brown, fine to medium, poorly graded sand (NATURAL - SOIL)	SM	F		-1.2
1.4										-1.4
1.6						Sandy CLAY medium plasticity, red- brown, fine to medium, poorly graded sand (NATURAL - SOIL)	M	F		-1.6
1.8										-1.8
2										-2
2.2										-2.2
2.4			BH07_2.4-2.5							-2.4
2.6										-2.6
2.8				▽						-2.8
3										-3
3.2										-3.2
3.4										-3.4
3.6										-3.6
3.8										-3.8
4						Termination Depth at: 4.00 m. Target depth achieved.				-4

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, MR-Mud Rotary, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-SOIL BORE

SOIL BORE BH08

Client MFS
Project MFS Angle Park DSI
Project No. 12616808
Site Angle Park MFS
Location 456 Grand Junction Road
Date Drilled 23/10/2023

Drill Co. WB Drilling Pty. Ltd.
Driller WB Drilling Pty. Ltd.
Rig Type Eziprobe
Total Depth (m) 4.50
Diameter (mm) 50

Latitude -34.8507614806294
Longitude 138.557714307681
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By TW
Checked By AR

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Water	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
	DC					OTHER			PAVER	
	HA		BH08_0.08-0.15			Gravelly SAND fine to medium, poorly graded, pale brown- tan, with fine to medium gravel, subangular to subrounded, fine to medium, poorly graded gravel (FILL)	SM	L		
0.2			BH08_0.2-0.3							-0.2
0.4							SM	L		-0.4
	PT					Gravelly SAND fine to medium, poorly graded, dark black-, with fine to medium gravel, fine to medium, poorly graded gravel (FILL)	SM	F		
0.6						Sandy CLAY low to medium plasticity, red- brown, fine to medium, poorly graded sand (NATURAL - SOIL)				-0.6
0.8										-0.8
1						Sandy CLAY low to medium plasticity, orange- brown, fine to medium, poorly graded sand (NATURAL - SOIL)	SM	F		-1
1.2										-1.2
1.4										-1.4
1.6						Sandy CLAY low to medium plasticity, red- brown, fine to medium, poorly graded sand (NATURAL - SOIL)	SM	F		-1.6
1.8										-1.8
2			BH08_1.9-2.0							-2
2.2										-2.2
2.4						Sandy CLAY low to medium plasticity, tan- brown, fine to medium, poorly graded sand (NATURAL - SOIL)	M	F		-2.4
2.6										-2.6
2.8				▽						-2.8
3										-3
3.2										-3.2
3.4										-3.4
3.6						Clayey SAND low plasticity, medium to coarse, poorly graded, tan- brown (NATURAL - SOIL)	M	L		-3.6
3.8										-3.8
4										-4
4.2										-4.2
4.4										-4.4
4.6						Termination Depth at: 4.50 m. Target depth achieved.				-4.6

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, MR-Mud Rotary, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-SOIL BORE

SOIL BORE BH09

Client SA MFS
Project MFS Angle Park DSI
Project No. 12616808
Site Angle Park MFS
Location 456 Grand Junction Road
Date Drilled 17/01/2024

Driller JA
Rig Type HA
Total Depth (m) 2.00
Diameter (mm) 150

Elevation 4 m AHD
Logged By JA
Checked By AR

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Water	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
0			BH09_0.0-0.1			Gravelly SAND fine to medium, poorly graded, yellow brown, fine to medium gravel, angular to subangular (FILL)	D	L	No odour, no staining	0
0.2						Gravelly SAND fine to medium, poorly graded, black, fine to medium gravel, angular to subangular (FILL)	D	L	Fly ash, no odour, no staining	-0.2
0.4			BH09_0.4-0.5							-0.4
0.9						Clayey SAND fine to medium, poorly graded, light brown, some fine gravel (FILL)	D	L	No odour, no staining	-0.9
1						Clayey SAND fine to medium, low plasticity, red brown (NATURAL)	SM	VS	No odour, no staining	-1
2						Termination Depth at 2.00 m. Target depth achieved				-2

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, MR-Mud Rotary, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-SOIL BORE

SOIL BORE BH10

Client SA MFS
Project MFS Angle Park DSI
Project No. 12616808
Site Angle Park MFS
Location 456 Grand Junction Road
Date Drilled 17/01/2024

Driller JA
Rig Type HA
Total Depth (m) 1.00
Diameter (mm) 150

Elevation 4 m AHD
Logged By JA
Checked By AR

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Water	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
0			BH10_0.0-0.1			Gravelly SAND fine to medium, poorly graded, yellow brown, fine to medium gravel, angular to subangular (FILL)	D	L	No odour, no staining	0
0.1										-0.1
0.2			BH10_0.2-0.3			Gravelly SAND fine to medium, poorly graded, black, fine to medium gravel, angular to subangular (FILL)	D	L	Fly ash, no odour, no staining	-0.2
0.3										-0.3
0.4										-0.4
0.5										-0.5
0.6										-0.6
0.7						Clayey SAND fine to medium, poorly graded, light brown, some fine gravel (FILL)	D	L	No odour, no staining	-0.7
0.8										-0.8
0.9						Clayey SAND fine to medium, low plasticity, red brown (NATURAL)	SM	VS	No odour, no staining	-0.9
1						Termination Depth at 1.00 m. Target depth achieved				-1
1.1										-1.1
1.2										-1.2
1.3										-1.3
1.4										-1.4
1.5										-1.5
1.6										-1.6
1.7										-1.7
1.8										-1.8
1.9										-1.9

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, MR-Mud Rotary, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-SOIL BORE

SOIL BORE BH11

Client SA MFS
Project MFS Angle Park DSI
Project No. 12616808
Site Angle Park MFS
Location 456 Grand Junction Road
Date Drilled 17/01/2024

Driller JA
Rig Type HA
Total Depth (m) 1.00
Diameter (mm) 150

Elevation 4 m AHD
Logged By JA
Checked By AR

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Water	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
0			BH11_0.0-0.1			Gravelly SAND fine to medium, poorly graded, yellow brown, fine to medium gravel, angular to subangular (FILL)	D	L	No odour, no staining	0
0.1										-0.1
0.2			BH11_0.2-0.3			Gravelly SAND fine to medium, poorly graded, black, fine to medium gravel, angular to subangular (FILL)	D	L	Fly ash, no odour, no staining	-0.2
0.3										-0.3
0.4										-0.4
0.5										-0.5
0.6										-0.6
0.7						Clayey SAND fine to medium, poorly graded, light brown, some fine gravel (FILL)	D	L	No odour, no staining	-0.7
0.8										-0.8
0.9						Clayey SAND fine to medium, low plasticity, red brown (NATURAL)	SM	VS	No odour, no staining	-0.9
1						Termination Depth at 1.00 m. Target depth achieved				-1
1.1										-1.1
1.2										-1.2
1.3										-1.3
1.4										-1.4
1.5										-1.5
1.6										-1.6
1.7										-1.7
1.8										-1.8
1.9										-1.9

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, MR-Mud Rotary, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-SOIL BORE

SOIL BORE BH12

Client SA MFS
Project MFS Angle Park DSI
Project No. 12616808
Site Angle Park MFS
Location 456 Grand Junction Road
Date Drilled 17/01/2024

Driller JA
Rig Type HA
Total Depth (m) 2.00
Diameter (mm) 150

Elevation 4 m AHD
Logged By JA
Checked By AR

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Water	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
0			BH12_0.0-0.1			Gravelly SAND fine to medium, poorly graded, yellow brown, fine to medium gravel, angular to subangular (FILL)	D	L	No odour, no staining	0
0.2						Gravelly SAND fine to medium, poorly graded, black, fine to medium gravel, angular to subangular (FILL)	D	L	Fly ash, no odour, no staining	-0.2
0.4						Clayey SAND fine to medium, poorly graded, light brown, some fine gravel (FILL)	D	L	No odour, no staining	-0.4
0.9			BH12_0.9-1.0			Sandy CLAY fine to medium, low plasticity, red brown (NATURAL)	SM	H	No odour, no staining	-0.9
1.4						Clayey SAND fine to medium, low plasticity, red brown (NATURAL)	SM	VS	No odour, no staining	-1.4
2						Termination Depth at 2.00 m. Target depth achieved				-2

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, MR-Mud Rotary, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-GROUNDWATER

MONITORING WELL MW01

Client SA MFS
Project MFS Angle Park DSI
Project No. 12616808
Site Angle Park MFS
Location 456 Grand Junction Road
Date Drilled 24/10/2023

Drill Co. WB Drilling Pty Ltd.
Driller WB Drilling Pty Ltd.
Rig Type Eziprobe
Total Depth (m) 5.00
Casing Diameter (mm) 50

Easting, Northing 276552.93, 6140745.8
Grid Ref GDA94_MGA_zone_54
Elevation 4 m AHD
TOC mAHD 0.8
Logged By TW
Checked By AR

B.C.L No. N/A **Casing** 50 mm PVC (Class 18) **Screen** 0.5mm Slotted PVC (Class 18) **Surface Completion** Monument

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Water	Well Details	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
0	HA		MW01_0.01-0.1		Monument Casing		GRASS	SM	L	No staining, no odour	0
0.5			MW01_0.4-0.5		Grout		Silty SAND fine to medium, poorly graded, brown, trace fine to medium gravel (Reworked NATURAL)	SM	L	No staining, no odour	-0.5
	PT						SAND fine to medium, poorly graded, dark black- black, trace fine to medium gravel	SM	F	No staining, no odour	
1							Sandy CLAY low to medium plasticity, red-brown, fine to medium, poorly graded sand (NATURAL - SOIL)	SM	F	No staining, no odour	-1
1.5					Bentonite		Sandy CLAY low to medium plasticity, orange- brown mottled tan- brown, fine to medium, poorly graded sand (NATURAL - SOIL)				-1.5
2			MW01_1.8-1.9								-2
2.5				▽							-2.5
3					Gravel Pack		Sandy CLAY medium plasticity, red- brown mottled tan- brown, fine to medium, poorly graded sand (NATURAL - SOIL)	M	F	No staining, no odour	-3
3.5											-3.5
4	SFA										-4
4.5											-4.5
5							Termination Depth at: 5.00 m. Target depth achieved.				-5
5.5											-5.5

Notes

This log is not intended for geotechnical purposes. Hollow triangle symbolises water strike, solid triangle symbolises recovered water level.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, MR-Mud Rotary, NDD-Non Destructive Drilling, PT-Pushtube, RB-Rotary Blade, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-GROUNDWATER

MONITORING WELL MW02

Client SA MFS
Project MFS Angle Park DSI
Project No. 12616808
Site Angle Park MFS
Location 456 Grand Junction Road
Date Drilled 24/10/2023

Drill Co. WB Drilling Pty Ltd.
Driller WB Drilling Pty Ltd.
Rig Type Eziprobe
Total Depth (m) 5.00
Casing Diameter (mm) 50

Easting, Northing 276665.67, 6140592.38
Grid Ref GDA94_MGA_zone_54
Elevation 4 m AHD
TOC mAHD 0.782
Logged By TW
Checked By AR

B.C.L No. N/A **Casing** 50 mm PVC (Class 18) **Screen** 0.5mm Slotted PVC (Class 18) **Surface Completion** Monument

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Water	Well Details	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
0	HA		MW02_0.3-0.4 (FD04,FS04)		Monument Casing		WASTE grey- white (FILL)	D	L	CONCRETE WASTE	0
0.5	PT		MW02_0.5-0.6		Grout		Gravelly SAND fine to medium, poorly graded, pale brown, fine to medium, poorly graded gravel (FILL)	SM	L	No staining, no odour	-0.5
1					Bentonite		Gravelly SAND fine to medium, poorly graded, pale brown with tan, subangular, fine to medium, poorly graded gravel (FILL)	SM	L	No staining, no odour	-1
1.5							Gravelly SAND fine to medium, poorly graded, dark grey to black, subangular, fine to medium, poorly graded gravel (FILL)	SM	F	No staining, no odour	-1.5
2							Sandy CLAY low to medium plasticity, red-brown, fine to medium, poorly graded sand (NATURAL - SOIL)	SM	F	No staining, no odour	-2
2.5							Sandy CLAY low to medium plasticity, orange- brown mottled tan- brown, fine to medium, poorly graded sand (NATURAL - SOIL)	M	F	No staining, no odour	-2.5
3					Gravel Pack		Sandy CLAY medium plasticity, red- brown mottled tan- brown, fine to medium, poorly graded sand (NATURAL - SOIL)				-3
3.5				▽							-3.5
4	SFA										-4
4.5											-4.5
5							Termination Depth at: 5.00 m. Target depth achieved.				-5
5.5											-5.5

Notes

This log is not intended for geotechnical purposes. Hollow triangle symbolises water strike, solid triangle symbolises recovered water level.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, MR-Mud Rotary, NDD-Non Destructive Drilling, PT-Pushtube, RB-Rotary Blade, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-GROUNDWATER

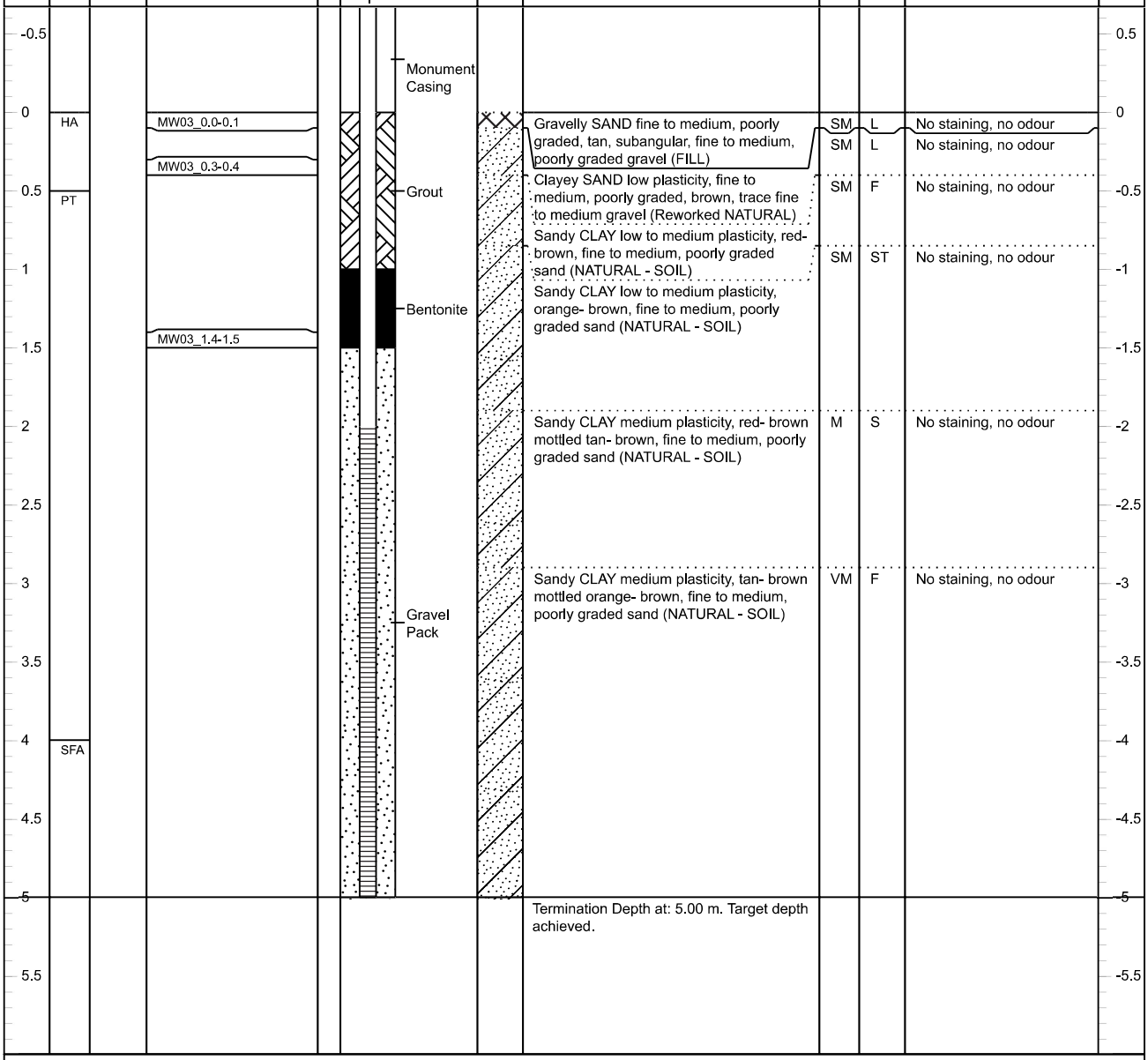
MONITORING WELL MW03

Client SA MFS
Project MFS Angle Park DSI
Project No. 12616808
Site Angle Park MFS
Location 456 Grand Junction Road
Date Drilled 24/10/2023

Drill Co. WB Drilling Pty Ltd.
Driller WB Drilling Pty Ltd.
Rig Type Eziprobe
Total Depth (m) 5.00
Casing Diameter (mm) 50

Easting, Northing 276791.44, 6140653.7
Grid Ref GDA94_MGA_zone_54
Elevation 4 m AHD
TOC mAHD 0.675
Logged By TW
Checked By AR

B.C.L No. N/A **Casing** 50 mm PVC (Class 18) **Screen** 0.5mm Slotted PVC (Class 18) **Surface Completion** Monument



Notes

This log is not intended for geotechnical purposes. Hollow triangle symbolises water strike, solid triangle symbolises recovered water level.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, MR-Mud Rotary, NDD-Non Destructive Drilling, PT-Pushtube, RB-Rotary Blade, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-GROUNDWATER

MONITORING WELL MW04

Client SA MFS
Project MFS Angle Park DSI
Project No. 12616808
Site Angle Park MFS
Location 456 Grand Junction Road
Date Drilled 24/10/2023

Drill Co. WB Drilling Pty Ltd.
Driller WB Drilling Pty Ltd.
Rig Type Eziprobe
Total Depth (m) 5.00
Casing Diameter (mm) 50

Easting, Northing 276897.68, 6140647.1
Grid Ref GDA94_MGA_zone_54
Elevation 4 m AHD
TOC mAHD -
Logged By TW
Checked By AR

B.C.L No. N/A **Casing** 50 mm PVC (Class 18) **Screen** 0.5mm Slotted PVC (Class 18) **Surface Completion** Gatic

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Water	Well Details	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
0	HA		MW04_0.2-0.3 (FD05,FS05)		Grout		WASTE white- tan (FILL)			CONCRETE RESIDUE	0
							Clayey SAND low plasticity, fine to medium, poorly graded, red- brown, trace fine to medium gravel (Reworked NATURAL)	SM	L	No staining, no odour	
0.5	PT						SAND fine to medium, poorly graded, dark grey to black (FILL)	SM	L	No staining, no odour	-0.5
			MW04_0.75-0.85								
1					Bentonite		Sandy CLAY low to medium plasticity, red-brown, fine to medium, poorly graded sand (NATURAL - SOIL)	SM	F	No staining, no odour	-1
1.5							Sandy CLAY low to medium plasticity, orange- brown, fine to medium, poorly graded sand (NATURAL - SOIL)	SM	F	No staining, no odour	-1.5
2							Sandy CLAY medium plasticity, red- brown mottled tan- brown, fine to medium, poorly graded sand (NATURAL - SOIL)	SM	F	No staining, no odour	-2
			MW04_2.1-2.2				Sandy CLAY medium plasticity, orange-brown mottled tan- brown, fine to medium, poorly graded sand (NATURAL - SOIL)	M	S	No staining, no odour	
2.5											-2.5
3					Gravel Pack						-3
3.5											-3.5
4	SFA										-4
4.5											-4.5
5							Termination Depth at: 5.00 m. Target depth achieved.				-5
5.5											-5.5

Notes

This log is not intended for geotechnical purposes. Hollow triangle symbolises water strike, solid triangle symbolises recovered water level.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, MR-Mud Rotary, NDD-Non Destructive Drilling, PT-Pushtube, RB-Rotary Blade, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-GROUNDWATER

MONITORING WELL MW05

Client SA MFS
Project MFS Angle Park DSI
Project No. 12616808
Site Angle Park MFS
Location 456 Grand Junction Road
Date Drilled 25/10/2023

Drill Co. WB Drilling Pty Ltd.
Driller WB Drilling Pty Ltd.
Rig Type Eziprobe
Total Depth (m) 5.00
Casing Diameter (mm) 50

Easting, Northing 276622.84, 6140799.65
Grid Ref GDA94_MGA_zone_54
Elevation 4 m AHD
TOC mAHD -
Logged By TW
Checked By AR

B.C.L No. N/A **Casing** 50 mm PVC (Class 18) **Screen** 0.5mm Slotted PVC (Class 18) **Surface Completion** Gatic

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Water	Well Details	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
0	DC		MW05_PAVER				OTHER	SM	L	PAVER	0
	HA		MW05_0.08-0.12				Gravelly SAND fine to coarse, poorly graded, orange- brown, subangular, fine to medium, poorly graded gravel (FILL)	SM	L	No staining, no odour	
								SM	L	No staining, no odour	
0.5	PT				Grout		Gravelly SAND fine to medium, poorly graded, dark grey, subangular, fine to medium, poorly graded gravel (FILL)			No staining, no odour	-0.5
							SAND fine to coarse, poorly graded, tan, trace fine to medium gravel (FILL)				
1							Sandy CLAY low to medium plasticity, dark brown mottled orange- brown, fine to medium, poorly graded sand (NATURAL - SOIL)	SM	F	No staining, no odour	-1
					Bentonite						
1.5			MW05_1.4-1.5								-1.5
2											-2
2.5				▽							-2.5
							Sandy CLAY medium plasticity, red- brown mottled tan- brown, fine to medium, poorly graded sand (NATURAL - SOIL)	M	S	No staining, no odour	
3											-3
					Gravel Pack						
3.5			MW05_3.4-3.5								-3.5
4	SFA										-4
4.5											-4.5
5							Termination Depth at: 5.00 m. Target depth achieved.				-5
5.5											-5.5

Notes

This log is not intended for geotechnical purposes. Hollow triangle symbolises water strike, solid triangle symbolises recovered water level.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, MR-Mud Rotary, NDD-Non Destructive Drilling, PT-Pushtube, RB-Rotary Blade, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

TEST PIT LOG

ENVIRONMENTAL-TEST PIT

Test Pit TP01

Client SA MFS
Project MFS Angle Park DSI
Project No. 12616808
Site Angle Park MFS
Location 456 Grand Junction Road
Date Drilled 24/10/2023

Contractor A&J Civils
Machine Backhoe
Total Depth (m) 2.0
Pit Width (m) 0.5
Pit Length (m) 1.5

Elevation 4 m AHD
Logged By TW
Checked By AR

Depth (m)	PID (ppm)	Sample ID	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
0		TP01_0-0.2		FILL: clayey sandy GRAVEL, brown, fine to coarse grained gravel, trace concrete and organic matter (wood and root fibers).	SM	L	No staining, no odour	0
0.4		TP01_0.4-0.5		sandy CLAY, red brown to dark brown, low plasticity, with trace white mottling	SM	F	No staining, no odours	-0.4
0.8		TP01_0.9-1.0		sandy CLAY, dark tan, low plasticity, trace fine to medium grained gravel	SM	F	No staining, no odours	-0.8
2				Termination Depth at: 2.00 m. Target depth achieved.				-2

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense, VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

TEST PIT LOG

ENVIRONMENTAL-TEST PIT

Test Pit TP02

Client SA MFS
Project MFS Angle Park DSI
Project No. 12616808
Site Angle Park MFS
Location 456 Grand Junction Road
Date Drilled 24/10/2023

Contractor A&J Civils
Machine Backhoe
Total Depth (m) 2.0
Pit Width (m) 0.5
Pit Length (m) 1.5

Elevation 4 m AHD
Logged By TW
Checked By AR

Depth (m)	PID (ppm)	Sample ID	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
0		TP02_0.0-0.2		FILL: sandy GRAVEL, pale grey to brown, fine to coarse gravel, trace organic matter (wood and root fibers)	D	L	No staining, no odour	0
0.2				FILL (REWORKED NATURAL): clayey SAND, brown with red brown, fine to medium, poorly graded, trace fine to medium gravel	D	L	No staining, no odour	-0.2
0.4		TP02_0.4-0.5						-0.4
0.6				sandy CLAY, brown to tan, low plasticity, trace fine to medium grained gravel	SM	F	No staining, no odour	-0.6
0.9		TP02_0.9-1.0						-0.9
2				Termination Depth at: 2.00 m. Target depth achieved.				-2

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense, VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

TEST PIT LOG

ENVIRONMENTAL-TEST PIT

Test Pit TP03

Client SA MFS
Project MFS Angle Park DSI
Project No. 12616808
Site Angle Park MFS
Location 456 Grand Junction Road
Date Drilled 24/10/2023

Contractor A&J Civils
Machine Backhoe
Total Depth (m) 2.0
Pit Width (m) 0.5
Pit Length (m) 1.5

Elevation 4 m AHD
Logged By TW
Checked By AR

Depth (m)	PID (ppm)	Sample ID	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
0.1		TP03_0.0-0.2		Gravelly SAND brown, fine to medium, poorly graded, subangular, fine to coarse, poorly graded gravel, trace organic matter (root fibers) (FILL)	D	L	No staining, no odour	-0.1
0.2								-0.2
0.3				Gravelly SAND, black to dark grey, fine to medium, poorly graded, fine to medium gravel, subangular (FILL)	D	L	No staining, no odour	-0.3
0.4		TP03_0.4-0.5						-0.4
0.5				Clayey SAND, red brown, fine to medium, poorly graded, trace fine to medium gravel, trace bitumen (FILL)	D	L	No staining, no odour	-0.5
0.6								-0.6
0.7								-0.7
0.8								-0.8
0.9								-0.9
1				Termination Depth at: 0.9 m. Underground asset discovery.				-1
1.1								-1.1
1.2								-1.2
1.3								-1.3
1.4								-1.4
1.5								-1.5
1.6								-1.6
1.7								-1.7
1.8								-1.8
1.9								-1.9

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense, VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

TEST PIT LOG

ENVIRONMENTAL-TEST PIT

Test Pit TP04

Client SA MFS
Project MFS Angle Park DSI
Project No. 12616808
Site Angle Park MFS
Location 456 Grand Junction Road
Date Drilled 24/10/2023

Contractor A&J Civils
Machine Backhoe
Total Depth (m) 2.0
Pit Width (m) 0.5
Pit Length (m) 2.0

Elevation 4 m AHD
Logged By TW
Checked By AR

Depth (m)	PID (ppm)	Sample ID	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
0		TP04_0-0.2		Clayey sandy GRAVEL, brown, fine to coarse grained gravel, poorly graded trace bitumen (FILL)	D	L	No staining, no odour	0
0.3				Clayey gravelly SAND, brown, fine to medium grained, poorly graded, subangular, poorly graded, fine to medium gravel (FILL)	D	L	No staining, no odour	-0.3
0.5				Gravelly SAND brown, fine to medium, poorly graded, subangular, fine to coarse, poorly graded gravel (FILL)	D	L	No staining, no odour	-0.5
0.9		TP04_0.9-1.0						-0.9
1				sandy CLAY, red-brown, low to medium plasticity, fine to medium, poorly graded sand (NATURAL)	SM	F	No staining, no odour	-1
1.6				Sandy CLAY, pale brown, low plasticity, with trace gravel (NATURAL)	SM	F	No staining, no odour	-1.6
1.9		TP04_1.9-2.0						-1.9
2				Termination Depth at: 2.00 m. Target depth achieved				-2

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense, VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

TEST PIT LOG

ENVIRONMENTAL-TEST PIT

Test Pit TP05

Client SA MFS
Project MFS Angle Park DSI
Project No. 12616808
Site Angle Park MFS
Location 456 Grand Junction Road
Date Drilled 24/10/2023

Contractor A&J Civils
Machine Backhoe
Total Depth (m) 2.0
Pit Width (m) 0.5
Pit Length (m) 1.5

Elevation 4 m AHD
Logged By TW
Checked By AR

Depth (m)	PID (ppm)	Sample ID	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
0		TP05_0.0-0.2		Clayey sandy GRAVEL, brown, fine to coarse grained gravel, poorly graded trace bitumen, concrete, brick, organic matter (wood, root fibres and leaf) (FILL)	D	L	No staining, no odour	0
0.4		TP05_0.4-0.5		Clayey gravelly SAND, brown, fine to medium grained, poorly graded, subangular, poorly graded, fine to medium gravel, trace white mottling (FILL)	D	L	No staining, no odour	-0.4
0.7				sandy CLAY, red-brown, low to medium plasticity, fine to medium, poorly graded sand (NATURAL)	SM	L	No staining, no odour	-0.7
1.1				Sandy CLAY, pale brown, low plasticity, with trace gravel (NATURAL)	SM	F	No staining, no odour	-1.1
1.4		TP05_1.4-1.5						-1.4
2				Termination Depth at: 2.00 m				-2

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense, VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

TEST PIT LOG

ENVIRONMENTAL-TEST PIT

Test Pit TP06

Client SA MFS
Project MFS Angle Park DSI
Project No. 12616808
Site Angle Park MFS
Location 456 Grand Junction Road
Date Drilled 24/10/2023

Contractor A&J Civils
Machine Backhoe
Total Depth (m) 2.0
Pit Width (m) 0.5
Pit Length (m) 1.5

Elevation 4 m AHD
Logged By TW
Checked By AR

Depth (m)	PID (ppm)	Sample ID	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
0		TP06_0.0-0.2		Gravelly SAND, brown, fine to medium grained, poorly graded, subangular, fine to coarse, poorly graded gravel, trace organic matter (root fibers) (FILL)	D	L	No staining, no odour	0
0.3				Clayey gravelly SAND, brown, fine to medium grained, poorly graded, fine to coarse, subangular, poorly graded gravel, white mottling (FILL)	D	L	No staining, no odour	-0.3
0.4		TP06_0.4-0.5						-0.4
0.6				Gravelly clayey SAND, dark brown, fine to medium grained, poorly graded, subangular, fine to medium, poorly graded gravel, trace glass (REWORKED NATURAL)	D	L	No staining, no odour	-0.6
0.9		TP06_0.9-1.0						-0.9
1				Sandy CLAY, red with dark brown, low plasticity, with trace fine gravel	SM	F	No staining, no odour	-1
1.5				Sandy CLAY, pale brown, low plasticity, with trace fine gravel	SM	F	No staining, no odour	-1.5
2				Termination Depth at: 2.00 m. Target depth achieved.				-2

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense, VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

TEST PIT LOG

ENVIRONMENTAL-TEST PIT

Test Pit TP07

Client MFS; SA MFS
Project MFS Angle Park DSI; MFS Statewide PFAS Sampling DB
Project No. 12616808; 331908001
Site Angle Park MFS
Location 456 Grand Junction Road
Date Drilled 24/10/2023

Contractor A&J Civils
Machine Backhoe
Total Depth (m) 2.0
Pit Width (m) 0.5
Pit Length (m) 2.0

Elevation 4 m AHD
Logged By TW
Checked By AR

Depth (m)	PID (ppm)	Sample ID	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
0		TP07_0.0-0.2		Gravelly SAND brown, fine to medium, poorly graded, subangular, fine to coarse, poorly graded gravel, trace organic matter (root fibers) (FILL)			No staining, no odour	0
0.3				Gravelly SAND dark grey to black, fine to medium, poorly graded, subangular, fine to medium, poorly graded gravel (FILL)			No staining, no odour. Unable to be sampled due to test pit depth.	-0.3
0.4				Gravelly SAND brown, fine to medium, poorly graded, subangular, fine to coarse, poorly graded gravel, trace organic matter, large amounts of concrete rubble (FILL)			No staining, no odour	-0.4
1				Sandy CLAY, orange-brown, low to medium plasticity, fine to medium, poorly graded sand			No staining, no odour	-1
1.4		TP07_1.4-1.5						-1.4
1.9		TP07_1.9-2.0						-1.9
2				Termination Depth at: 2.00 m. Target depth achieved.				-2

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense, VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

TEST PIT LOG

ENVIRONMENTAL-TEST PIT

Test Pit TP08

Client SA MFS
Project MFS Angle Park DSI
Project No. 12616808
Site Angle Park MFS
Location 456 Grand Junction Road
Date Drilled 24/10/2023

Contractor A&J Civils
Machine Backhoe
Total Depth (m) 2.0
Pit Width (m) 0.5
Pit Length (m) 1.5

Elevation 4 m AHD
Logged By TW
Checked By AR

Depth (m)	PID (ppm)	Sample ID	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
0		TP8_0.0-0.2		Gravelly SAND brown, fine to medium, poorly graded, subangular, fine to coarse, poorly graded gravel, trace organic matter (root fibers) (FILL)	D	L	No staining, no odour	0
0.3				Gravelly SAND dark grey to black, fine to medium, poorly graded, subangular, fine to medium, poorly graded gravel (FILL)	D	L	No staining, no odour. Unable to be sampled due to test pit depth.	-0.3
0.4		TP08_0.4-0.5		Gravelly SAND brown, fine to medium, poorly graded, subangular, fine to coarse, poorly graded gravel, trace organic matter, large amounts of concrete rubble (FILL)	D	L	Metal reo bar, concrete slabs, refuse (boot soles)	-0.4
0.9		TP08_0.9-1.0						-0.9
1				Sandy CLAY, orange-brown, low to medium plasticity, fine to medium, poorly graded sand	SM	F	No staining, no odour	-1
2				Termination Depth at: 2.00 m. Target depth achieved.				-2

Notes

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Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense, VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

TEST PIT LOG

ENVIRONMENTAL-TEST PIT

Test Pit TP09

Client SA MFS
Project MFS Angle Park DSI
Project No. 12616808
Site Angle Park MFS
Location 456 Grand Junction Road
Date Drilled 24/10/2023

Contractor A&J Civils
Machine Backhoe
Total Depth (m) 2.0
Pit Width (m) 0.5
Pit Length (m) 2.0

Elevation 4 m AHD
Logged By TW
Checked By AR

Depth (m)	PID (ppm)	Sample ID	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
0		TP09_0.0-0.2		Gravelly SAND, brown, fine to medium, poorly graded, subangular, fine to coarse, poorly graded gravel (FILL)	D	L	No staining, no odour	0
0.3				Gravelly clayey SAND, brown, fine to medium grained, poorly graded, subangular, fine to medium gravel, with bitumen and ash (FILL)	D	L	No staining, no odour	-0.3
0.4		TP09_0.4-05						-0.4
0.7				Clayey SAND, red to brown, fine to medium grained, poorly graded trace bitumen (REWORKED NATURAL)	D	L	No straining, no odour	-0.7
0.9		TP09_0.9-1.0						-0.9
1.2				Sandy CLAY, red to brown, low plasticity, trace white mottling (NATURAL)	SM	F	No staining, no odour	-1.2
1.5				Sandy CLAY, brown, low plasticity (NATURAL)	SM	F	No staining, no odour	-1.5
2				Termination Depth at: 2.00 m				-2

Notes

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Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense, VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

TEST PIT LOG

ENVIRONMENTAL-TEST PIT

Test Pit TP10

Client SA MFS
Project MFS Angle Park DSI
Project No. 12616808
Site Angle Park MFS
Location 456 Grand Junction Road
Date Drilled 24/10/2023

Contractor A&J Civils
Machine Backhoe
Total Depth (m) 2.0
Pit Width (m) 0.5
Pit Length (m) 1.5

Elevation 4 m AHD
Logged By TW
Checked By AR

Depth (m)	PID (ppm)	Sample ID	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
0		TP10_0.0-0.2		Clayey sandy GRAVEL, brown, fine to coarse grained gravel, poorly graded trace bitumen, concrete, brick, organic matter (wood, root fibres and leaf) (FILL)	D	L	No staining, no odour	0
0.2				Clayey SAND, pale tan, fine to medium grained, poorly graded, with some gravel, subangular, fine to coarse,	D	L	No staining, no odour	-0.2
0.5		TP10_0.5-0.6		Gravelly SAND dark grey to black, fine to medium, poorly graded, subangular, fine to medium, poorly graded gravel (FILL)	D	L	No staining, no odour	-0.5
0.7				Clayey SAND, brown, fine to medium grained, poorly graded, trace fine to medium gravel (NATURAL)	SM	F	No staining, no odour	-0.7
1.3				Sandy gravelly CLAY, brown, low plasticity, subangular, fine to medium gravel, poorly graded (NATURAL)	SM	F	No staining, no odour	-1.3
1.6				Sandy CLAY, brown, low plasticity, trace fine to medium gravel (NATURAL)	SM	F	No staining, no odour	-1.6
2				Termination Depth at: 2.00 m. Target depth achieved.				-2

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense, VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

TEST PIT LOG

ENVIRONMENTAL-TEST PIT

Test Pit TP11

Client SA MFS
Project MFS Angle Park DSI
Project No. 12616808
Site Angle Park MFS
Location 456 Grand Junction Road
Date Drilled 24/10/2023

Contractor A&J Civils
Machine Backhoe
Total Depth (m) 2.0
Pit Width (m) 0.5
Pit Length (m) 1.5

Elevation 4 m AHD
Logged By TW
Checked By AR

Depth (m)	PID (ppm)	Sample ID	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
0		TP11_0.0-0.2		FILL: clayey sandy GRAVEL, pale brown, fine to coarse grained gravel, subangular, fine to medium sand, poorly graded	D	L	No staining, no odour	0
0.4		TP11_0.4-0.5		FILL: sandy GRAVEL, black, fine to medium gravel, subangular, with white mottling	D	L	Black stained, ash layer, no odour	-0.4
0.6				clayey SAND, brown, fine grained, poorly graded, trace fine to medium gravel	SM	L	No staining, no odour	-0.6
0.9		TP11_0.9-1.0						-0.9
1				sandy CLAY, red-brown, low to medium plasticity, fine to medium, poorly graded sand	SM	F	No staining, no odour	-1
2				Termination Depth at: 2.00 m. Target depth achieved.				-2

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense, VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

TEST PIT LOG

ENVIRONMENTAL-TEST PIT

Test Pit TP12

Client SA MFS
Project MFS Angle Park DSI
Project No. 12616808
Site Angle Park MFS
Location 456 Grand Junction Road
Date Drilled 24/10/2023

Contractor A&J Civils
Machine Backhoe
Total Depth (m) 2.0
Pit Width (m) 0.5
Pit Length (m) 1.5

Elevation 4 m AHD
Logged By TW
Checked By AR

Depth (m)	PID (ppm)	Sample ID	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
0		TP12_0.0-0.2		Gravelly SAND, pale brown, fine to medium, poorly graded, subangular, fine to coarse, poorly graded gravel (FILL)	D	L	No staining, no odour	0
0.3				Gravelly SAND, dark grey to black, fine to medium, poorly graded, subangular, fine to medium, poorly graded gravel (FILL)	D	L	No staining, no odour	-0.3
0.6		TP12_0.6-0.7						-0.6
0.8				Sandy CLAY, red brown, low plasticity, fine to medium grained, poorly graded, trace fine gravel, trace white mottling (NATURAL)	SM	F	No staining, no odour	-0.8
1.2				Sandy CLAY, brown, low plasticity, fine to medium grained sand, poorly graded (NATURAL)	SM	F	No staining, no odour	-1.2
1.6				Sandy gravelly CLAY, red brown, low plasticity, subangular, fine to medium gravel, poorly graded (NATURAL)	SM	F	No staining, no odour	-1.6
1.9		TP12_1.9-2.0						-1.9
2				Termination Depth at: 2.00 m. Target depth achieved.				-2

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense, VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

TEST PIT LOG

ENVIRONMENTAL-TEST PIT

Test Pit TP14

Client SA MFS
Project MFS Angle Park DSI
Project No. 12616808
Site Angle Park MFS
Location 456 Grand Junction Road
Date Drilled 24/10/2023

Contractor A&J Civils
Machine Backhoe
Total Depth (m) 2.0
Pit Width (m) 0.5
Pit Length (m) 1.5

Elevation 4 m AHD
Logged By TW
Checked By AR

Depth (m)	PID (ppm)	Sample ID	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
0		TP14_0.0-0.2		FILL: gravelly SAND brown, fine to medium, poorly graded, subangular, fine to coarse, poorly graded gravel, trace organic matter (root fibers)	D	L	No staining, no odour	0
0.3				Clayey SAND, red brown, fine to medium, poorly graded, trace fine to medium gravel	D	L	No staining, no odour	-0.3
0.4		TP14_0.4-0.5						-0.4
0.6				Sandy CLAY, orange-brown, low to medium plasticity, fine to medium, poorly graded sand	SM	F	No staining, no odour	-0.6
0.9		TP14_0.9-1.0						-0.9
2				Termination Depth at: 2.00 m. Target depth achieved.				-2

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense, VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

TEST PIT LOG

ENVIRONMENTAL-TEST PIT

Test Pit TP15

Client SA MFS
Project MFS Angle Park DSI
Project No. 12616808
Site Angle Park MFS
Location 456 Grand Junction Road
Date Drilled 24/10/2023

Contractor A&J Civils
Machine Excavation
Total Depth (m) 2.0
Pit Width (m) 0.5
Pit Length (m) 1.5

Elevation 4 m AHD
Logged By TW
Checked By AR

Depth (m)	PID (ppm)	Sample ID	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
0		TP15_0.0-0.2		Gravelly SAND, pale brown, fine to medium, poorly graded, subangular, fine to coarse, poorly graded gravel, trace organic matter (root fibers) (FILL)	D	L	No staining, no odours	0
0.2				Gravelly SAND, dark grey to black, fine to medium, poorly graded, subangular, fine to medium, poorly graded gravel (FILL)	D	L	No staining, no odours	-0.2
0.6		TP15_0.6-0.7						-0.6
0.7				Sandy CLAY, brown, low plasticity, fine to medium grained sand, poorly graded (NATURAL)	SM	F	No staining, no odours	-0.7
1.2				Sandy gravelly CLAY, brown, low plasticity, subangular, fine to medium gravel, poorly graded (NATURAL)	SM	F	No staining, no odours	-1.2
1.4		TP15_1.4-1.5						-1.4
1.5				Sandy CLAY, dark brown, low plasticity, trace fine to medium gravel (NATURAL)	SM	F	No staining, no odours	-1.5
2				Termination Depth at: 2.00 m. Target depth achieved.				-2

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense, VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

TEST PIT LOG

ENVIRONMENTAL-TEST PIT

Test Pit TP16

Client SA MFS
Project MFS Angle Park DSI
Project No. 12616808
Site Angle Park MFS
Location 456 Grand Junction Road
Date Drilled 24/10/2023

Contractor A&J Civils
Machine Backhoe
Total Depth (m) 2
Pit Width (m) 0.5
Pit Length (m) 2

Elevation 4 m AHD
Logged By TW
Checked By AR

Depth (m)	PID (ppm)	Sample ID	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
0		TP16_0.0-0.1		Gravelly SAND, brown, fine to medium, poorly graded, subangular, fine to coarse, poorly graded gravel, trace organic matter (root fibers) (FILL)	D	L	No staining, no odour	0
0.1				FILL: Gravelly SAND, dark grey to black, fine to medium, poorly graded, subangular, fine to medium, poorly graded gravel (FILL)	D	L	No staining, no odour	-0.1
0.9		TP16_0.9-1.0		Sandy CLAY, brown, fine to medium, poorly graded, subangular, fine to medium, poorly graded gravel, grey mottling (NATURAL)	SM	L	No staining, no odour	-0.9
1.1				Sandy CLAY, pale brown, low plasticity, fine to medium, poorly graded (NATURAL)	SM	F	No staining, no odour	-1.1
1.5				Sandy CLAY, red brown, low plasticity, fine to medium, poorly graded (NATURAL)	SM	L	No staining, no odour	-1.5
1.9		TP16_1.9-2.0						-1.9
2				Termination Depth at: 2.00 m. Target depth achieved.				-2

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense, VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

TEST PIT LOG

ENVIRONMENTAL-TEST PIT

Test Pit TP17

Client SA MFS
Project MFS Angle Park DSI
Project No. 12616808
Site Angle Park MFS
Location 456 Grand Junction Road
Date Drilled 24/10/2023

Contractor A&J Civils
Machine Excavator
Total Depth (m) 2
Pit Width (m) 0.5
Pit Length (m) 1.5

Elevation 4 m AHD
Logged By TW
Checked By AR

Depth (m)	PID (ppm)	Sample ID	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
0		TP17_0.0-0.2		FILL: clayey sandy GRAVEL, brown, fine to coarse grained gravel, trace concrete and organic matter (wood and root fibers)	D	L	No odour, no staining	0
0.4		TP17_0.4-0.5		FILL: gravelly SAND, fine to medium, poorly graded, dark grey to black, subangular, fine to medium, poorly graded gravel	SM	L	No odour, no staining	-0.4
0.6				sandy CLAY low to medium plasticity, red- brown, fine to medium, poorly graded sand	SM	F	No odour, no staining	-0.6
0.9		TP17_0.9-1.0						-0.9
1				sandy CLAY, red brown to tan, low plasticity, trace fine grained gravel	SM	F	No odour, no staining	-1
1.4		TP17_1.4-1.5						-1.4
1.9		TP17_1.9-2.0						-1.9
2				Termination Depth at: 2.00 m				-2

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense, VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

TEST PIT LOG

ENVIRONMENTAL-TEST PIT

Test Pit TP18

Client SA MFS
Project MFS Angle Park DSI
Project No. 12616808
Site Angle Park MFS
Location 456 Grand Junction Road
Date Drilled 24/10/2023

Contractor A&J Civils
Machine Excavator
Total Depth (m) 2
Pit Width (m) 0.5
Pit Length (m) 1.5

Elevation 4 m AHD
Logged By TW
Checked By AR

Depth (m)	PID (ppm)	Sample ID	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
0		TP18_0.0-0.2		Gravelly SAND, brown, fine to medium, poorly graded, subangular, fine to coarse, poorly graded gravel, trace organic matter (root fibers) (FILL)	D	L	No staining, no odour	0
0.4				Gravelly SAND, dark grey to black, fine to medium, poorly graded, subangular, fine to medium, poorly graded gravel (FILL)	D	L	No staining, no odour	-0.4
0.9		TP18_0.9-1.0						-0.9
1				Sandy CLAY, brown, low palsticity, fine to medium grained sand, poorly graded (NATURAL)	SM	F	No staining, no odour	-1
1.2		TP18_1.2-1.3						-1.2
1.3				Sandy gravelly CLAY, red brown, low plasticity, subangular, fine to medium gravel, poorly graded (NATURAL)	SM	F	No staining, no odour	-1.3
1.4		TP18_1.4-1.5						-1.4
1.5				Sandy CLAY, brown, low plasticity, trace fine to medium gravel (NATURAL)	SM	F	No staining, no odour	-1.5
1.9		TP18_1.9-2.0						-1.9
2				Termination Depth at: 2.00 m. Target depth achieved.				-2

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense, VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

TEST PIT LOG

ENVIRONMENTAL-TEST PIT

Test Pit TP22

Client SA MFS
Project MFS Angle Park DSI
Project No. 12616808
Site Angle Park MFS
Location 456 Grand Junction Road
Date Drilled 24/10/2023

Contractor A&J Civils
Machine Backhoe
Total Depth (m) 2.0
Pit Width (m) 0.5
Pit Length (m) 1.5

Elevation 4 m AHD
Logged By TW
Checked By AR

Depth (m)	PID (ppm)	Sample ID	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
0		TP22_0.0-0.2		Gravelly SAND, brown, fine to medium, poorly graded, subangular, fine to coarse, poorly graded gravel, trace organic matter (root fibers) (FILL)	D	L	No staining, no odour	0
0.2				Gravelly SAND, dark grey to black, fine to medium, poorly graded, subangular, fine to medium, poorly graded gravel (FILL)	D	L	No staining, no odour	-0.2
0.4		TP22_0.4-0.5						-0.4
0.9		TP22_0.9-1.0						-0.9
1				Clayey SAND, brown, fine to medium grained, poorly graded, trace fine to medium gravel (NATURAL)	D	L	No staining, no odour	-1
1.1		TP22_1.1-1.2						-1.1
1.2				Sandy gravelly CLAY, brown, low plasticity, subangular, fine to coarse gravel, poorly graded, trace bitumen (NATURAL)	SM	F	No staining, no odour	-1.2
1.5				Sandy CLAY, red, low plasticity, trace fine gravel (NATURAL)	SM	F	No staining, no odour	-1.5
2				Termination Depth at: 2.00 m. Target depth achieved.				-2

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense, VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

TEST PIT LOG

ENVIRONMENTAL-TEST PIT

Test Pit TP23

Client SA MFS
Project MFS Angle Park DSI
Project No. 12616808
Site Angle Park MFS
Location 456 Grand Junction Road
Date Drilled 24/10/2023

Contractor A&J Civils
Machine Backhoe
Total Depth (m) 2.0
Pit Width (m) 0.5
Pit Length (m) 1.5

Easting
Northing
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By
Checked By

Depth (m)	PID (ppm)	Sample ID	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
0.1				Sandy GRAVEL, grey to pale brown, subangular, fine to coarse gravel, poorly graded, fined to medium grained sand, trace organic material (rootlets) (FILL)	D	L	No staining, no odour	-0.1
0.2				Gravelly SAND, dark grey to black, fine to medium, poorly graded, subangular, fine to medium, poorly graded gravel (FILL)	D	L	No staining, no odour	-0.2
0.3								-0.3
0.4								-0.4
0.5								-0.5
0.6								-0.6
0.7								-0.7
0.8								-0.8
0.9				Clayey SAND, brown, fine to medium grained, poorly graded, trace fine to medium gravel (NATURAL)	SM	F	No staining, no odour	-0.9
1								-1
1.1								-1.1
1.2				Sandy CLAY, orange-brown, low plasticity, trace subangular, fine to medium gravel (NATURAL)	SM	F	No staining, no odour	-1.2
1.3								-1.3
1.4								-1.4
1.5								-1.5
1.6				Sandy CLAY, tan brown, low plasticity trace fine gravel	SM	F	No staining, no odour	-1.6
1.7								-1.7
1.8								-1.8
1.9								-1.9
2				Termination Depth at: 2.00 m. Target depth achieved.				-2

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense, VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

Appendix E

Site-Specific Health Investigation Level Methodologies

Crown Tower, Level 11, 200 Crown Street
Wollongong, New South Wales 2500
Australia
www.ghd.com

Our ref: 12602101

28 June 2023

Krystle Mitchell
Senior Scientific and Environment Officer
South Australian Metropolitan Fire Service
99 Wakefield Street
Adelaide, SA 5000

Derivation of site-specific health investigation levels for urban and regional fire stations – South Australia Metropolitan Fire Service (SA MFS)

Dear Krystle,

1. Introduction

This letter describes the derivation of site-specific health investigation levels (SSHILs) for per- and poly-fluoroalkyl substance (PFAS) contaminated soil at fire stations operated by the South Australia Metropolitan Fire Service (SA MFS). SSHILs have been derived for urban and regional settings based on the methodology provided in the following documents: .

- Heads of EPAs Australia and New Zealand (HEPA) and the Australian Government Department of the Environment and Energy (DoEE) – *PFAS National Environmental Management Plan* (the 'PFAS NEMP') (HEPA, 2020)
- National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended 2013 (NEPC, 2013) (the 'ASC NEPM')
- NSW and Office of Environment and Heritage (OEH, 2019) *Human health soil screening criteria for PFOS, PFHxS and PFOA*

1.1 Background

From 2007, SA MFS began phasing out the use of aqueous film-forming foam (AFFF) containing perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) as key constituents, due to concerns regarding the hazards posed by these compounds to human health and the environment. The SA MFS replaced all firefighting foam in 2016 to ensure that only fluorine-free foam was in use. Currently, state-wide, all SA MFS appliances carry firefighting foams that do not contain PFOS or PFOA and are fluorine-free. During 2017/2018, the SA MFS also removed all fire extinguishers containing PFAS. In 2018, SA MFS engaged GHD to provide ongoing environmental services and undertake site contamination assessments across many of their operational sites as well as risk profiling for their entire portfolio of sites to effectively manage the potential for PFAS contamination and any associated human health and ecological risks.

The PFAS NEMP provides generic health investigation levels (HILs) for PFOS, PFOA and perfluorohexane sulfonate (PFHxS) in soil in four land use settings, as summarised in Table 1 below. The land use settings considered in the PFAS NEMP are consistent with those that underpin the HILs presented for a variety of contaminants within the ASC NEPM. The derivation of the PFAS HIL values is described in detail by OEH (2019).

Table 1 Summary of exposure scenarios adopted to derive generic HILs.

Land use	HIL (mg/kg)	Exposure scenario description
HIL A Residential, with gardens /accessible soil	PFOS+PFHxS: 0.01 PFOA: 0.1	- Low-density residential settings with sizeable gardens and with areas of soil that are accessible - Gardens are assumed to consist of lawns, garden beds and small vegetable gardens and areas of fruit trees - Assumes home-grown produce provides up to 10% of fruit and vegetable intake (does not account for consumption of eggs from home poultry) - Site users are adults, children and infants who spend most of their time at home and use the outdoor areas of the residences on a frequent basis for activities such as gardening or recreation. This scenario assumes 20 hours a day spent indoors and 4 hours a day spent outdoors in direct contact with soil. - Children are the most sensitive human receptors. This scenario is protective of childcare centres, kindergartens, preschools and primary schools and their integral playgrounds.
HIL B Residential, with minimal opportunities for soil access	PFOS+PFHxS: 2 PFOA: 20	- High-density residential settings, such as unit blocks, where communal outdoor spaces are largely covered by permanent paving and with some small areas of landscaping or lawns - Assumes that there are minimal opportunities for direct access to soil by residents. There may be some potential for residents to inhale, ingest or come into direct dermal contact with dust particulates derived from the on-site soil. - Assumes no use of soil to produce vegetables, fruit or poultry - Site users are adults, children and infants who spend most of their time indoors with limited use of communal outdoor areas on site. This scenario assumes 20 hours a day spent indoors and 1 hour a day spent outdoors in direct contact with soil. - Children are the most sensitive human receptors
HIL C Public open space	PFOS+PFHxS: 1 PFOA: 10	- Parks, playgrounds, recreational areas and playing fields that are fully accessible to the public - These areas may contain lawns, gardens, vegetated areas, and walkways with some areas of exposed soil - Assumes no use of soil to produce vegetables, fruit or poultry - Site users are adults and children who may use the area for up to 2 hours a day, 7 days a week - Children are the most sensitive human receptors
HIL D Commercial/ industrial	PFOS+PFHxS: 20 PFOA: 50	- Commercial and/or industrial settings where the outdoor areas are largely (80%) covered by hardstand, possibly with some limited areas of landscaping or lawns - Site users are adult employees that spend up to 8 hours a day indoors and 1 hour a day outdoors for up to 240 days per year - There are minimal opportunities for direct access to soil. There is the potential for employees to inhale, ingest or come into direct contact with dust particulates derived from the soil on the site.

A review of Table 1 indicates that the typical usage patterns at SA MFS fire stations most closely align with the exposure assumptions that underpin the HIL D values. The following inconsistencies are however noted:

– The preliminary site investigations undertaken at SA MFS sites across South Australia has identified that some fire stations have a higher proportion of unsealed ground (up to approximately 75% of the total site area) than has been assumed in the derivation of the HIL D values (up to approximately 20% of the total site area). As a result of this, there may be greater opportunities for direct access to soil at SA MFS fire stations, including the ingestion of soil and soil-derived dust.

– The shifts worked by SA MFS firefighters do not align with the assumption of a standard working week than underpins the HIL D values

Given these factors, SSHILs have been derived using exposure assumptions that reflect the typical usage pattern of the SA MFS fire stations, to allow for a more accurate assessment of the health risks that may be associated with the presence of PFAS in shallow soils.

1.2 Objective of this report

The objective of this report is to derive SSHILs for PFOS+PFHxS and PFOA in soils that are protective of workers at SA MFS fire stations in typical urban and regional settings. The purpose of these SSHILs is to facilitate the screening assessment of soil datasets for human health risks.

2. Derivation methodology

The SSHILs have been calculated using the HILs spreadsheet (Excel format) provided on the ASC NEPM website[1]. The algorithms underlying the HILs spreadsheet are detailed in Schedule B7 of the ASC NEPM. These algorithms were also used in the derivation of the HILs PFOS+PFHxS and PFOA, presented in Table 1 and as detailed by OEH (2019).

The process used to derive the SSHILs involved the following key steps:

- ***Toxicity assessment:*** which established the relationships between PFAS exposure and potential health and ecological effects, using published toxicological information
- ***Exposure assessment:*** which produced estimates of the PFAS exposure that may be experienced by users of SA MFS fire stations.
- ***Risk characterisation:*** which combines the results of the toxicity assessment and exposure assessment, to derive soil criteria that are protective of potential risks to the health of users of SA MFS fire stations.

The toxicity assessment and exposure assessment inputs used in the derivation of the SSHILs are detailed herein, with the SSHILs provided in Section 3.

2.1 Toxicity assessment methodology

A toxicity assessment determines whether human exposure to a chemical could cause an increase in the incidence of an adverse health condition (NEPC, 2013). The outcomes of the toxicity assessment process are a set of toxicity criteria that have been used to derive the SSHILs.

For most chemicals there is a dose below which no adverse health effect will occur (i.e., a threshold toxicant). PFAS have been linked with several threshold toxicities, including effects on cholesterol and immunotoxicity. Accordingly, the SSHILs focus on potential threshold risks linked to PFAS exposure. Chronic health risks for threshold chemicals are assessed by comparing the estimated intake with toxicity reference values (TRVs), which are a measure of tolerable daily exposure. The TRVs adopted in the derivation of the SSHILs are consistent with those that underpin the HIL D values presented in the PFAS NEMP, as detailed in Table 2.

The toxicity assessment process also considers the toxicokinetics of PFAS and in particular the tendency of PFAS to be absorbed via the various potential routes of exposure (i.e., ingestion, inhalation and dermal absorption). Consistent with the approach adopted by OEH (2019) the dermal uptake of PFAS has been assumed to be negligible and has not been included in the derivation of the SSHILs.

[1] **https://www.nepc.gov.au/nepms/assessment-site-contamination/toolbox**

Table 2 Summary of toxicological input parameters used in the derivation of the SSHILs.

Chemical	Toxicity assessment input parameters	Source
Toxicity reference values		
PFOS, PFHxS (sum)	20 ng/kg/day	OEH (2019); FSANZ (2017)
PFOA	160 ng/kg/day	OEH (2019); FSANZ (2017)
Absorption parameters		
Dermal absorption	Negligible	OEH (2019)
Gastrointestinal absorption	100%	OEH (2019); FSANZ (2017)

2.2 Exposure assessment methodology

In an exposure assessment, appropriate exposure assumptions are identified for each exposure pathway, and these are used in conjunction with exposure modelling algorithms to estimate intakes of contaminants by the exposed receptors (NEPC, 2013).

The exposure assessment inputs adopted in the derivation of the SSHILs have primarily been sourced from OEH (2019), with adjustments made as appropriate, based on information provided by SA MFS. A summary of the adopted exposure assessment inputs and the rational underpinning the selected values is provided in Attachment 1. These inputs can be summarised as follows:

- *Firefighter physiology*: The ASC NEPM Schedule B7 provides standard exposure parameters for commercial / industrial scenarios, including factors such as the body weight and inhalation characteristics of adult workers. Consistent with the approach adopted by OEH (2019), these have been adopted in the derivation of SSHILs, as SA MFS firefighters will typically be physiologically consistent with the general population.
- *Exposure frequency and time onsite*: Information provided by SA MFS has been used to select appropriate input assumptions around exposure frequency and time spent onsite, as detailed in Section 2.2.1
- *Exposure to PFAS from external sources*: PFAS is present in a variety of domestic products and commercial applications and is ubiquitous in urban settings. Hence, SA MFS firefighters are likely to be exposed to PFAS from a variety of sources external to the fire stations, such as food, air, water and consumer products. The TRVs detailed in Section 2.1 are relevant to the PFAS intake from all sources. The HIL D presented in the PFAS NEMP were derived based on the conservative assumption that 80% of the exposure to PFAS experienced by workers originates from external sources, with 20% of the TRV allocated to PFAS in fire station soils. This conservative assumption has been retained in the derivation of SSHILs for SA MFS firefighters
- *Incidental soil ingestion rates*: The incidental soil ingestion rates for SA MFS firefighters have been assumed to be consistent with those experienced by adults in a residential setting (50 mg/day), rather than those adopted in the ASC NEPM and by OEH (2019) for commercial/industrial sites (25 mg/day). This approach is likely to be conservative but has been adopted to account for the extended shifts worked by firefighters in metropolitan areas and the substantial areas of unsealed ground that are present on some of the SA MFS fire stations.
- *Use of SA MFS fire stations by children*: Children have not been specifically included in the derivation of the SSHILs. It is understood that children do visit the SA MFS fire stations but that this does not occur with regularity. Hence, the SSHILs, which have been derived to be protective of firefighters employed at the fire stations, will also be adequately protective of the health children visiting less frequently.

– *Produce production and consumption*: Historically, produce gardens were present on a number of the SA MFS fire stations and it is understood that there was some concern that the time spent tending these gardens and consuming produce would be associated with increased levels of exposure to PFAS. In 2022 however, SA MFS issued a directive on advice from GHD and EPA that all fruit and vegetable plants be removed from fire stations and replaced with ornamental plants (refer to Attachment 2). Areas of ornamental landscaping are not inconsistent with the exposure assumptions underpinning the HIL D values and therefore adjustments to the exposure assumptions used to derive the SSHILs have not been made on this basis.

2.2.1 Firefighter shifts

As noted in Table 1, the generic HIL D values assume that workers spend up to 240 days a year at commercial/industrial sites: eight hours a day indoors and one hour a day outdoors. This is equivalent to a total yearly exposure of 2160 hours. Given that the shifts worked by firefighter in both urban and regional areas differ from this pattern, the specific exposure times provided by SA MFS have been adopted in the derivation of the SSHILs as follows:

– Metropolitan fire stations – SA MFS has indicated that firefighters typically work two 10-hour dayshifts and two 14-hours nightshifts followed by four days off work and that firefighters work for 6 months before taking 6 weeks of annual leave. This averages to 12-hour shifts for circa 150 days per year. This is equivalent to a total yearly exposure of 1800 hours, which is lower than the exposure assumption underpinning the generic HIL D values.
– Regional fire stations – SA MFS has indicated that firefighters can spend up to three hours a week at regional fire stations. This is equivalent to a total yearly exposure of 156 hours per year, which is substantially lower than the exposure assumption underpinning the generic HIL D.

3. Site-specific HILs for the screening of PFAS contaminated soils at SA MFS sites

The input parameters selected via the toxicity assessment and exposure assessment processes, as detailed in Sections 2.1 and 2.2 respectively, have been combined to calculate SSHILs for the screening of PFAS contaminated soils at SA MFS fire stations. The models used to calculate the SSHILs are presented in Attachment 3 and Table 3 summarises the derived SSHIL values.

Table 3 SSHILs derived for the screening of PFAS contaminated soil in urban and regional SA MFS fire stations

Fire station type	PFOS+PFHxS	PFOA*	Comment
Metropolitan	14 mg/kg	50 mg/kg	These SSHILs assumes four 12-hour shifts every eight days (i.e., four days at work and four days off)
Regional	40 mg/kg	50 mg/kg	These SSHILs assumes one 3-hour shift per week.
Notes: Although higher values were calculated using the toxicity and exposure assessment process, the SSHIL for PFOA has been set as 50 mg/kg in anticipation of the Stockholm Convention low content limit. This is consistent with the PFAS NEMP			

4. Closure

We trust that the information above is sufficient for SA MFS's purposes. Should you have any further questions on this document please do not hesitate to contact the undersigned.

Regards

Davide Menozzi
Senior Environmental Scientist
davide.menozzi@ghd.com

Ben Petticrew
Technical Director
ben.petticrew@ghd.com

5. References

FSANZ. (2017). *Food Standards Australia New Zealand's (FSANZ) report on Perfluorinated Chemicals in Food.*

HEPA. (2020). *PFAS National Environmental Management Plan - Version 2.0* .

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Amendment Measure* .

OEH. (2019). *Human health soil screening criteria for PFOS, PFHxS and PFOA.*

Attachments

Attachment 1

Summary of exposure assessment inputs

Summary of SA MFS sites - unsealed areas

Location (metro)	Unsealed area (m^2)	Total area (m^2)	% unsealed
Angle park	111254	153034	73%
Adelaide	115	20000	1%
St Marys	1229	4543	27%
Largs	1163	3316	35%
Woodville	141	2172	6%
Christie Downs	710	2321	31%
Camden Park	531	2771	19%
Oakden	1302	4802	27%
Port Adelaide	449	4349	10%
O'Halloran Hill	2959	7300	41%
Brooklyn Park	1090	3710	29%
Beulah Park	335	2791	12%
Elizabeth	100	3256	3%
Gawler	1300	3457	38%
Glen Osmond	180	3152	6%
Golden Grove	1172	3994	29%
Paradise	680	4090	17%
Prospect	580	2820	21%
Salisbury	2442	12607	19%
Seaford	2300	7450	31%
Mount Barker	362	2110	17%
	Unsealed Average	**Total Area Average**	**% average**
	815	4,913	17%
Max	111254	153034	73%
Min	100	2110	1%

Location (regional)	Unsealed area (m^2)	Total area (m^2)	% unsealed
Loxton	987	2154	46%
Moonta	1	920	0%
Whyalla	6224	11054	56%
Mt Gambier	1506	3884	39%
Kapunda	1	395	0%
Peterborough	519	994	52%
Port Pirie	7875	19297	41%
Port Augusta	961	2461	39%
Murray Bridge	796	2005	40%
Berri	583	3065	19%
Kadina	1	577	0%
Port Lincoln	420	6058	7%
Renmark	70	3573	2%
Tanunda	168	1438	12%
Victor Harbor	400	1847	22%
Wallaroo	1032	1600	65%
	Unsealed Average	**Total Area Average**	**% average**
	222	2,276	10%
Max	7875	19297	65%
Min	1	395	0%

Summary of exposure parameters

Summary of Exposure Parameters	units	Parameter			Rationale
		HIL D	SA MFS SSHIL - Urban	SA MFS SSHIL - Regional	
Soil and Dust Ingestion Rate	mg/day	25	50	50	HIL D assumes that the incidential soil ingestion rate experienced by adults working for 8-hours on a commercial industrial site (25 mg/day) is likely to be ~50% of that experienced by adults in a residential setting (50 mg/day), given that waking hours are typically ~16-hours per day. The ASC NEPM residential soil ingestion rate has been adopted for SA MFS firefighters, given that substantial areas of unsealed ground are present on some of the SA MFS fire stations and firefighters may spend significant periods of time outdoors. This assumption is likely to be conservative for firefighters in regional settings, who typically spend less time onsite
Time Spent Outdoors	hours	1	4	2	HIL D assumes a standard 8-hour working day, with minimal time spent outdoors. MFS SA has indicated that: - firefighters in metropolitan locations typically work 12-hour shifts - firefighters in regional locations typically work 3-hour shifts It has also been assumed that firefighters may spend significant amounts of time outdoors, undertaking activities such as training and equipment and facility maintenance
Time Spent Indoors	hours	8	8	1	
Lung Retention Factor	-	0.375	0.375	0.375	ASC NEPM default, as detailed in Schedule B7. Describes the percentage of dust that is small enough to be inhaled.
Particulate Emission Factor	(m^3/kg)	3.70E+10	9.7E+09	9.7E+09	Calculated as described in Schedule B7 of the ASC NEPM. For HIL D, up to 20% of the site is assumed to be open ground. For the SA MFS fire stations up to 75% of the site is assumed to be open ground
Indoor Air Dust Factor	(m^3/kg)	2.6E+07	2.6E+07	2.6E+07	ASC NEPM default, as described in Schedule B7. The indoor dust concentration is assumed to be equal to the 95th percentile from Australian data (enHealth 2012; 39 µg/m^3), noting that indoor air can be enriched with dust compared to the outdoor environment, due to the movement of dust indoors on clothing, footwear etc.
Fraction of indoor dust comprised of outdoor soil	-	0.5	0.5	0.5	ASC NEPM default, as described in Schedule B7. Assume 50% of indoor dust is comprised of soi tracked into the building
Body weight	kg	70	70	70	ASC NEPM default, as described in Schedule B7.
Exposure Frequency	days/year	240	140	52	HIL D assumes a 5-day working week for 48 weeks per year. MFS has indicated that - firefighters in metropolitan stations typically work four shifts every eight days - firefighters in regional stations typically work one 3-hour shift per week
Exposure Duration	years	30	30	30	ASC NEPM default, as described in Schedule B7. Note that this parameter does not influence the derived HIL for threshold chemicals, as exposure is averaged over the exposure duration.
Averaging Time (ingestion)	days	10950	10950	10950	Calculated based on the exposure duration. Multiplied by 24 hours for the assessment of inhalation exposures
Averaging Time (inhalation)	hours	262800	262800	262800	

Attachment 2

SA MFS directive on the removal of produce

Government of South Australia

SOUTH AUSTRALIAN METROPOLITAN FIRE SERVICE

MEMORANDUM NO. 77/2022

METROPOLITAN FIRE SERVICE SOUTH AUSTRALIA

29 September 2022

FRUIT AND VEGETABLE GARDEN REMOVAL FROM ALL MFS STATIONS

MFS is directing all MFS stations to remove all fruit and vegetable gardens from MFS stations.

This is required to be completed by the **31st of October 2022**.

Garden waste can be disposed of as per the normal station procedures to dispose of this sort of waste. Where this is not practicable due to volume, please contact your Commander to arrange for an alternative solution, such as the provision of the high sided/skip pod.

If the fruit and vegetable garden cannot be removed by station personnel, please advise via the mfspfas@sa.gov.au. That email is to contain an audit of all fruit/vegetable trees that require removal by external contractors prior to 21 October 2022. The MFS will then arrange for these to be removed.

All fruit and vegetable gardens are required to be removed as the EPA see the presence of fruit and vegetable trees on fire stations as a possible human receptor to PFAS (even if you are not consuming the fruit and vegetables from them).

The MFS will provide ornamental plants and vegetation to replace the plants pulled out up to a value of $100 on application. Applications from each station can be sent to mfspfas@sa.gov.au. Approval will then be forwarded to the relevant Metropolitan/Regional Commander to use their credit card to purchase the goods.

Metropolitan and Regional Commanders are to ensure that there are no fruit and vegetable gardens remaining at their relevant stations after the 31st of October 2022.

C Shift is responsible under the Station Management System - Station Administration, to ensure that this document is read, signed, placed on the Notice Board and filed.

Staff are reminded that the current SAPs, SOPs, Policies, SP Forms, Memorandums, Service Directives and Operational Procedures are available on the Members Only Website (MOW). This is a directive from the Chief Officer.

SIGNED

M. Morgan
CHIEF OFFICER and
CHIEF EXECUTIVE

ACTION	DATE	SIGN
Instruction received at Station		
Instruction read to “A” Shift		
Instruction read to “B” Shift		
Instruction read to “C” Shift		
Instruction read to “D” Shift		
Instruction read to Retained Staff		
Instruction read to OTR		
Placed on Notice Board		
Filed in Station File		

Attachment 3

SSHILs modelling inputs and outputs.

Derivation of Site specific health investigation levels

Firefighters at regional fire stations - South Australian Metropolitan Fire Service

Summary of Exposure Parameters	Abbreviation	units	Parameter	References/Notes
Soil and Dust Ingestion Rate - Adults	IR_{SA}	mg/day	50	Site-specific assumption: Consistent with assumption adopted for adults in residential settings
Time Spent Outdoors	ETo	hours	1	Site-specific assumption; 3-hour shifts during which 1 hour is spent outdoors.
Time Spent Indoors	ETi	hours	2	Site-specific assumption; 3-hour shifts during which 2 hours are spent indoors.
Lung Retention Factor	RF	-	0.375	ASC NEPM default assumption
Particulate Emission Factor	PEFo	(m^3/kg)	9.7E+09	Calculated: Based on the site-specific assumption that up to 75% of individual sites is open ground
Indoor Air Dust Factor	PEFi	(m^3/kg)	2.6E+07	ASC NEPM default assumption
Fraction of indoor dust comprised of outdoor soil	TF	-	0.5	ASC NEPM default
Body weight - Adults	BW_C	kg	70	ASC NEPM default
Exposure Frequency	EF	days/year	52	Site-specific assumption: One shift per week
Exposure Duration - Adults	ED_C	years	30	ASC NEPM default assumption
Averaging Time (non-carcinogenic)	AT_T	days	ED*365	Calculated based on ED for each relevant age group, multiplied by 24 hours for the assessment of inhalation exposures

Threshold Calculations - Adult Worker

Compound	Toxicity Reference Value Oral (TRV_O) (mg/kg/day)	GI Absorption (GAF) (unitless)	Toxicity Reference Value Dermal (TRV_D) (mg/kg/day)	Oral Bioavailability BA_O (%)	Dermal Absorption Factor (DAF) (unitless)	Background Intake Oral/Dermal (BI_O) (% of TDI)	Toxicity Reference Value Inhalation (TRV_I) (mg/m^3)	Background Intake Inhalation (BIi) (% of TC)		Pathway Specific HILs (mg/kg)			Derived Soil HIL (not rounded) (mg/kg)
										Soil Ingestion	Dermal	Dust	
PFOS+PFHxS	0.00002	1	0.00002	100%	-	80%	0.00007	0%		3.9E+01	NA	8.0E+05	39
PFOA	0.00016	1	0.00016	100%	-	80%	0.00056	0%		3.1E+02	NA	6.4E+06	314

NA Pathway not of significance for chemical assessed

Derivation of Site specific health investigation levels

Fire fighters at metropolitan fire stations - South Australian Metropolitan Fire Service

Summary of Exposure Parameters	Abbreviation	units	Parameter	References/Notes
Soil and Dust Ingestion Rate - Adults	IR_{SA}	mg/day	50	Site-specific assumption: Consistent with assumption adopted for adults in residential settings
Time Spent Outdoors	ETo	hours	4	Site-specific assumption; 12-hour shifts during which 4 hours are spent outdoors.
Time Spent Indoors	ETi	hours	8	Site-specific assumption; 12-hour shifts during which 8 hours are spent indoors.
Lung Retention Factor	RF	-	0.375	ASC NEPM default assumption
Particulate Emission Factor	PEFo	(m^3/kg)	9.7E+09	Calculated: Based on the site-specific assumption that up to 75% of individual sites is open ground
Indoor Air Dust Factor	PEFi	(m^3/kg)	2.6E+07	ASC NEPM default assumption
Fraction of indoor dust comprised of outdoor soil	TF	-	0.5	ASC NEPM default
Body weight - Adults	BW_C	kg	70	ASC NEPM default
Exposure Frequency	EF	days/year	146	Site-specific assumption: Four shifts every eight days (i.e., four days at work and four days off)
Exposure Duration - Adults	ED_C	years	30	ASC NEPM default assumption
Averaging Time (non-carcinogenic)	AT_T	days	ED*365	Calculated based on ED, multiplied by 24 hours for the assessment of inhalation exposures

Threshold Calculations - Adult Worker

Compound	Toxicity Reference Value Oral (TRV_O) (mg/kg/day)	GI Absorption (GAF) (unitless)	Toxicity Reference Value Dermal (TRV_D) (mg/kg/day)	Oral Bioavailability BA_O (%)	Dermal Absorption Factor (DAF) (unitless)	Background Intake Oral/Dermal (BI_O) (% of TDI)	Toxicity Reference Value Inhalation (TRV_I) (mg/m^3)	Background Intake Inhalation (BIi) (% of TC)		Pathway Specific HILs (mg/kg)			Derived Soil HIL (not rounded) (mg/kg)
										Soil Ingestion	Dermal	Dust	
PFOS+PFHxS	0.00002	1	0.00002	100%	-	80%	0.00007	0%		1.4E+01	NA	7.2E+04	14
PFOA	0.00016	1	0.00016	100%	-	80%	0.00056	0%		1.1E+02	NA	5.7E+05	112

NA Pathway not of significance for chemical assessed

Appendix F

Well Permits

Government of South Australia
Department for Environment and Water

Water and River Murray Group
Water Licensing Branch
11 Helen Street
Mount Gambier SA 5290
PO Box 1046
Mount Gambier SA 5290
Australia
Tel (08) 8735 1134

dew.lcwaterlicensing@sa.gov.au
www.environment.sa.gov.au
www.waterconnect.sa.gov.au

TO THE WELL CONSTRUCTION PERMIT HOLDER

Your well construction permit, which is valid for **12 months** from the date of issue is enclosed. A licensed driller must carry out the work on your well in accordance with the enclosed general specifications and permit conditions. A licensed driller includes the holder of a South Australian well drillers licence, or a holder of an interstate drillers licence who has registered to work in South Australia under Automatic Mutual Recognition using the Automatic recognition of licences | Consumer and Business Services | South Australia (cbs.sa.gov.au)

Compliance with these provisions will protect the state's underground water resources and ensure successful completion of the well. The driller is also required to collect a water sample from your well which will be tested for salinity content and test results can be found on the Ground Water Data System by going to www.waterconnect.sa.gov.au.

Please note that if you are in a prescribed wells area the following definitions of stock and domestic apply:

- **Stock:** The provision of drinking water for grazing stock only (i.e. stock not subject to intensive farming).
- **Domestic:** For ordinary household purposes and includes the watering of a garden used in conjunction with a dwelling and not exceeding 0.4 hectares.

If you intend to use water from the proposed well for domestic or human consumption use, it is recommended that you undertake your own water quality testing prior to using the groundwater supply.

THE PERMIT IS NOT TRANSFERABLE. If the property upon which the permit work is to be undertaken is sold, the new land owner must make application for another permit prior to the commencement of any work.

In South Australia, native vegetation is protected by the *Native Vegetation Act 1991*. Clearance includes the draining or flooding of land, including actions that result in the substantial damage to native vegetation, this might include activities that lower the water tables and as a result impact on water dependant wetland communities. In most cases the clearance of native vegetation requires the consent of the Native Vegetation Council. For Further information regarding native vegetation clearance approvals, is available from: http://www.environment.sa.gov.au/managing-natural-resources/native-vegetation .

Under Section 216 of the *Landscape South Australia Act 2019,* you have a right of appeal to the Environment, Resources and Development Court against the imposition of any condition on the permit. The appeal must be instituted within six weeks of the date of permit issue. The appeal must also be served upon the Department within that time.

Enclosed is a copy of the General Specification for Well Construction which explains requirements for the well under 'The Act'.

For all other information please go to www.waterconnect.sa.gov.au or contact Water Licensing South East within the Department for Environment and Water on dew.lcwaterlicensing@sa.gov.au or (08) 8735 1134.

Yours sincerely

Dean Zeven
Team Leader – Limestone Coast
Delegate of Minister Department for Climate, Environment and Water

GOVERNMENT OF SOUTH AUSTRALIA

DEPARTMENT FOR ENVIRONMENT AND WATER

Mt Gambier Office | PO Box 1046 | Mt Gambier SA 5290 | [P] 8735 1134 [F] 8735 1135

PERMIT to undertake a WATER AFFECTING ACTIVITY

pursuant to section 112 of the Landscape South Australia Act 2019

WELL PERMIT

Subject to full compliance with all the procedures, specifications and limitations contained or referred to, in the conditions set out below,

Permit No:	449003
Expiry Date:	28/09/2024

Permission is hereby granted to: GHD PTY LTD
ACN 008 488 373
LEVEL 4
211 VICTORIA SQUARE
ADELAIDE SA 5000

To undertake the following water affecting activity:

Activity: Well Construction

Well Use: Investigation

CONDITIONS:

1. The activity authorised by this permit must only be undertaken on the land described below:

   CT 6005/338
   Allotment 206 in Deposited Plan 72468
   Hundred of Yatala

2. The equipment, materials and methods used in drilling, plugging, backfilling or sealing of a well, or the replacement or alteration of the casing, lining or screen of a well, shall not adversely affect the quality of an underground water resource.
3. Aquifers shall be protected during drilling, plugging, backfilling or sealing of a well, or the replacement or alteration of the casing, lining or screen of a well, to prevent adverse impacts upon the integrity of the aquifer.
4. This work may be subject to inspection by the Department's Drilling Inspectors.
5. If this well is incidental/ancillary to mining operations authorised under the Mining Act 1971, or a regulated activity under the Petroleum and Geothermal Energy Act 2000 (Acts), the well must be decommissioned (as outlined in the Minimum Construction Requirements for Water Bores in Australia Fourth Edition) prior to the relinquishment of the licence or lease under the associated Acts, unless alternative formal arrangements can be made with the owner or occupier of the land on which the well is located subject to approval by the relevant Minister or the Minister's agent.
6. Activities shall not have an unacceptable detrimental impact on cultural, heritage or social values.
7. The activity must not adversely affect water-dependent ecosystems nearby.
8. The well driller must submit a Well Completion Report to the Department within 30 days of completion of each activity authorised by this well construction permit.

PERMIT to undertake a WATER AFFECTING ACTIVITY

pursuant to section 112 of the Landscape South Australia Act 2019

WELL PERMIT

9. Well Construction must comply with the mandatory requirements of the Minimum Construction Requirements for Water Bores in Australia (4th Edition) and the General Specifications for Well Drilling Operations Affecting Water in South Australia (or any subsequent or related policy), as provided by the relevant authority.
10. The well subject to this permit must not be completed as an industrial water supply well unless prior approval has been obtained from the department.
11. All groundwater extracted during sampling and/or purging must be contained and disposed of in an appropriate manner to minimise risk to health and the environment.
12. Wells are to be backfilled when no longer required for ongoing monitoring and investigation purposes.
13. The authorised activity must be undertaken by a licensed driller.
14. If the well is considered unsatisfactory, it may be abandoned and a replacement well may then be constructed provided that the abandoned well is backfilled prior to the drill rig leaving the site.
15. Water samples are required from all wells drilled in respect of this permit.
16. Strata samples are not required.
17. The licensed well driller must forward with the report a plan obtained from the permit holder, who must mark thereon the location of all wells drilled in respect of this permit.
18. All wells must be drilled vertical unless written permission is obtained from the Minister.
19. Where a well passes or will pass through two or more aquifers, an impervious seal shall be made and maintained between the aquifers to prevent leakage between the aquifers.
20. The activity shall not significantly increase local drawdown.
21. The activity shall not adversely affect the quality, quantity and accessibility of water for supply from existing wells operated by other landholders.
22. Due to known soil/groundwater contamination in the sediments and aquifers above, caution should be taken in the drilling and/or cementing of this well.
23. The well is not to penetrate beyond a depth of 15 metres unless approved by the Regional Hydrogeologist.

NOTES:

1. Under section 216(1)(b)(ii) of the Act, you have a right of appeal to the Environment, Resources and Development Court against the imposition of any condition on this permit. The appeal must be instituted within six weeks of the date of permit issue. The appeal must also be served upon this department within that time.
2. This permit is not transferable.
3. This well construction permit is not an authorisation for a person to enter private property and prior authority must be obtained from the land owner in all circumstances.
4. The issue of this permit does not negate the requirement to comply with the provisions of other Acts that may impact on the activity undertaken pursuant to this permit.
5. This permit is not an approval to clear native vegetation.
6. This permit does not authorise the taking of water from the well for any purpose other than testing.

PERMIT to undertake a WATER AFFECTING ACTIVITY

pursuant to section 112 of the Landscape South Australia Act 2019

WELL PERMIT

7. If the extracted groundwater supply is required for human consumption, it is recommended that the water be quality tested.
8. It is recommended that all drilling equipment be decontaminated prior to construction of a new well or rehabilitation of an existing well to prevent the introduction or transfer of iron bacteria. Similar precautions should also be taken with pump installation equipment.

TAKE NOTE that the permit holder, or a person acting on behalf of the permit holder, who contravenes or fails to comply with a condition of this permit is guilty of an offence, and such acts or ommisions may result in the variation, suspension or revocation of the permit.

Date: 28/09/2023

Sonya Knight
Senior Water Licensing Officer
Delegate of Minister for Climate, Environment and Water

GOVERNMENT OF SOUTH AUSTRALIA

DEPARTMENT FOR ENVIRONMENT AND WATER

Mt Gambier Office | PO Box 1046 | Mt Gambier SA 5290 | [P] 8735 1134 [F] 8735 1135

PERMIT to undertake a WATER AFFECTING ACTIVITY

pursuant to section 112 of the Landscape South Australia Act 2019

WELL PERMIT

Subject to full compliance with all the procedures, specifications and limitations contained or referred to, in the conditions set out below,

Permit No:	449004
Expiry Date:	28/09/2024

Permission is hereby granted to: GHD PTY LTD
ACN 008 488 373
LEVEL 4
211 VICTORIA SQUARE
ADELAIDE SA 5000

To undertake the following water affecting activity:

Activity: Well Construction

Well Use: Investigation

CONDITIONS:

1. The activity authorised by this permit must only be undertaken on the land described below:

   CT 6005/338
   Allotment 206 in Deposited Plan 72468
   Hundred of Yatala

2. The equipment, materials and methods used in drilling, plugging, backfilling or sealing of a well, or the replacement or alteration of the casing, lining or screen of a well, shall not adversely affect the quality of an underground water resource.
3. Aquifers shall be protected during drilling, plugging, backfilling or sealing of a well, or the replacement or alteration of the casing, lining or screen of a well, to prevent adverse impacts upon the integrity of the aquifer.
4. This work may be subject to inspection by the Department's Drilling Inspectors.
5. If this well is incidental/ancillary to mining operations authorised under the Mining Act 1971, or a regulated activity under the Petroleum and Geothermal Energy Act 2000 (Acts), the well must be decommissioned (as outlined in the Minimum Construction Requirements for Water Bores in Australia Fourth Edition) prior to the relinquishment of the licence or lease under the associated Acts, unless alternative formal arrangements can be made with the owner or occupier of the land on which the well is located subject to approval by the relevant Minister or the Minister's agent.
6. Activities shall not have an unacceptable detrimental impact on cultural, heritage or social values.
7. The activity must not adversely affect water-dependent ecosystems nearby.
8. The well driller must submit a Well Completion Report to the Department within 30 days of completion of each activity authorised by this well construction permit.

PERMIT to undertake a WATER AFFECTING ACTIVITY

pursuant to section 112 of the Landscape South Australia Act 2019

WELL PERMIT

9. Well Construction must comply with the mandatory requirements of the Minimum Construction Requirements for Water Bores in Australia (4th Edition) and the General Specifications for Well Drilling Operations Affecting Water in South Australia (or any subsequent or related policy), as provided by the relevant authority.
10. The well subject to this permit must not be completed as an industrial water supply well unless prior approval has been obtained from the department.
11. All groundwater extracted during sampling and/or purging must be contained and disposed of in an appropriate manner to minimise risk to health and the environment.
12. Wells are to be backfilled when no longer required for ongoing monitoring and investigation purposes.
13. The authorised activity must be undertaken by a licensed driller.
14. If the well is considered unsatisfactory, it may be abandoned and a replacement well may then be constructed provided that the abandoned well is backfilled prior to the drill rig leaving the site.
15. Water samples are required from all wells drilled in respect of this permit.
16. Strata samples are not required.
17. The licensed well driller must forward with the report a plan obtained from the permit holder, who must mark thereon the location of all wells drilled in respect of this permit.
18. All wells must be drilled vertical unless written permission is obtained from the Minister.
19. Where a well passes or will pass through two or more aquifers, an impervious seal shall be made and maintained between the aquifers to prevent leakage between the aquifers.
20. The activity shall not significantly increase local drawdown.
21. The activity shall not adversely affect the quality, quantity and accessibility of water for supply from existing wells operated by other landholders.
22. The well is not to penetrate beyond a depth of 15 metres unless approved by the Regional Hydrogeologist.
23. Due to known soil/groundwater contamination in the sediments and aquifers above, caution should be taken in the drilling and/or cementing of this well.

NOTES:

1. Under section 216(1)(b)(ii) of the Act, you have a right of appeal to the Environment, Resources and Development Court against the imposition of any condition on this permit. The appeal must be instituted within six weeks of the date of permit issue. The appeal must also be served upon this department within that time.
2. This permit is not transferable.
3. This well construction permit is not an authorisation for a person to enter private property and prior authority must be obtained from the land owner in all circumstances.
4. The issue of this permit does not negate the requirement to comply with the provisions of other Acts that may impact on the activity undertaken pursuant to this permit.
5. This permit is not an approval to clear native vegetation.
6. This permit does not authorise the taking of water from the well for any purpose other than testing.

PERMIT to undertake a WATER AFFECTING ACTIVITY

pursuant to section 112 of the Landscape South Australia Act 2019

WELL PERMIT

7. If the extracted groundwater supply is required for human consumption, it is recommended that the water be quality tested.
8. It is recommended that all drilling equipment be decontaminated prior to construction of a new well or rehabilitation of an existing well to prevent the introduction or transfer of iron bacteria. Similar precautions should also be taken with pump installation equipment.

TAKE NOTE that the permit holder, or a person acting on behalf of the permit holder, who contravenes or fails to comply with a condition of this permit is guilty of an offence, and such acts or ommisions may result in the variation, suspension or revocation of the permit.

Date: 28/09/2023

Sonya Knight
Senior Water Licensing Officer
Delegate of Minister for Climate, Environment and Water

GOVERNMENT OF SOUTH AUSTRALIA

DEPARTMENT FOR ENVIRONMENT AND WATER

Mt Gambier Office | PO Box 1046 | Mt Gambier SA 5290 | [P] 8735 1134 [F] 8735 1135

PERMIT to undertake a WATER AFFECTING ACTIVITY

pursuant to section 112 of the Landscape South Australia Act 2019

WELL PERMIT

Subject to full compliance with all the procedures, specifications and limitations contained or referred to, in the conditions set out below,

Permit No:	449005
Expiry Date:	28/09/2024

Permission is hereby granted to: GHD PTY LTD
ACN 008 488 373
LEVEL 4
211 VICTORIA SQUARE
ADELAIDE SA 5000

To undertake the following water affecting activity:

Activity: Well Construction

Well Use: Investigation

CONDITIONS:

1. The activity authorised by this permit must only be undertaken on the land described below:

   CT 6005/338
   Allotment 206 in Deposited Plan 72468
   Hundred of Yatala

2. The equipment, materials and methods used in drilling, plugging, backfilling or sealing of a well, or the replacement or alteration of the casing, lining or screen of a well, shall not adversely affect the quality of an underground water resource.
3. Aquifers shall be protected during drilling, plugging, backfilling or sealing of a well, or the replacement or alteration of the casing, lining or screen of a well, to prevent adverse impacts upon the integrity of the aquifer.
4. This work may be subject to inspection by the Department's Drilling Inspectors.
5. If this well is incidental/ancillary to mining operations authorised under the Mining Act 1971, or a regulated activity under the Petroleum and Geothermal Energy Act 2000 (Acts), the well must be decommissioned (as outlined in the Minimum Construction Requirements for Water Bores in Australia Fourth Edition) prior to the relinquishment of the licence or lease under the associated Acts, unless alternative formal arrangements can be made with the owner or occupier of the land on which the well is located subject to approval by the relevant Minister or the Minister's agent.
6. Activities shall not have an unacceptable detrimental impact on cultural, heritage or social values.
7. The activity must not adversely affect water-dependent ecosystems nearby.
8. The well driller must submit a Well Completion Report to the Department within 30 days of completion of each activity authorised by this well construction permit.

PERMIT to undertake a WATER AFFECTING ACTIVITY

pursuant to section 112 of the Landscape South Australia Act 2019

WELL PERMIT

9. Well Construction must comply with the mandatory requirements of the Minimum Construction Requirements for Water Bores in Australia (4th Edition) and the General Specifications for Well Drilling Operations Affecting Water in South Australia (or any subsequent or related policy), as provided by the relevant authority.
10. The authorised activity must be undertaken by a licensed driller.
11. If the well is considered unsatisfactory, it may be abandoned and a replacement well may then be constructed provided that the abandoned well is backfilled prior to the drill rig leaving the site.
12. Water samples are required from all wells drilled in respect of this permit.
13. Strata samples are not required.
14. The licensed well driller must forward with the report a plan obtained from the permit holder, who must mark thereon the location of all wells drilled in respect of this permit.
15. All wells must be drilled vertical unless written permission is obtained from the Minister.
16. Where a well passes or will pass through two or more aquifers, an impervious seal shall be made and maintained between the aquifers to prevent leakage between the aquifers.
17. The activity shall not significantly increase local drawdown.
18. The activity shall not adversely affect the quality, quantity and accessibility of water for supply from existing wells operated by other landholders.
19. The well subject to this permit must not be completed as an industrial water supply well unless prior approval has been obtained from the department.
20. All groundwater extracted during sampling and/or purging must be contained and disposed of in an appropriate manner to minimise risk to health and the environment.
21. Wells are to be backfilled when no longer required for ongoing monitoring and investigation purposes.
22. The well is not to penetrate beyond a depth of 15 metres unless approved by the Regional Hydrogeologist.
23. Due to known soil/groundwater contamination in the sediments and aquifers above, caution should be taken in the drilling and/or cementing of this well.

NOTES:

1. Under section 216(1)(b)(ii) of the Act, you have a right of appeal to the Environment, Resources and Development Court against the imposition of any condition on this permit. The appeal must be instituted within six weeks of the date of permit issue. The appeal must also be served upon this department within that time.
2. This permit is not transferable.
3. This well construction permit is not an authorisation for a person to enter private property and prior authority must be obtained from the land owner in all circumstances.
4. The issue of this permit does not negate the requirement to comply with the provisions of other Acts that may impact on the activity undertaken pursuant to this permit.
5. This permit is not an approval to clear native vegetation.

PERMIT to undertake a WATER AFFECTING ACTIVITY

pursuant to section 112 of the Landscape South Australia Act 2019

WELL PERMIT

6. It is recommended that all drilling equipment be decontaminated prior to construction of a new well or rehabilitation of an existing well to prevent the introduction or transfer of iron bacteria. Similar precautions should also be taken with pump installation equipment.
7. This permit does not authorise the taking of water from the well for any purpose other than testing.
8. If the extracted groundwater supply is required for human consumption, it is recommended that the water be quality tested.

TAKE NOTE that the permit holder, or a person acting on behalf of the permit holder, who contravenes or fails to comply with a condition of this permit is guilty of an offence, and such acts or ommisions may result in the variation, suspension or revocation of the permit.

Date: 28/09/2023

Sonya Knight
Senior Water Licensing Officer
Delegate of Minister for Climate, Environment and Water

GOVERNMENT OF SOUTH AUSTRALIA

DEPARTMENT FOR ENVIRONMENT AND WATER

Mt Gambier Office | PO Box 1046 | Mt Gambier SA 5290 | [P] 8735 1134 [F] 8735 1135

PERMIT to undertake a WATER AFFECTING ACTIVITY

pursuant to section 112 of the Landscape South Australia Act 2019

WELL PERMIT

Subject to full compliance with all the procedures, specifications and limitations contained or referred to, in the conditions set out below,

Permit No:	449006
Expiry Date:	28/09/2024

Permission is hereby granted to: GHD PTY LTD
ACN 008 488 373
LEVEL 4
211 VICTORIA SQUARE
ADELAIDE SA 5000

To undertake the following water affecting activity:

Activity: Well Construction

Well Use: Investigation

CONDITIONS:

1. The activity authorised by this permit must only be undertaken on the land described below:

   CT 6005/338
   Allotment 206 in Deposited Plan 72468
   Hundred of Yatala

2. The equipment, materials and methods used in drilling, plugging, backfilling or sealing of a well, or the replacement or alteration of the casing, lining or screen of a well, shall not adversely affect the quality of an underground water resource.
3. Aquifers shall be protected during drilling, plugging, backfilling or sealing of a well, or the replacement or alteration of the casing, lining or screen of a well, to prevent adverse impacts upon the integrity of the aquifer.
4. This work may be subject to inspection by the Department's Drilling Inspectors.
5. If this well is incidental/ancillary to mining operations authorised under the Mining Act 1971, or a regulated activity under the Petroleum and Geothermal Energy Act 2000 (Acts), the well must be decommissioned (as outlined in the Minimum Construction Requirements for Water Bores in Australia Fourth Edition) prior to the relinquishment of the licence or lease under the associated Acts, unless alternative formal arrangements can be made with the owner or occupier of the land on which the well is located subject to approval by the relevant Minister or the Minister's agent.
6. Activities shall not have an unacceptable detrimental impact on cultural, heritage or social values.
7. The activity must not adversely affect water-dependent ecosystems nearby.
8. The well driller must submit a Well Completion Report to the Department within 30 days of completion of each activity authorised by this well construction permit.

PERMIT to undertake a WATER AFFECTING ACTIVITY

pursuant to section 112 of the Landscape South Australia Act 2019

WELL PERMIT

9. Well Construction must comply with the mandatory requirements of the Minimum Construction Requirements for Water Bores in Australia (4th Edition) and the General Specifications for Well Drilling Operations Affecting Water in South Australia (or any subsequent or related policy), as provided by the relevant authority.
10. The authorised activity must be undertaken by a licensed driller.
11. If the well is considered unsatisfactory, it may be abandoned and a replacement well may then be constructed provided that the abandoned well is backfilled prior to the drill rig leaving the site.
12. Water samples are required from all wells drilled in respect of this permit.
13. Strata samples are not required.
14. The licensed well driller must forward with the report a plan obtained from the permit holder, who must mark thereon the location of all wells drilled in respect of this permit.
15. All wells must be drilled vertical unless written permission is obtained from the Minister.
16. Where a well passes or will pass through two or more aquifers, an impervious seal shall be made and maintained between the aquifers to prevent leakage between the aquifers.
17. The activity shall not significantly increase local drawdown.
18. The activity shall not adversely affect the quality, quantity and accessibility of water for supply from existing wells operated by other landholders.
19. The well subject to this permit must not be completed as an industrial water supply well unless prior approval has been obtained from the department.
20. All groundwater extracted during sampling and/or purging must be contained and disposed of in an appropriate manner to minimise risk to health and the environment.
21. Wells are to be backfilled when no longer required for ongoing monitoring and investigation purposes.
22. Due to known soil/groundwater contamination in the sediments and aquifers above, caution should be taken in the drilling and/or cementing of this well.
23. The well is not to penetrate beyond a depth of 15 metres unless approved by the Regional Hydrogeologist.

NOTES:

1. Under section 216(1)(b)(ii) of the Act, you have a right of appeal to the Environment, Resources and Development Court against the imposition of any condition on this permit. The appeal must be instituted within six weeks of the date of permit issue. The appeal must also be served upon this department within that time.
2. This permit is not transferable.
3. This well construction permit is not an authorisation for a person to enter private property and prior authority must be obtained from the land owner in all circumstances.
4. The issue of this permit does not negate the requirement to comply with the provisions of other Acts that may impact on the activity undertaken pursuant to this permit.
5. This permit is not an approval to clear native vegetation.

PERMIT to undertake a WATER AFFECTING ACTIVITY

pursuant to section 112 of the Landscape South Australia Act 2019

WELL PERMIT

6. It is recommended that all drilling equipment be decontaminated prior to construction of a new well or rehabilitation of an existing well to prevent the introduction or transfer of iron bacteria. Similar precautions should also be taken with pump installation equipment.
7. This permit does not authorise the taking of water from the well for any purpose other than testing.
8. If the extracted groundwater supply is required for human consumption, it is recommended that the water be quality tested.

TAKE NOTE that the permit holder, or a person acting on behalf of the permit holder, who contravenes or fails to comply with a condition of this permit is guilty of an offence, and such acts or ommisions may result in the variation, suspension or revocation of the permit.

Date: 28/09/2023

Sonya Knight
Senior Water Licensing Officer
Delegate of Minister for Climate, Environment and Water

GOVERNMENT OF SOUTH AUSTRALIA

DEPARTMENT FOR ENVIRONMENT AND WATER

Mt Gambier Office | PO Box 1046 | Mt Gambier SA 5290 | [P] 8735 1134 [F] 8735 1135

PERMIT to undertake a WATER AFFECTING ACTIVITY

pursuant to section 112 of the Landscape South Australia Act 2019

WELL PERMIT

Subject to full compliance with all the procedures, specifications and limitations contained or referred to, in the conditions set out below,

Permit No:	449007
Expiry Date:	28/09/2024

Permission is hereby granted to: GHD PTY LTD
ACN 008 488 373
LEVEL 4
211 VICTORIA SQUARE
ADELAIDE SA 5000

To undertake the following water affecting activity:

Activity: Well Construction

Well Use: Investigation

CONDITIONS:

1. The activity authorised by this permit must only be undertaken on the land described below:

   CT 5104/576
   Allotment 201 in Filed Plan 28828
   Hundred of Yatala

2. The equipment, materials and methods used in drilling, plugging, backfilling or sealing of a well, or the replacement or alteration of the casing, lining or screen of a well, shall not adversely affect the quality of an underground water resource.
3. Aquifers shall be protected during drilling, plugging, backfilling or sealing of a well, or the replacement or alteration of the casing, lining or screen of a well, to prevent adverse impacts upon the integrity of the aquifer.
4. This work may be subject to inspection by the Department's Drilling Inspectors.
5. If this well is incidental/ancillary to mining operations authorised under the Mining Act 1971, or a regulated activity under the Petroleum and Geothermal Energy Act 2000 (Acts), the well must be decommissioned (as outlined in the Minimum Construction Requirements for Water Bores in Australia Fourth Edition) prior to the relinquishment of the licence or lease under the associated Acts, unless alternative formal arrangements can be made with the owner or occupier of the land on which the well is located subject to approval by the relevant Minister or the Minister's agent.
6. Activities shall not have an unacceptable detrimental impact on cultural, heritage or social values.
7. The activity must not adversely affect water-dependent ecosystems nearby.
8. The well driller must submit a Well Completion Report to the Department within 30 days of completion of each activity authorised by this well construction permit.

PERMIT to undertake a WATER AFFECTING ACTIVITY

pursuant to section 112 of the Landscape South Australia Act 2019

WELL PERMIT

9. Well Construction must comply with the mandatory requirements of the Minimum Construction Requirements for Water Bores in Australia (4th Edition) and the General Specifications for Well Drilling Operations Affecting Water in South Australia (or any subsequent or related policy), as provided by the relevant authority.
10. The authorised activity must be undertaken by a licensed driller.
11. If the well is considered unsatisfactory, it may be abandoned and a replacement well may then be constructed provided that the abandoned well is backfilled prior to the drill rig leaving the site.
12. Water samples are required from all wells drilled in respect of this permit.
13. Strata samples are not required.
14. The licensed well driller must forward with the report a plan obtained from the permit holder, who must mark thereon the location of all wells drilled in respect of this permit.
15. All wells must be drilled vertical unless written permission is obtained from the Minister.
16. Where a well passes or will pass through two or more aquifers, an impervious seal shall be made and maintained between the aquifers to prevent leakage between the aquifers.
17. The activity shall not significantly increase local drawdown.
18. The activity shall not adversely affect the quality, quantity and accessibility of water for supply from existing wells operated by other landholders.
19. The well subject to this permit must not be completed as an industrial water supply well unless prior approval has been obtained from the department.
20. All groundwater extracted during sampling and/or purging must be contained and disposed of in an appropriate manner to minimise risk to health and the environment.
21. Wells are to be backfilled when no longer required for ongoing monitoring and investigation purposes.
22. The well is not to penetrate beyond a depth of 15 metres unless approved by the Regional Hydrogeologist.
23. Due to known nearby soil/groundwater contamination in the sediments and aquifers above, caution should be taken in the drilling and/or cementing of this well(s).

NOTES:

1. Under section 216(1)(b)(ii) of the Act, you have a right of appeal to the Environment, Resources and Development Court against the imposition of any condition on this permit. The appeal must be instituted within six weeks of the date of permit issue. The appeal must also be served upon this department within that time.
2. This permit is not transferable.
3. This well construction permit is not an authorisation for a person to enter private property and prior authority must be obtained from the land owner in all circumstances.
4. The issue of this permit does not negate the requirement to comply with the provisions of other Acts that may impact on the activity undertaken pursuant to this permit.
5. This permit is not an approval to clear native vegetation.

PERMIT to undertake a WATER AFFECTING ACTIVITY

pursuant to section 112 of the Landscape South Australia Act 2019

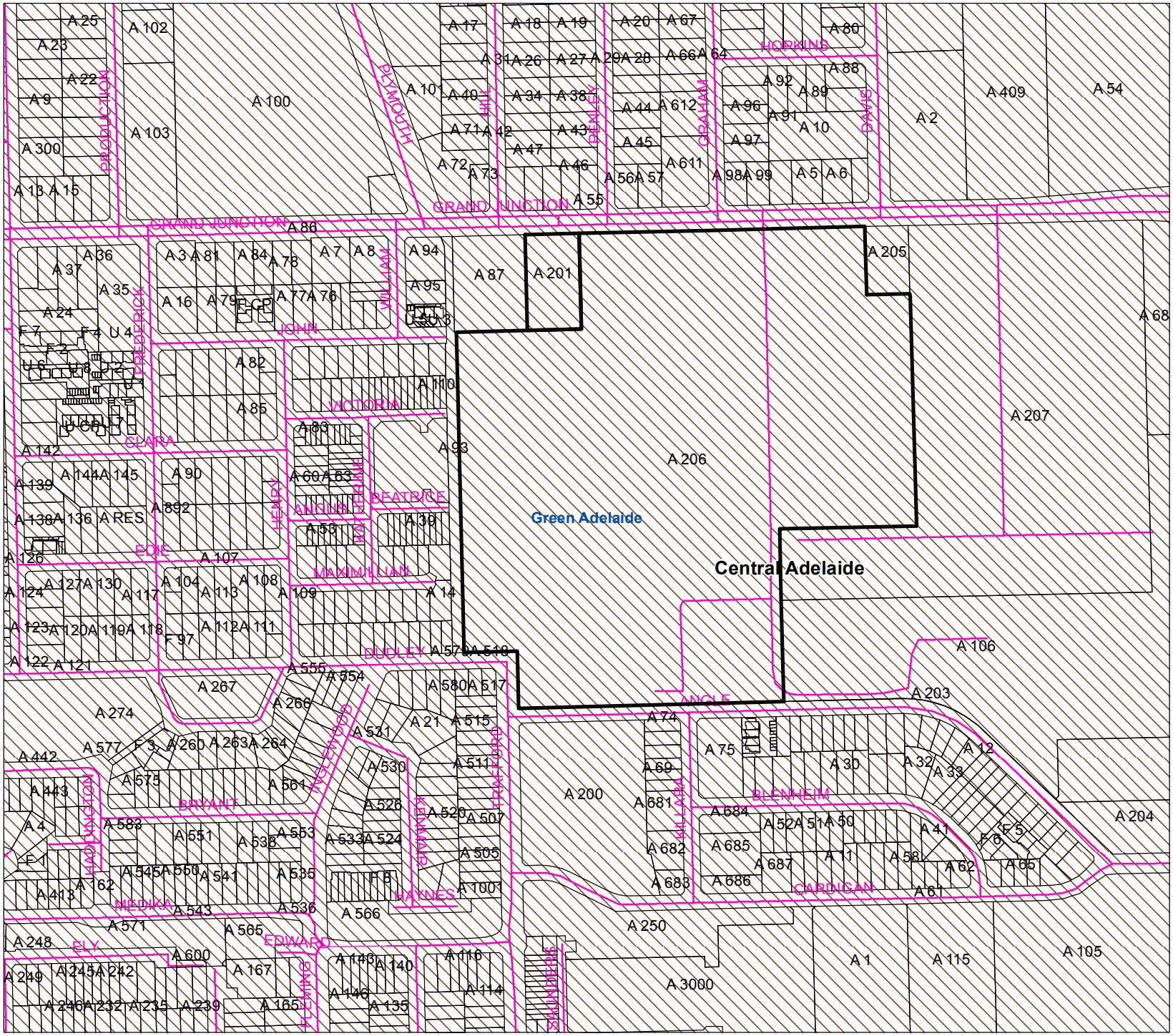
WELL PERMIT

6. It is recommended that all drilling equipment be decontaminated prior to construction of a new well or rehabilitation of an existing well to prevent the introduction or transfer of iron bacteria. Similar precautions should also be taken with pump installation equipment.
7. This permit does not authorise the taking of water from the well for any purpose other than testing.
8. If the extracted groundwater supply is required for human consumption, it is recommended that the water be quality tested.

TAKE NOTE that the permit holder, or a person acting on behalf of the permit holder, who contravenes or fails to comply with a condition of this permit is guilty of an offence, and such acts or ommisions may result in the variation, suspension or revocation of the permit.

Date: 28/09/2023

Sonya Knight
Senior Water Licensing Officer
Delegate of Minister for Climate, Environment and Water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Appendix G

Well Survey Results

LINKUP
CONSTRUCTION SURVEYS P

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Date: 7/11/2023

Monitoring well coordinates –
MFS Angle Park – 456 Grand Junction Rd, Angle Park

Well or Bore No.	Easting GDA20	Northing GDA20	R.L. Top of Casing A.H.D.	Natural Surface A.H.D.
MW01	276553.874	6140743.120	4.753	3.935
MW02	276665.854	6140595.988	5.725	4.925
MW03	276791.713	6140655.412	5.198	4.521
MW04	276897.097	6140647.134	4.787	4.894
MW05	276620.928	6140799.694	3.725	3.812

All Survey information was based from the GDA20 Z54 grid system and Australian Height Datum (AHD), Triangulated from Network Survey Marks.

Appendix H

Groundwater Purge Records

Groundwater Gauging Sheet

Client: MFS	**WL Meter Type:** Dip / Fox / (Int.Fce) / Gge
Project: MFS ANGLE PARK DSI	**Date:** 26/10/23
Job No.: 12616808	**Time:** 10:00
Location: MFS ANGLE PARK	**Sampler:** TW

Location / Bore ID	Stick up (m)	SWL (mbTOC)	Thickness of NAPL (mm)	Comment
MW01	0.8	3.772		WELL DEPTH: 5.885 mb TOC
				PURGE VOL: 42L
				VOL — COMMENTS
				10L — TAN-BROWN, VERY HIGH SEDIMENT LOAD, NO ODOUR, NO SHEEN
				20L — TAN-BROWN, VERY HIGH SEDIMENT LOAD, NO ODOUR, NO SHEEN
				30L — TAN-BROWN, HIGH SEDIMENT LOAD, NO ODOUR, NO SHEEN
				40L — TAN-BROWN, HIGH SEDIMENT LOAD, NO ODOUR, NO SHEEN
				50L — TAN-BROWN, MEDIUM SEDIMENT LOAD, NO ODOUR, NO SHEEN

Groundwater Gauging Sheet

Client: MFS	**WL Meter Type:** Dip / Fox / (Int.Fce) / Gge
Project: MFS ANGLE PARK DSI	**Date:** 26/10/23
Job No.: 12616808	**Time:** 10:40
Location: MFS ANGLE PARK	**Sampler:** TW

Location / Bore ID	Stick up (m)	SWL (mbTOC)	Thickness of NAPL (mm)	Comment
MW02	0.782	4.555		WELL DEPTH : 5.882 mb TOC
				PURGE VOL : 26L
				VOL / COMMENTS
				10L / TAN-BROWN, VERY HIGH SEDIMENT LOAD, NO ODOUR, NO SHEEN
				20L / TAN-BROWN, VERY HIGH SEDIMENT LOAD, NO ODOUR, NO SHEEN
				30L / TAN-BROWN, HIGH SEDIMENT LOAD, NO ODOUR, NO SHEEN
				40L / TAN-BROWN, HIGH SEDIMENT LOAD, NO ODOUR, NO SHEEN
				50L / TAN-BROWN, MEDIUM SEDIMENT LOAD, NO ODOUR, NO SHEEN

Groundwater Gauging Sheet

Client: MFS	**WL Meter Type:** Dip / Fox / (Int.Fce) / Gge
Project: MFS ANGLE PARK IDSI	**Date:** 26/10/2023
Job No.: 12616808	**Time:** 11:20
Location: MFS ANGLE PARK	**Sampler:** TW

Location / Bore ID	Stick up (m)	SWL (mbTOC)	Thickness of NAPL (mm)	Comment
MW03	0.675	4.004		WELL DEPTH: 4.902 mbTOC (Before Sediment removal) 5.955 mbTOC (After Sediment removal)
				PURGE VOL: 38 L
				↳ Sediment removed with bailer

VOL	COMMENTS
10 L	TAN-BROWN, VERY HIGH SEDIMENT LOAD, NO ODOUR, NO SHEEN
20 L	TAN-BROWN, VERY HIGH SEDIMENT LOAD, NO ODOUR, NO SHEEN
30 L	TAN-BROWN, HIGH SEDIMENT LOAD, NO ODOUR, NO SHEEN
40 L	TAN-BROWN, HIGH SEDIMENT LOAD, NO ODOUR, NO SHEEN
50 L	TAN-BROWN, MEDIUM SEDIMENT LOAD, NO ODOUR, NO SHEEN

Groundwater Gauging Sheet

Client: MFS	**WL Meter Type:** Dip / Fox / (Int.Fce) / Gge
Project: MFS ANGLE PARK DSI	**Date:** 26/10/2023
Job No.: 12616808	**Time:** 13:10
Location: MFS ANGLE PARK	**Sampler:** TW

Location / Bore ID	Stick up (m)	SWL (mbTOC)	Thickness of NAPL (mm)	Comment	
MW04	-	3.551		WELL DEPTH 4.985 mbTOC	
				PURGE VOL: 28L	
				VOL	COMMENTS
				10L	TAN-BROWN, VERY HIGH
					SEDIMENT LOAD, NO ODOUR,
					NO SHEEN
				20L	TAN-BROWN, VERY HIGH
					SEDIMENT LOAD, NO ODOUR,
					NO SHEEN
				30L	TAN-BROWN, HIGH SEDIMENT
					LOAD, NO ODOUR, NO SHEEN
				40L	TAN-BROWN, HIGH SEDIMENT
					LOAD, NO ODOUR, NO SHEEN
				50L	TAN-BROWN, MEDIUM
					SEDIMENT LOAD, NO ODOUR,
					NO SHEEN

Groundwater Gauging Sheet

Client: MFS	**WL Meter Type:** Dip / Fox / (Int.Fce) / Gge
Project: 12616808 - ANGLE PARK DSI	**Date:** 26/10/23
Job No.: 12616808	**Time:** 08:40
Location: MFS ANGLE PARK	**Sampler:** TW

Location / Bore ID	Stick up (m)	SWL (mbTOC)	Thickness of NAPL (mm)	Comment
MW05		2.759		WELL DEPTH: 4.965 mb TOC
				PURGE VOL: 43 L
				VOL / COMMENTS
				10 L / TAN-BROWN, VERY HIGH SEDIMENT LOAD, NO ODOUR, NO SHEEN
				20 L / TAN-BROWN, VERY HIGH SEDIMENT LOAD, NO ODOUR, NO SHEEN
				30 L / TAN-BROWN, HIGH SEDIMENT LOAD, NO ODOUR, NO SHEEN
				40 L / TAN-BROWN, HIGH SEDIMENT LOAD, NO ODOUR, NO SHEEN
				50 L / TAN-BROWN, HIGH SEDIMENT LOAD, NO ODOUR, NO SHEEN
				60 L / TAN-BROWN, MEDIUM SEDIMENT LOAD, NO ODOUR, NO SHEEN

Purging and Sampling Record

Bore ID: MW01

Job Information	Sampling Information	Bore Information
Client: MFS	Purge Method:	SWL(mbTOC): 3.771 m
Project: MFS ANGLE PARK DSI	Sample Method: LOW FLOW (PERI-PUMP)	Screen: From: to: m
Proj. No.: 12616808	WQ Meter Type: YSI	NAPL Check:
Sampler: TW	Flow Cell: (Y) / N Pump Depth: m	Ref.datum:
Date: 02/11/23	WLevel Meter Type: Dip / Fox / (Int.Fce) / Gge	Bore Depth: 5.885 m
Round	Field Filtered? Y / (N) (filter vessel, disposable filter/syringe)	Logic Check: Stick Up: m Bore Diam.: mm Well Cap Secure?

Time (.....)	Volume (L)		Temp (°C)	pH (pH units)	Elec.Cond (µS/cm)	Dis.Oxygen (mg/L)	Ox-Red Pt. (± mV)	~~SWL~~ (m TOC)	SWL (mTOC)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):			-	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*		
14:12									3.771	START
14:16	5	TOTAL	19.3	6.89	10393	1.14	152.1		3.765	TAN-BROWN, MEDIUM SEDIMENT LOAD, NO
14:20	4	9	19.3	6.86	11213	0.35	148.7		3.766	ODOUR, NO SHEEN
14:25	3	12	19.3	6.85	11484	0.33	145.4		3.768	PALE TAN-BROWN, LOW SEDIMENT LOAD, NO
14:30	4	16	19.3	6.85	11421	0.39	142.9		3.766	ODOUR, NO SHEEN
										SAMPLE@ 14:32

Field QA Checks:

Air bubbles in vials? Y / N Any violent reactions? Y / N
Decontamination as per GHD procedure? Y / N
Was sampling equipment pre-cleaned? Y / N
COC updated? Y / N

Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.				
Preservatives													

Comment: Duplicate samples collected, bottles used, access, condition of headworks etc

Purge Volumes

Casing Int. Dia (mm)	50	100	150
Vol (L/m of casing)	2.0	7.9	17.7

*Double for gravel pack

Purging and Sampling Record

Bore ID: MW02

Job Information	Sampling Information	Bore Information
Client: MFS	Purge Method:	SWL(mbTOC): 4.556 m
Project: MFS ANGLE PARK DSI	Sample Method: LOW FLOW (PERI-PUMP)	Screen: From: to: m
Proj. No.: 12616808	WQ Meter Type: YSI	NAPL Check:
Sampler: TW	Flow Cell: (Y) / N Pump Depth: m	Ref.datum:
Date: 02/11/23	WLevel Meter Type: Dip / Fox / (Int.Fce) / Gge	Bore Depth: 5.881 m
Round	Field Filtered? Y (N) (filter vessel, disposable filter/syringe)	Logic Check: Stick Up: m Bore Diam.: mm Well Cap Secure?

Time (.....)	Volume (L)		Temp (°C)	pH (pH units)	Elec.Cond (µS/cm)	Dis.Oxygen (mg/L)	Ox-Red Pt. (± mV)	SWL (m TOC)	(.....)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):		-	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*			
10:25								4.556		START
10:30	2	TOTAL	19.9	6.76	31169	4.69	152.5	4.550		PALE TAN-BROWN, MEDIUM TURBIDITY/SEDIMENT
10:35	2	4	19.9	6.75	30769	4.21	150.9	4.552		LOAD, NO ODOUR, NO SHEEN.
10:41	2	6	19.9	6.74	27933	3.58	149.6	4.551		PALE TAN-BROWN, LOW SEDIMENT LOAD, NO
10:46	2	8	19.9	6.74	30767	3.29	149.3	4.550		ODOUR, NO SHEEN.
10:51	2	10	19.9	6.74	30868	3.21	149.0	4.552		
10:56	2	12	19.9	6.73	30922	3.19	148.8	4.553		
										SAMPLE @ 10:57

Field QA Checks:

Air bubbles in vials? Y / N Any violent reactions? Y / N
Decontamination as per GHD procedure? Y / N
Was sampling equipment pre-cleaned? Y / N
COC updated? Y / N

Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.				
Preservatives													

Comment: Duplicate samples collected, bottles used, access, condition of headworks etc

Purge Volumes

Casing Int. Dia (mm)	50	100	150
Vol (L/m of casing)	2.0	7.9	17.7

*Double for gravel pack

Purging and Sampling Record

Bore ID: MW03

Job Information
- Client: MFS
- Project: MFS ANGLE PARK DSI
- Proj. No.: 12616808
- Sampler: TW
- Date: 02/11/23
- Round

Sampling Information
- Purge Method:
- Sample Method: LOW FLOW (PERI-PUMP)
- WQ Meter Type: YSI
- Flow Cell: (Y) N Pump Depth: m
- WLevel Meter Type: Dip / Fox / (Int.Fce) / Gge
- Field Filtered? Y / (N) (filter vessel, disposable filter/syringe)

Bore Information
- SWL(mbTOC): 4.002 m Logic Check:
- Screen: From: to: m Stick Up: m
- NAPL Check: Bore Diam.: mm
- Ref.datum: Well Cap Secure?
- Bore Depth: 5.952 m

Time (.....)	Volume (L)	TOTAL	Temp (°C)	pH (pH units)	Elec.Cond (µS/cm)	Dis.Oxygen (mg/L)	Ox-Red Pt. (± mV)	SWL (m TOC)	(.....)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings)			-	+/- 0.05 pH	+/- 3%	+/- 10%	+/- 10 mV	stable		
11:25								4.002		START
11:30	5	5	19.5	6.80	18793	4.13	148.3	3.998		TAN-BROWN, MEDIUM TO HIGH SEDIMENT
11:33	4	9	19.5	6.79	19052	3.59	146.4	3.999		LOAD, NO ODOUR, NO SHEEN
11:37	3	12	19.5	6.78	19296	3.24	145.0	3.998		TAN-BROWN, MEDIUM SEDIMENT LOAD,
11:41	3	15	19.5	6.78	19203	3.15	141.0	4.000		NO ODOUR, NO SHEEN
11:45	3	18	19.5	6.78	19213	3.21	145.1	3.998		TAN-BROWN, LOW TO MEDIUM SEDIMENT
										LOAD, NO ODOUR, NO SHEEN
										SAMPLE @ 11:46

Field QA Checks:
Air bubbles in vials? Y / N Any violent reactions? Y / N
Decontamination as per GHD procedure? Y / N
Was sampling equipment pre-cleaned? Y / N
COC updated? Y / N

Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.				
Preservatives													

Comment: Duplicate samples collected, bottles used, access, condition of headworks etc

Purge Volumes

Casing Int. Dia (mm)	50	100	150
Vol (L/m of casing)	2.0	7.9	17.7

*Double for gravel pack

Purging and Sampling Record

Bore ID: MW04

Job Information	Sampling Information	Bore Information
Client: MFS	Purge Method:	SWL(mbTOC): 3.550 m
Project: MFS ANGLE PARK DSI	Sample Method: LOW FLOW (PERI-PUMP)	Screen: From: to: m
Proj. No.: 12616808	WQ Meter Type: YSI	NAPL Check:
Sampler: TW	Flow Cell: (Y) N	Pump Depth: m
Date: 02/11/23	WLevel Meter Type: Dip / Fox / (Int.Fce) / Gge	Ref.datum:
Round	Field Filtered? Y / (N) (filter vessel, disposable filter/syringe)	Bore Depth: 4.983 m
		Logic Check:
		Stick Up: m
		Bore Diam.: mm
		Well Cap Secure?

Time (.....)	Volume (L)		Temp (°C)	pH (pH units)	Elec.Cond (µS/cm)	Dis.Oxygen (mg/L)	Ox-Red Pt. (± mV)	SWL (m TOC)	(.....)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):			-	+/- 0.05 pH	+/- 3%	+/- 10%	+/- 10 mV	stable		
12:08								3.550		START
12:12	5	TOTAL	20.8	6.97	4528	4.24	136.7	3.445		TAN-BROWN, HIGH SEDIMENT LOAD, NO ODOUR,
12:16	4	9	20.9	6.98	4580	4.18	135.4	3.448		NO SHEEN
12:20	4	13	20.8	6.97	4597	4.08	133.8	3.447		TAN-BROWN, LOW TO MEDIUM SEDIMENT LOAD,
12:25	4	17	20.8	6.97	4565	4.05	132.6	3.448		NO ODOUR, NO SHEEN
										SAMPLE @ 12:26

Field QA Checks:

Air bubbles in vials? Y / N Any violent reactions? Y / N
Decontamination as per GHD procedure? Y / N
Was sampling equipment pre-cleaned? Y / N
COC updated? Y / N

Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.				
Preservatives													

Comment: Duplicate samples collected, bottles used, access, condition of headworks etc

Purge Volumes

Casing Int. Dia (mm)	50	100	150
Vol (L/m of casing)	2.0	7.9	17.7

*Double for gravel pack

Purging and Sampling Record

Bore ID: MW05

Job Information	Sampling Information	Bore Information
Client: MFS	Purge Method:	SWL(mbTOC): 2.757 m
Project: MFS ANGLE PARK DSI	Sample Method: LOW FLOW (PERI-PUMP)	Screen: From: to: m
Proj. No.: 12616808	WQ Meter Type: YSI	NAPL Check:
Sampler: TW	Flow Cell: (Y) N Pump Depth: m	Ref.datum:
Date: 02/11/23	WLevel Meter Type: Dip / Fox / (Int.Fce) / Gge	Bore Depth: 4.966 m
Round	Field Filtered? Y / (N) (filter vessel, disposable filter/syringe)	Logic Check: Stick Up: m Bore Diam.: mm Well Cap Secure?

Time (.....)	Volume (L)		Temp (°C)	pH (pH units)	Elec.Cond (µS/cm)	Dis.Oxygen (mg/L...)	Ox-Red Pt. (± mV)	SWL (m TOC)	(.....)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):			-	+/- 0.05 pH	+/- 3%	+/- 10%	+/- 10 mV	stable		
09:18								2.757		START
09:20	1	TOTAL	20.7	6.91	10445	1.9	159.9	2.753		TAN-BROWN, MEDIUM TO HIGH SEDIMENT
09:24	4	5	20.7	6.89	10530	2.4	143.3	2.751		LOAD, NO ODOUR, NO SHEEN
09:28	3	8	20.7	6.89	10568	1.6	138.9	2.752		TAN-BROWN, LOW TO MEDIUM SEDIMENT
09:33	2	10	20.7	6.89	10512	1.31	136.2	2.754		LOAD, NO ODOUR, NO SHEEN
09:37	2	12	20.7	6.89	10592	1.25	134.2	2.755		PALE TAN-BROWN, LOW SEDIMENT LOAD,
09:40	1.5	13.5	20.7	6.88	10544	1.21	133.6	2.756		NO ODOUR, NO SHEEN
										SAMPLE@ 09:41

Field QA Checks:

Air bubbles in vials? Y / N Any violent reactions? Y / N
Decontamination as per GHD procedure? Y / N
Was sampling equipment pre-cleaned? Y / N
COC updated? Y / N

Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.				
Preservatives													

Comment: Duplicate samples collected, bottles used, access, condition of headworks etc

Purge Volumes

Casing Int. Dia (mm)	50	100	150
Vol (L/m of casing)	2.0	7.9	17.7

*Double for gravel pack

Appendix I

QAQC Report

Quality Assurance and Quality Control Report

1. Laboratories and data set

The soil samples collected during the investigation were submitted to ALS as the primary laboratory and Eurofins as the secondary laboratory. These laboratories are NATA accredited to perform the required analysis, with the exception of metals in vegetation samples, which are only accredited by the internal laboratory testing accreditation.

The selected laboratories conducted the requested analyses in accordance with the guidelines outlined in ASC NEPM.

The primary results and QA/QC results were reported in the laboratory Certificates of Analysis provided in Appendix E.

2. Data quality indicators

Table 1 provides a review of the DQIs adopted during the sampling investigation.

Table 1 DQI review

DQI	Objective	Outcome	References
GHD Internal Procedures			
Comparison of field and analytical data	Agreement between visual and olfactory evidence with laboratory results	Achieved	This was reflected in analytical results. ALS/Eurofins Certificates of Analysis (Appendix E) and Field Records (Appendix F)
Chain of Custody documentation	Supply Chain of Custody Documentation with all samples	Achieved	Copies of Chain of Custody Documentation (Appendix E)
Sample analysis and extraction holding times	Comply with holding times	Achieved	ALS/Eurofins Laboratory Quality Control Reports (Appendix E)
Analysis of inter and intra-laboratory duplicate samples	Analysis of duplicate samples in 10% of primary samples	Achieved	AS4482.1-2005 and US EPA NEPM 1999 (as amended 2013) and ALS/Eurofins certificates of analysis (Appendix E)
External Laboratory Procedures			
Analysis of laboratory method blanks	No contamination of blanks	Achieved	ALS/Eurofins Laboratory Quality Control Reports (Appendix E)
Analysis of laboratory spike recoveries	Recoveries within the laboratory specified recovery limits	Achieved	ALS/Eurofins Laboratory Quality Control Reports (Appendix E)
Analysis of laboratory internal duplicates	Frequencies and RPDs within guideline and internal laboratory	Achieved	NEPM 1999 (as amended 2013). ALS/Eurofins Laboratory Quality Control Reports (Appendix E)

DQI	Objective	Outcome	References
	limits (RPD of 0-30%)		

3. QA/QC assessment method

Established QA/QC procedures to assess data quality were maintained throughout the project. The QA/QC program undertaken as part of the assessment by GHD included the following:

– Use of appropriately qualified and trained staff.
– Use of PFAS-free sampling equipment and laboratory sample containers.
– Preservation of samples with ice during transport from the field to the laboratory.
– Transportation of samples with accompanying chain-of-custody documentation.
– Compliance with sample holding times.
– Review of results of a blind duplicate samples.
– Review of results of a split duplicate samples.
– Review of results of a field blank samples.
– Review of internal analysis of laboratory duplicates, spikes and blanks.

The QC program employed during this investigation was in accordance with the general requirements set out in the Australian Standard AS4482.1 (2005) and the NEMP 2.0 (2020). QC samples provide information that discounts or potentially identifies errors due to possible sources of cross contamination, inconsistencies in sampling and analytical techniques used. The QC program completed included the collection and analysis of duplicate samples, rinsate samples and trip blank samples as described below:

– **Blind duplicate samples:** These are coded duplicate samples submitted to the primary laboratory for analysis as individual samples without any indication to the laboratory that they have been duplicated.
– **Split duplicate samples:** These are duplicate samples split in the field, with one sample being sent to a secondary laboratory for analysis. The same parameters are analysed utilising similar analytical techniques.
– **Rinsate samples:** A rinsate sample is collected from a re-usable piece of equipment to detect potential cross-contamination between sampling locations.
– **Trip Blanks:** A laboratory supplied uncontaminated (blank) deionised water sample which is placed within the ice chest with the samples. This sample is analysed at the laboratory to indicate if contamination occurred during transportation of samples.

A quantitative measure of the accuracy of the check analyses results obtained was made using calculated relative percentage difference (RPD) values. The RPD values were calculated using the following equation.

$$RPD(\%) = \frac{\langle Co - Cs \rangle}{\left\langle \frac{Co + Cs}{2} \right\rangle} \times 100$$

Where Co = concentration obtained from the original sample

Cs = concentration obtained from the duplicate sample

4. GHD field quality control

4.1 Duplicate samples

All RPD values were within the acceptable ranges with exceptions summarised in Table 2. All RPD results can be found in full in Table 3 at the end of this report.

Table 2 Blind duplicate and split duplicate RPD exceedance summary

Primary Sample	QAQC Samples	Analyte	Primary result (mg/kg)	Duplicate Result (mg/kg)	Split Result (mg/kg)	Highest RPD (%)
BH01	FD02 FS02	PFHxS	0.0003	0.0005	<0.005	50
		PFOS	0.0499	0.0144	0.027	110
		PFPeA	0.0002	0.0005	<0.005	86
		PFHxA	0.0002	0.0004	<0.005	67
		PFNA	0.0005	0.0003	<0.005	50
		PFDA	0.0002	0.0016	<0.005	156
		Sum of PFHxS and PFOS	0.502	0.0149	0.027	108
		PFAS (Sum of total)	0.513	0.0195	<0.05	90
		PFAS (Sum of Total) (WA DER List)	0.0506	0.0158	0.027	105
BH03	FD03 FS03	PFOS	0.0073	0.0127	0.01	54
		Sum of PFHxS and PFOS	0.0073	0.0183	0.01	86
		PFAS (Sum of total)	0.0073	0.0207	<0.05	96
		PFAS (Sum of Total) (WA DER List)	0.0073	0.0198	0.01	92
BH04_ PAVER	FD01 FS01	PFBS	0.0006	0.0009	<0.005	40
		PFPeS	0.0005	0.0012	<0.005	82
		PFHpS	0.0003	0.0006	<0.005	67
		PFHxS	0.0048	0.0070	0.0078	48
		PFOS	0.0069	0.0168	0.032	129
		PFPeA	0.0005	0.0009	<0.005	57
		PFHpA	0.0002	0.0004	<0.005	67
		6:2 Fluorotelomer Sulfonate (6:2 FTS)	0.0036	0.0069	0.019	136
		Sum of PFHxS and PFOS	0.0117	0.0238	0.0398	109
		PFAS (Sum of Total)	0.0199	0.0407	0.0588	99
		PFAS (Sum of Total) (WA DER List)	0.0191	0.0389	0.0588	102
MW04	FD05 FS05	PFOS	0.0029	0.0018	<0.005	47
		PFHxA	0.0005	0.0007	<0.005	33
TP04	QC1 QC1A	PFOS	0.103	0.135	0.26	87
		PFDS	0.0002	0.0003	<0.005	40
		PFOA	0.0005	0.0007	<0.005	33

		Sum of PFHxS and PFOS	0.105	0.137	0.26	83
		PFAS (Sum of Total)	0.108	0.141	0.26	83
		PFAS (Sum of Total) (WA DER List)	0.106	0.139	0.26	84
TP16	QC4 QC4A	PFHxS	0.0009	0.0005	<0.005	57
		PFOS	0.0012	0.0006	<0.005	67
		Sum of PFHxS and PFOS	0.0021	0.0011	<0.005	62
		PFAS (Sum of Total)	0.0023	0.0011	<0.05	71
		PFAS (Sum of Total) (WA DER List)	0.0023	0.0011	<0.01	71
MW05	FD01 FS01	PFBA	0.5	0.6	1.3	89
		PFNA	0.03	0.02	0.02	40
		8:2 Fluorotelomer sulfonic acid (8:2 FTS)	0.26	0.28	0.19	31

A number of exceeding RPD results were reported, this likely being attributed to the heterogenous nature of the soil encountered and low concentrations detected. Sample concentrations were also below the laboratory limit of reporting for several analytes, with results unable to be calculated, indicating good analytical data correlation between the sample and duplicate pairs. In summary, it is concluded the RPD exceedances outside the acceptable ranges do not affect the data usability.

Blind duplicate and split duplicate sample frequency

A summary of the blind and split duplicate sample frequency is presented in Table 3.

Table 3 Blind duplicate and split duplicate sample frequency

Primary Samples Count	Blind Duplicate Samples Count	Percentage of Primary Samples	Required QC sample frequency of 10% met?	Split Samples Count	Percentage of Primary Samples	Required QC sample frequency of 10% met?
101	10	10%	Yes	9	90%	No

The blind duplicate sample rates for the soil, sediment and groundwater investigations satisfies the data quality objective for this investigation as they are in general accordance with Australian Standard AS4482.1-2005 and the NEMP 2.0 (2020).

Although 10 split samples were collected only nine were analysed due to an error in transfer between laboratories. Although this puts the percentage below what is required given the high number of quality control samples this will not likely affect the reliability of the data.

4.2 Rinsate Blanks

All analytes were reported below the laboratory LOR for rinsate samples analysed demonstrating that cross contamination between samples and sampling equipment did not occur and decontamination procedures were acceptable. Rinsate blank results are presented at the end of this report.

5. Laboratory QA/QC

Results of the internal laboratory quality control programs are included in the laboratory reports provided in Appendix F.

5.1 Internal duplicates

RPDs for laboratory internal duplicates were within the laboratory nominated accepted ranges.

5.2 Matrix spikes

Matrix spikes were within the laboratory acceptable ranges, with the exception of those presented in Table 4.

Table 4 Matrix spike outliers

Analyte	Laboratory Report	Laboratory Comments
Perfluorobutanoic acid (PFBA)	EM2319782	Recovery less than lower data quality objective
Perfluorohexane sulfonic acid (PFHxS)	EM2319031	MS recovery not determined, background level greater than or equal to 4x spike level.

5.3 Laboratory control spikes

Laboratory control spikes were within the laboratory nominated acceptable ranges.

5.4 Method blanks

All reported concentrations for laboratory method blanks analysed by both laboratories were less than their respective laboratory reporting limits.

5.5 Holding times

All samples were analysed for all analytes within the required holding times in accordance with the ASC NEPM.

5.6 Laboratory QA/QC summary

Given the relatively low number of laboratory QA/QC result outliers and the presence of matrix interference in the matrix spike outliers, GHD considers the data to be of satisfactory precision on which to base the assessment.

6. Conclusion

Conclusions regarding the environmental status of the site and interpretation of data obtained during this assessment, are considered robust and defensible based on the QA/QC program undertaken during the sampling program.

Appendix J

Field Sheets

Daily Record Sheet

001

Client: MFS		Job No: 12616808	
Job Name: MFS ANGLE PARK DSI		Date: 23/10/2023	
GHD Representative:	TERRENCE WILSON	Arrival Time: 08:00	Departure Time: 15:10
Weather Conditions:	(Please circle) (Fine) Overcast Light Rain Heavy Rain Other_____		
Works Being Undertaken:	SOIL BORING AND SAMPLING		

Personnel/Contractor(s) Present (List all); Inducted into GHD H&SP?	Inducted	Arrival Time	Departure Time
JOSH ANDERSON, ANGUS ROBINSON	YES	08:00	15:10
STEVE GRIMLEY	YES	08:00	12:20
DAVID WATT, WB DRILLING	YES	08:00	15:00
IAN WATT, WB DRILLING	YES	08:00	15:00

Photographs Taken: (Please circle) Yes No If Yes, list below or attach photo register.

Location	Time	Record of Activities / Issues Encountered / Discussions with Client/Contractors / Sketch / Notes
MFS ANGLE PARK	08:00	ARRIVE ON SITE, SIGN IN AT CONTROL ROOM AND WALKTHROUGH TO VIEW BOREHOLE LOCATIONS
	08:30	COMMENCE WITH SOIL BORES AND SAMPLE COLLECTION:
		BH01 : BH01_0.01-0.1; BH01_0.2-0.3 (FD02, FS02); BH01_0.6-0.7; BH01_0.7-0.8; BH01_1.3-1.4; BH01_1.9-2.0; BH01_2.5-2.6; BH01_3.5-3.6; BH01_4.4-4.5
		BH02 : BH02_PAVER; BH02_0.08-0.2; BH02_0.9-1.0; BH02_1.6-1.7; BH02_2.6-2.7; BH02_3.1-3.2; BH02_3.9-4.0.
		BH03 : BH03_0.01-0.3 (FD03, FS03); BH03_0.4-0.5; BH03_0.6-0.7; BH03_1.2-1.3; BH03_1.3-1.4; BH03_2.0-2.1; BH03_2.3-2.4; BH03_3.3-3.4; BH03_3.9-4.0
		BH04 : BH04_PAVER (FD01, FS01); BH04_0.08-0.3; BH04_0.6-0.7; BH04_0.9-1.0; BH04_1.4-1.5; BH04_2.2-2.3; BH04_3.1-3.2; BH04_3.4-3.5
		BH05 : BH05_0.0-0.02; BH05_0.05-0.15; BH05_0.3-0.4; BH05_0.5-0.6; BH05_1.9-2.0; BH05_2.9-3.0; BH05_3.9-4.0; BH05_4.4-4.5
		BH06 : BH06_0.0-0.1; BH06_0.15-0.25; BH06_0.4-0.5; BH06_0.9-1.0; BH06_1.4-1.5; BH06_2.1-2.2; BH06_3.1-3.2; BH06_3.9-4.0
		BH07 : BH07_PAVER; BH07_0.08-0.18; BH07_0.35-0.45; BH07_0.9-1.0; BH07_1.4-1.5; BH07_2.4-2.5; BH07_3.4-3.5; BH07_3.9-4.0

Is a Notice of Proposed Variation, Variation Order or Site Instruction Required? (Please circle) Yes (No)

Provide Details: –

Further Inspection and/or Testing Required on above Work:	–

Are there any H&S requirements to be considered for future works? NO

Has the site been reinstated suitably (left clean and tidy)? YES

BH08: BH08_PAVER; BH08_0.08-0.15; BH08_0.2-0.3; BH08_0.4-0.5; BH08_0.5-0.6; BH08_0.9-1.0; BH08_1.9-2.0; BH08_2.9-3.0; BH08_3.9-4.0; BH08_4.4-4.5.

FB01 - FIELD BLANK
RB01 - RINSATE BLANK (COLLECTED OFF PVC CORE LINER)

15:10 SIGN OUT AND LEAVE SITE

Daily Record Sheet

001

Client: MFS		Job No: 12616808	
Job Name: MFS ANGLE PARK DSI		Date: 24/10/2023	
GHD Representative:	TERRENCE WILSON	Arrival Time: 08:00	Departure Time: 15:00
Weather Conditions:	(Please circle) Fine (Overcast) Light Rain Heavy Rain Other_____		
Works Being Undertaken:	GROUNDWATER MONITORING WELL INSTALLATION		

Personnel/Contractor(s) Present (List all); Inducted into GHD H&SP?	Inducted	Arrival Time	Departure Time
ANGUS ROBINSON	YES	08:00	15:00
JOSHUA ANDERSON	YES	08:00	15:00
DAVID WATT, WB DRILLING	YES	08:00	15:00
IAN WATT, WB DRILLING	YES	08:00	15:00

Photographs Taken: (Please circle) Yes No If Yes, list below or attach photo register.

Location	Time	Record of Activities / Issues Encountered / Discussions with Client/Contractors / Sketch / Notes
MFS ANGLE PARK	08:00	ARRIVE ON SITE AND SIGN IN AT CONTROL ROOM
	08:30	COMMENCE WITH WELL INSTALLATIONS AND SOIL SAMPLING:
		MW01: MW01_0.01-0.1; MW01_0.1-0.2; MW01_0.4-0.5; MW01_0.85-0.95; MW01_1.8-1.9; MW01_2.8-2.9; MW01_3.8-3.9; MW01_4.9-5.0
		MW02: MW02_0-0.1; MW02_0.3-0.4 (FD04, FS04); MW02_0.5-0.6; MW02_0.9-1.0; MW02_1.7-1.8; MW02_2.4-2.5; MW02_3.4-3.5; MW02_3.9-4.0; MW02_4.9-5.0
		MW03: MW03_0-0.1; MW03_0.3-0.4; MW03_0.75-0.85; MW03_1.4-1.5; MW03_1.8-1.9; MW03_2.8-2.9; MW03_3.8-3.9; MW03_4.8-5.0
		MW04: MW04_0-0.07; MW04_0.2-0.3 (FD05, FS05); MW04_0.75-0.85; MW04_1.4-1.5; MW04_1.8-1.9; MW04_2.1-2.2; MW04_3.1-3.2; MW04_4.1-4.2; MW04_4.9-5.0
		FB02 - FIELD BLANK
		RB02A - RINSATE BLANK (COLLECTED OFF PVC LINER)

WELL DETAILS	MW01 (MONUMENT)	MW02 (MONUMENT)	MW03 (MONUMENT)	MW04 (GATIC)
SCREEN	2.0-5.0mbgl	2.0-5.0mbgl	2.0-5.0mbgl	2.0-5.0mbgl
GRAVEL PACK	1.5-5.0mbgl	1.5-5.0mbgl	1.5-5.0mbgl	1.5-5.0mbgl
BENTONITE	1.0-1.5m bgl	1.0-1.5mbgl	1.0-1.5mbgl	1.0-1.5mbgl
GROUT	0.0-1.0m bgl	0.0-1.0mbgl	0.0-1.0mbgl	0.0-1.0mbgl
PERMIT N°	449003	449004	449005	449006

15:00 SIGN OUT AND LEAVE SITE

Is a Notice of Proposed Variation, Variation Order or Site Instruction Required? (Please circle) Yes (No)

Provide Details: –

Further Inspection and/or Testing Required on above Work:	–

Are there any H&S requirements to be considered for future works? NO

Has the site been reinstated suitably (left clean and tidy)? YES

Daily Record Sheet

001

Client: MFS		Job No: 12616808	
Job Name: MFS ANGLE PARK DSI		Date: 25/10/2023	
GHD Representative:	TERRENCE WILSON	Arrival Time: 07 45	Departure Time: 14: 00
Weather Conditions:	(Please circle) Fine Overcast Light Rain Heavy Rain Other PARTLY CLOUDY		
Works Being Undertaken:	MONITORING WELL INSTALLATION AND SOIL SAMPLING		

Personnel/Contractor(s) Present (List all); Inducted into GHD H&SP?	Inducted	Arrival Time	Departure Time
ANGUS ROBINSON	YES	07:45	14:00
DAVID WATT, WB DRILLING	YES	07:45	11:00
IAN WATT, WB DRILLING	YES	07:45	11:00
DARREN SILVA, AJ CIVILS	YES	08:00	12:30

Photographs Taken: (Please circle) Yes No If Yes, list below or attach photo register.

Location	Time	Record of Activities / Issues Encountered / Discussions with Client/Contractors / Sketch / Notes
MFS ANGLE PARK	07:45	ARRIVE ON SITE AND SIGN IN AT CONTROL ROOM
	08:10	COMMENCE WITH MONITORING WELL INSTALLATION
		AND SOIL SAMPLE COLLECTION:
		MW05: MW05_PAVER; MW05_0.08-0.12; MW05_0.7-0.8;
		MW05_0.85-0.95; MW05_1.4-1.5; MW05_2.4-2.5;
		MW05_3.4-3.5; MW05_3.9-4.0; MW05_4.9-5.0
		SD03: COLLECTED FROM STORM WATER CHANNEL
		NW OF FIRE STATION AT OUTLET OF PIPE
		SS01: REPLACES TP 19 ON ORIGINAL PLAN (SAPN TRAINING AREA)
		SS02: REPLACES TP 20 ON ORIGINAL PLAN (SAPN TRAINING AREA)
		FR03: FIELD BLANK
		RB03A: RINSATE BLANK (COLLECTED OFF NITRILE GLOVE)
	14:00	SIGN OUT AND LEAVE SITE
		WELL DETAILS | MW05 (GATIC)
		SCREEN | 2.0-5.0 mbgl
		GRAVEL PACK | 1.5-5.0 mbgl
		BENTONITE | 1.0-1.5 mbgl
		GROUT | 0.0-1.0 mbgl
		PERMIT N° | 449007

Is a Notice of Proposed Variation, Variation Order or Site Instruction Required? (Please circle) Yes (No)

Provide Details: –

Further Inspection and/or Testing Required on above Work: –

Are there any H&S requirements to be considered for future works? NO

Has the site been reinstated suitably (left clean and tidy)? YES

Daily Record Sheet

001

Client: MFS		Job No: 12616808	
Job Name: MFS ANGLE PARK DSI		Date: 26/10/2023	
GHD Representative:	TERRENCE WILSON	Arrival Time: 08:30	Departure Time: 14:20
Weather Conditions:	(Please circle) (Fine) Overcast Light Rain Heavy Rain Other_____		
Works Being Undertaken:	GROUNDWATER WELL DEVELOPMENT		

Personnel/Contractor(s) Present (List all); Inducted into GHD H&SP?	Inducted	Arrival Time	Departure Time
TERRENCE WILSON	YES	08:30	14:20

Photographs Taken: (Please circle) Yes No If Yes, list below or attach photo register.

Location	Time	Record of Activities / Issues Encountered / Discussions with Client/Contractors / Sketch / Notes
MFS ANGLE PARK	08:30	ARRIVE ON SITE AND SIGN IN AT CONTROL ROOM
	08:40	COMMENCE WITH GROUNDWATER MONITORING WELL
		DEVELOPMENT
		MW01 – MW05
		INITIALLY VERY HIGH SEDIMENT LOADS ENCOUNTERED
		AT ALL WELLS, ESPECIALLY AT MW03 AND MW04 –
		LARGER VOLUME OF GROUNDWATER PURGED AT ALL
		WELLS THAN REQUIRED DUE TO HIGH SEDIMENT LOAD
		SD 01 – STORMWATER PIT GRID REMOVED TO COLLECT
		SEDIMENT SAMPLE – NO SEDIMENT IN DRAIN TO
		COLLECT
		SD 02 – NO SEDIMENT IN DRAIN TO COLLECT
	14:20	SIGN OUT AND LEAVE SITE

Is a Notice of Proposed Variation, Variation Order or Site Instruction Required? (Please circle) Yes (No)

Provide Details: —

Further Inspection and/or Testing Required on above Work: —

Are there any H&S requirements to be considered for future works? NO

Has the site been reinstated suitably (left clean and tidy)? YES

GHD

Daily Record Sheet

001

Client: MFS		Job No: 12616808	
Job Name: MFS ANGLE PARK DSI		Date: 02/11/2023	
GHD Representative:	TERRENCE WILSON	Arrival Time: 08:00	Departure Time: 15:30
Weather Conditions:	(Please circle) (Fine) Overcast Light Rain Heavy Rain Other_____		
Works Being Undertaken:	GROUNDWATER SAMPLING		

Personnel/Contractor(s) Present (List all); Inducted into GHD H&SP?	Inducted	Arrival Time	Departure Time

Photographs Taken: (Please circle) Yes No If Yes, list below or attach photo register.

Location	Time	Record of Activities / Issues Encountered / Discussions with Client/Contractors / Sketch / Notes
MFS ANGLE PARK	08:00	ARRIVE ON SITE AND SIGN IN AT CONTROL ROOM
	08:10	DAN FROM LINKUP CONSTRUCTION ARRIVES ON SITE FOR
		SURVEYING OF MONITORING WELLS
	08:30	COMMENCE WITH GROUNDWATER SAMPLING
		MW05 (FD01, FS01)
		MW02
		MW03
		MW04
		MW01 (QC01, QC01A)
	12:30	DAN LEAVES SITE
		FB01 – FIELD BLANK COLLECTED FOR PFAS DSI
		TB01 – TRIP BLANK FOR DD WORK
		RB01 – RINSATE BLANK COLLECTED OFF IP FOR PFAS DSI
		"RINSATE" – RINSATE BLANK COLLECTED OFF IP FOR DD WORK.
	15:30	SIGN OUT AND LEAVE SITE

Is a Notice of Proposed Variation, Variation Order or Site Instruction Required? (Please circle) Yes (No)

Provide Details: –

Further Inspection and/or Testing Required on above Work:	–

Are there any H&S requirements to be considered for future works? NO

Has the site been reinstated suitably (left clean and tidy)? YES

Appendix K

Laboratory Reports

QUALITY CONTROL REPORT

Work Order	: **EM2319031**	Page	: 1 of 18
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: ANGUS ROBINSON	Contact	: Kieren Burns
Address	: Level 4, 211 VICTORIA SQUARE ADELAIDE SA, AUSTRALIA 5000	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +61881625130
Project	: MFS ANGLE PARK DSI	Date Samples Received	: 25-Oct-2023
Order number	: ----	Date Analysis Commenced	: 31-Oct-2023
C-O-C number	: ----	Issue Date	: 03-Nov-2023
Sampler	: TW		
Site	: ----		
Quote number	: EM23GHDSER0022		
No. of samples received	: 121		
No. of samples analysed	: 48		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5394736)									
EM2319031-002	BH01_0.2-0.3	EA055: Moisture Content	----	0.1	%	3.4	3.4	0.0	0% - 20%
EM2319031-028	BH04_0.6-0.7	EA055: Moisture Content	----	0.1	%	16.8	17.6	4.5	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5394737)									
EM2319031-056	BH08_0.2-0.3	EA055: Moisture Content	----	0.1	%	6.9	6.0	14.0	0% - 20%
EM2319031-090	MW04_0.2-0.3	EA055: Moisture Content	----	0.1	%	6.1	6.1	0.0	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5394738)									
EM2319031-110	TP1_0-0.2	EA055: Moisture Content	----	0.1	%	4.1	4.5	7.4	0% - 20%
EM2319284-004	Anonymous	EA055: Moisture Content	----	0.1	%	17.2	16.8	2.4	0% - 50%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5399790)									
EM2319031-122	SD03 Dry portion of sample 107	EA055: Moisture Content	----	0.1	%	6.2	6.7	7.8	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5397576)									
EM2319031-002	BH01_0.2-0.3	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0003	0.0003	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0499	0.0456	9.0	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EM2319031-028	BH04_0.6-0.7	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0024	0.0024	0.0	0% - 50%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	0.0008	0.0007	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.151	0.164	8.3	0% - 20%

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5397576) - continued									
EM2319031-028	BH04_0.6-0.7	EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5397577)									
EM2319031-056	BH08_0.2-0.3	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0038	0.0045	16.3	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EM2319031-090	MW04_0.2-0.3	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0039	0.0038	3.0	0% - 50%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0029	0.0029	0.0	0% - 50%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5398926)									
EM2319031-110	TP1_0-0.2	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0014	0.0014	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EM2319352-008	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5399997)									
EM2319031-122	SD03 Dry portion of sample 107	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0010	0.0006	47.5	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0097	0.0082	17.2	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5397576)									
EM2319031-002	BH01_0.2-0.3	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0002	0.0003	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0002	0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5397576) - continued									
EM2319031-002	BH01_0.2-0.3	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	0.0005	0.0004	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	0.0002	0.0003	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EM2319031-028	BH04_0.6-0.7	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0007	0.0007	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0008	0.0008	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	0.0003	0.0003	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0006	0.0006	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5397577)									
EM2319031-056	BH08_0.2-0.3	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EM2319031-090	MW04_0.2-0.3	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0005	0.0006	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	0.0003	0.0003	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0037	0.0043	16.8	0% - 20%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5397577) - continued									
EM2319031-090	MW04_0.2-0.3	EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5398926)									
EM2319031-110	TP1_0-0.2	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0003	0.0004	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EM2319352-008	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5399997)									
EM2319031-122	SD03 Dry portion of sample 107	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0009	0.0008	16.9	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0006	0.0005	32.7	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	0.0004	0.0003	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	0.0004	0.0003	40.6	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	0.0007	0.0006	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	0.0005	0.0004	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5397576)									
EM2319031-002	BH01_0.2-0.3	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5397576) - continued									
EM2319031-002	BH01_0.2-0.3	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EM2319031-028	BH04_0.6-0.7	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5397577)									
EM2319031-056	BH08_0.2-0.3	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EM2319031-090	MW04_0.2-0.3	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5397577) - continued									
EM2319031-090	MW04_0.2-0.3	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5398926)									
EM2319031-110	TP1_0-0.2	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EM2319352-008	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5399997)									

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5399997) - continued									
EM2319031-122	SD03 Dry portion of sample 107	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	0.0041	0.0049	16.2	0% - 20%
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5397576)									
EM2319031-002	BH01_0.2-0.3	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EM2319031-028	BH04_0.6-0.7	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	0.0074	0.0080	7.5	0% - 50%
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5397577)									
EM2319031-056	BH08_0.2-0.3	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	0.0012	0.0016	31.4	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5397577) - continued									
EM2319031-090	MW04_0.2-0.3	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5398926)									
EM2319031-110	TP1_0-0.2	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EM2319352-008	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5399997)									
EM2319031-122	SD03 Dry portion of sample 107	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	0.0005	0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	0.0010	0.0011	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	0.0007	0.0007	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5397576)									
EM2319031-002	BH01_0.2-0.3	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0513	0.0471	8.5	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0502	0.0459	8.9	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0506	0.0464	8.7	0% - 20%
EM2319031-028	BH04_0.6-0.7	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.164	0.178	7.9	0% - 20%

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231P: PFAS Sums (QC Lot: 5397576) - continued									
EM2319031-028	BH04_0.6-0.7	EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.153	0.166	8.1	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.163	0.177	8.0	0% - 20%
EP231P: PFAS Sums (QC Lot: 5397577)									
EM2319031-056	BH08_0.2-0.3	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0050	0.0061	19.8	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0038	0.0045	16.9	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0050	0.0061	19.8	0% - 20%
EM2319031-090	MW04_0.2-0.3	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0113	0.0119	5.2	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0068	0.0067	1.5	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0113	0.0119	5.2	0% - 20%
EP231P: PFAS Sums (QC Lot: 5398926)									
EM2319031-110	TP1_0-0.2	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0017	0.0020	16.2	0% - 50%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0014	0.0014	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0017	0.0020	16.2	0% - 50%
EM2319352-008	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5399997)									
EM2319031-122	SD03 Dry portion of sample 107	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0205	0.0189	8.1	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0107	0.0088	19.5	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0137	0.0117	15.7	0% - 20%

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5397576)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00111 mg/kg	93.7	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	76.0	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00114 mg/kg	84.8	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	97.6	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	82.2	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00121 mg/kg	90.2	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5397577)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00111 mg/kg	90.8	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	90.4	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00114 mg/kg	95.4	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	102	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	94.4	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00121 mg/kg	87.9	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5398926)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00111 mg/kg	95.3	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	100	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00114 mg/kg	92.0	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	103	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	80.6	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00121 mg/kg	80.4	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5399997)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00111 mg/kg	92.0	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	73.6	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00114 mg/kg	89.3	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	116	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	96.5	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00121 mg/kg	99.9	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5397576)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	76.4	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.8	69.0	132

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5397576) - continued								
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.8	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.8	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.3	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.5	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.6	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	80.3	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	111	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5397577)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	91.6	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.4	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.5	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.7	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.8	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.7	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.4	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	98.9	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5398926)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	88.2	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.9	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.8	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.3	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.1	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.1	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.7	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.8	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.6	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.8	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	99.0	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5399997)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5399997) - continued								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	83.3	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.3	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.1	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.8	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.8	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.5	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.6	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.5	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	77.9	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	99.2	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5397576)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	125	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	88.6	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	106	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	96.6	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.0	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.2	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5397577)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.1	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	100	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	102	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	96.0	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	98.4	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.7	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5398926)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5398926) - continued								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	103	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	94.9	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	90.1	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	88.1	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.7	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.0	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5399997)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.9	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	115	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	80.8	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	98.1	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	104	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.1	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	72.0	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5397576)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	97.8	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00119 mg/kg	100	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	97.8	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00121 mg/kg	86.8	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5397577)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	100	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00119 mg/kg	100	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	93.8	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00121 mg/kg	91.3	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5398926)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	95.6	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00119 mg/kg	108	64.0	140

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5398926) - continued								
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	90.4	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00121 mg/kg	81.8	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5399997)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	97.0	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00119 mg/kg	94.7	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	113	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00121 mg/kg	81.0	70.0	130
EP231P: PFAS Sums (QCLot: 5397576)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231P: PFAS Sums (QCLot: 5397577)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231P: PFAS Sums (QCLot: 5398926)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231P: PFAS Sums (QCLot: 5399997)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5397576)							

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5397576) - continued							
EM2319031-003	BH01_0.6-0.7	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00111 mg/kg	87.3	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00118 mg/kg	75.8	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00114 mg/kg	# Not Determined	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	109	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	71.9	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00121 mg/kg	95.9	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5397577)							
EM2319031-060	BH08_1.9-2.0	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00111 mg/kg	81.1	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00118 mg/kg	78.0	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00114 mg/kg	93.0	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	87.4	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	96.9	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00121 mg/kg	86.6	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5398926)							
EM2319031-111	TP1_0.4-0.5	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00111 mg/kg	85.3	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00118 mg/kg	85.0	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00114 mg/kg	84.1	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	96.3	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	86.2	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00121 mg/kg	86.0	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5397576)							
EM2319031-003	BH01_0.6-0.7	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	84.8	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	90.1	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	93.0	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	84.7	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	88.1	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	104	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	91.6	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	99.2	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	90.8	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	83.0	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	99.4	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5397577)							
EM2319031-060	BH08_1.9-2.0	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	100.0	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	89.3	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	91.8	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	88.2	71.0	131

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5397577) - continued							
EM2319031-060	BH08_1.9-2.0	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	90.8	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	86.2	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	75.0	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	97.2	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	96.3	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	84.8	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	94.6	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5398926)							
EM2319031-111	TP1_0.4-0.5	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	84.3	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	97.8	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	99.6	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	88.7	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	92.0	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	89.7	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	93.4	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	91.2	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	87.2	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	89.2	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	95.6	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5397576)							
EM2319031-003	BH01_0.6-0.7	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	104	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	119	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	78.9	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	90.6	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	94.2	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	91.8	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	88.4	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5397577)							
EM2319031-060	BH08_1.9-2.0	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	93.4	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	106	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	92.3	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	86.9	70.0	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5397577) - continued							
EM2319031-060	BH08_1.9-2.0	EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	98.9	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	89.2	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	81.4	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5398926)							
EM2319031-111	TP1_0.4-0.5	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	91.3	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	84.7	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	89.0	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	88.7	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	96.7	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	96.4	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	95.4	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5397576)							
EM2319031-003	BH01_0.6-0.7	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	89.3	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00119 mg/kg	96.1	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	101	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00121 mg/kg	70.9	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5397577)							
EM2319031-060	BH08_1.9-2.0	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	91.2	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00119 mg/kg	102	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	89.2	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00121 mg/kg	94.2	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5398926)							
EM2319031-111	TP1_0.4-0.5	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	93.9	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00119 mg/kg	105	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	97.7	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00121 mg/kg	88.5	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM2319031**	Page	: 1 of 10
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: ANGUS ROBINSON	Telephone	: +61881625130
Project	: MFS ANGLE PARK DSI	Date Samples Received	: 25-Oct-2023
Site	: ----	Issue Date	: 03-Nov-2023
Sampler	: TW	No. of samples received	: 121
Order number	: ----	No. of samples analysed	: 48

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	EM2319031--003	BH01_0.6-0.7	**Perfluorohexane sulfonic acid (PFHxS)**	355-46-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Analysis Holding Time Compliance

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

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

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

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

Matrix: **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)								
BH01_0.2-0.3,	BH01_0.6-0.7,	**23-Oct-2023**	**----**	----	**----**	**31-Oct-2023**	06-Nov-2023	✓
BH01_1.3-1.4,	BH02_0.08-0.2,							
BH02_0.9-1.0,	BH03_0.01-0.3,							
BH03_0.4-0.5,	BH03_1.2-1.3,							
BH04_PAVER,	BH04_0.08-0.3,							
BH04_0.6-0.7,	BH04_1.4-1.5,							
BH05_0.3-0.4,	BH06_0.0-0.1,							
BH06_0.4-0.5,	BH07_PAVER,							
BH07_0.08-0.18,	BH07_0.9-1.0,							
BH07_2.4-2.5,	BH08_0.08-0.15,							
BH08_0.2-0.3,	BH08_1.9-2.0							
HDPE Soil Jar (EA055)								

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) - Continued								
MW01_0.01-0.1,	MW01_0.4-0.5,	**24-Oct-2023**	**----**	----	**----**	**31-Oct-2023**	07-Nov-2023	✓
MW01_1.8-1.9,	MW02_0.3-0.4,							
MW02_0.5-0.6,	MW03_0-0.1,							
MW03_0.3-0.4,	MW03_1.4-1.5,							
MW04_0.2-0.3,	MW04_0.75-0.85,							
MW04_2.1-2.2,	MW05_PAVER,							
MW05_0.08-0.12,	MW05_1.4-1.5,							
MW05_3.4-3.5,	TP1_0-0.2,							
TP1_0.4-0.5,	TP1_0.9-1.0,							
TP2_0-0.2,	TP2_0.4-0.5,							
TP2_0.9-1.0,	TP3_0.0-0.2							
HDPE Soil Jar (EA055)								
SD03 - Dry portion of sample 107		**25-Oct-2023**	**----**	----	**----**	**02-Nov-2023**	08-Nov-2023	✓
HDPE Soil Jar (EA055)								
SD03,	SS01,	**25-Oct-2023**	**----**	----	**----**	**31-Oct-2023**	08-Nov-2023	✓
SS02								

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X) BH01_0.2-0.3, BH01_0.6-0.7, BH01_1.3-1.4, BH02_0.08-0.2, BH02_0.9-1.0, BH03_0.01-0.3, BH03_0.4-0.5, BH03_1.2-1.3, BH04_PAVER, BH04_0.08-0.3, BH04_0.6-0.7, BH04_1.4-1.5, BH05_0.3-0.4, BH06_0.0-0.1, BH06_0.4-0.5, BH07_PAVER, BH07_0.08-0.18, BH07_0.9-1.0, BH07_2.4-2.5, BH08_0.08-0.15, BH08_0.2-0.3, BH08_1.9-2.0	**23-Oct-2023**	**01-Nov-2023**	20-Apr-2024	✓	**02-Nov-2023**	11-Dec-2023	✓
HDPE Soil Jar (EP231X) MW01_0.01-0.1, MW01_0.4-0.5, MW01_1.8-1.9, MW02_0.3-0.4, MW02_0.5-0.6, MW03_0-0.1, MW03_0.3-0.4, MW03_1.4-1.5, MW04_0.2-0.3, MW04_0.75-0.85, MW04_2.1-2.2, MW05_PAVER, MW05_0.08-0.12, MW05_1.4-1.5, MW05_3.4-3.5	**24-Oct-2023**	**01-Nov-2023**	21-Apr-2024	✓	**02-Nov-2023**	11-Dec-2023	✓
HDPE Soil Jar (EP231X) TP1_0-0.2, TP1_0.4-0.5, TP1_0.9-1.0, TP2_0-0.2, TP2_0.4-0.5, TP2_0.9-1.0, TP3_0.0-0.2	**24-Oct-2023**	**02-Nov-2023**	21-Apr-2024	✓	**02-Nov-2023**	12-Dec-2023	✓
HDPE Soil Jar (EP231X) SD03, SS01, SS02	**25-Oct-2023**	**01-Nov-2023**	22-Apr-2024	✓	**02-Nov-2023**	11-Dec-2023	✓
HDPE Soil Jar (EP231X) SD03 - Dry portion of sample 107	**25-Oct-2023**	**02-Nov-2023**	22-Apr-2024	✓	**03-Nov-2023**	12-Dec-2023	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X) BH01_0.2-0.3, BH01_0.6-0.7, BH01_1.3-1.4, BH02_0.08-0.2, BH02_0.9-1.0, BH03_0.01-0.3, BH03_0.4-0.5, BH03_1.2-1.3, BH04_PAVER, BH04_0.08-0.3, BH04_0.6-0.7, BH04_1.4-1.5, BH05_0.3-0.4, BH06_0.0-0.1, BH06_0.4-0.5, BH07_PAVER, BH07_0.08-0.18, BH07_0.9-1.0, BH07_2.4-2.5, BH08_0.08-0.15, BH08_0.2-0.3, BH08_1.9-2.0	**23-Oct-2023**	**01-Nov-2023**	20-Apr-2024	✓	**02-Nov-2023**	11-Dec-2023	✓
HDPE Soil Jar (EP231X) MW01_0.01-0.1, MW01_0.4-0.5, MW01_1.8-1.9, MW02_0.3-0.4, MW02_0.5-0.6, MW03_0-0.1, MW03_0.3-0.4, MW03_1.4-1.5, MW04_0.2-0.3, MW04_0.75-0.85, MW04_2.1-2.2, MW05_PAVER, MW05_0.08-0.12, MW05_1.4-1.5, MW05_3.4-3.5	**24-Oct-2023**	**01-Nov-2023**	21-Apr-2024	✓	**02-Nov-2023**	11-Dec-2023	✓
HDPE Soil Jar (EP231X) TP1_0-0.2, TP1_0.4-0.5, TP1_0.9-1.0, TP2_0-0.2, TP2_0.4-0.5, TP2_0.9-1.0, TP3_0.0-0.2	**24-Oct-2023**	**02-Nov-2023**	21-Apr-2024	✓	**02-Nov-2023**	12-Dec-2023	✓
HDPE Soil Jar (EP231X) SD03, SS01, SS02	**25-Oct-2023**	**01-Nov-2023**	22-Apr-2024	✓	**02-Nov-2023**	11-Dec-2023	✓
HDPE Soil Jar (EP231X) SD03 - Dry portion of sample 107	**25-Oct-2023**	**02-Nov-2023**	22-Apr-2024	✓	**03-Nov-2023**	12-Dec-2023	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X) BH01_0.2-0.3, BH01_0.6-0.7, BH01_1.3-1.4, BH02_0.08-0.2, BH02_0.9-1.0, BH03_0.01-0.3, BH03_0.4-0.5, BH03_1.2-1.3, BH04_PAVER, BH04_0.08-0.3, BH04_0.6-0.7, BH04_1.4-1.5, BH05_0.3-0.4, BH06_0.0-0.1, BH06_0.4-0.5, BH07_PAVER, BH07_0.08-0.18, BH07_0.9-1.0, BH07_2.4-2.5, BH08_0.08-0.15, BH08_0.2-0.3, BH08_1.9-2.0	**23-Oct-2023**	**01-Nov-2023**	20-Apr-2024	✓	**02-Nov-2023**	11-Dec-2023	✓
HDPE Soil Jar (EP231X) MW01_0.01-0.1, MW01_0.4-0.5, MW01_1.8-1.9, MW02_0.3-0.4, MW02_0.5-0.6, MW03_0-0.1, MW03_0.3-0.4, MW03_1.4-1.5, MW04_0.2-0.3, MW04_0.75-0.85, MW04_2.1-2.2, MW05_PAVER, MW05_0.08-0.12, MW05_1.4-1.5, MW05_3.4-3.5	**24-Oct-2023**	**01-Nov-2023**	21-Apr-2024	✓	**02-Nov-2023**	11-Dec-2023	✓
HDPE Soil Jar (EP231X) TP1_0-0.2, TP1_0.4-0.5, TP1_0.9-1.0, TP2_0-0.2, TP2_0.4-0.5, TP2_0.9-1.0, TP3_0.0-0.2	**24-Oct-2023**	**02-Nov-2023**	21-Apr-2024	✓	**02-Nov-2023**	12-Dec-2023	✓
HDPE Soil Jar (EP231X) SD03, SS01, SS02	**25-Oct-2023**	**01-Nov-2023**	22-Apr-2024	✓	**02-Nov-2023**	11-Dec-2023	✓
HDPE Soil Jar (EP231X) SD03 - Dry portion of sample 107	**25-Oct-2023**	**02-Nov-2023**	22-Apr-2024	✓	**03-Nov-2023**	12-Dec-2023	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
BH01_0.2-0.3, BH01_0.6-0.7, BH01_1.3-1.4, BH02_0.08-0.2, BH02_0.9-1.0, BH03_0.01-0.3, BH03_0.4-0.5, BH03_1.2-1.3, BH04_PAVER, BH04_0.08-0.3, BH04_0.6-0.7, BH04_1.4-1.5, BH05_0.3-0.4, BH06_0.0-0.1, BH06_0.4-0.5, BH07_PAVER, BH07_0.08-0.18, BH07_0.9-1.0, BH07_2.4-2.5, BH08_0.08-0.15, BH08_0.2-0.3, BH08_1.9-2.0	**23-Oct-2023**	**01-Nov-2023**	20-Apr-2024	✓	**02-Nov-2023**	11-Dec-2023	✓
HDPE Soil Jar (EP231X)							
MW01_0.01-0.1, MW01_0.4-0.5, MW01_1.8-1.9, MW02_0.3-0.4, MW02_0.5-0.6, MW03_0-0.1, MW03_0.3-0.4, MW03_1.4-1.5, MW04_0.2-0.3, MW04_0.75-0.85, MW04_2.1-2.2, MW05_PAVER, MW05_0.08-0.12, MW05_1.4-1.5, MW05_3.4-3.5	**24-Oct-2023**	**01-Nov-2023**	21-Apr-2024	✓	**02-Nov-2023**	11-Dec-2023	✓
HDPE Soil Jar (EP231X)							
TP1_0-0.2, TP1_0.4-0.5, TP1_0.9-1.0, TP2_0-0.2, TP2_0.4-0.5, TP2_0.9-1.0, TP3_0.0-0.2	**24-Oct-2023**	**02-Nov-2023**	21-Apr-2024	✓	**02-Nov-2023**	12-Dec-2023	✓
HDPE Soil Jar (EP231X)							
SD03, SS01, SS02	**25-Oct-2023**	**01-Nov-2023**	22-Apr-2024	✓	**02-Nov-2023**	11-Dec-2023	✓
HDPE Soil Jar (EP231X)							
SD03 - Dry portion of sample 107	**25-Oct-2023**	**02-Nov-2023**	22-Apr-2024	✓	**03-Nov-2023**	12-Dec-2023	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X) BH01_0.2-0.3, BH01_0.6-0.7, BH01_1.3-1.4, BH02_0.08-0.2, BH02_0.9-1.0, BH03_0.01-0.3, BH03_0.4-0.5, BH03_1.2-1.3, BH04_PAVER, BH04_0.08-0.3, BH04_0.6-0.7, BH04_1.4-1.5, BH05_0.3-0.4, BH06_0.0-0.1, BH06_0.4-0.5, BH07_PAVER, BH07_0.08-0.18, BH07_0.9-1.0, BH07_2.4-2.5, BH08_0.08-0.15, BH08_0.2-0.3, BH08_1.9-2.0	**23-Oct-2023**	**01-Nov-2023**	20-Apr-2024	✓	**02-Nov-2023**	11-Dec-2023	✓
HDPE Soil Jar (EP231X) MW01_0.01-0.1, MW01_0.4-0.5, MW01_1.8-1.9, MW02_0.3-0.4, MW02_0.5-0.6, MW03_0-0.1, MW03_0.3-0.4, MW03_1.4-1.5, MW04_0.2-0.3, MW04_0.75-0.85, MW04_2.1-2.2, MW05_PAVER, MW05_0.08-0.12, MW05_1.4-1.5, MW05_3.4-3.5	**24-Oct-2023**	**01-Nov-2023**	21-Apr-2024	✓	**02-Nov-2023**	11-Dec-2023	✓
HDPE Soil Jar (EP231X) TP1_0-0.2, TP1_0.4-0.5, TP1_0.9-1.0, TP2_0-0.2, TP2_0.4-0.5, TP2_0.9-1.0, TP3_0.0-0.2	**24-Oct-2023**	**02-Nov-2023**	21-Apr-2024	✓	**02-Nov-2023**	12-Dec-2023	✓
HDPE Soil Jar (EP231X) SD03, SS01, SS02	**25-Oct-2023**	**01-Nov-2023**	22-Apr-2024	✓	**02-Nov-2023**	11-Dec-2023	✓
HDPE Soil Jar (EP231X) SD03 - Dry portion of sample 107	**25-Oct-2023**	**02-Nov-2023**	22-Apr-2024	✓	**03-Nov-2023**	12-Dec-2023	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	7	58	**12.07**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	7	56	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	56	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	56	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	56	**5.36**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

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

CERTIFICATE OF ANALYSIS

Work Order	: **EM2319031**	Page	: 1 of 23
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: ANGUS ROBINSON	Contact	: Kieren Burns
Address	: Level 4, 211 VICTORIA SQUARE ADELAIDE SA, AUSTRALIA 5000	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +61881625130
Project	: MFS ANGLE PARK DSI	Date Samples Received	: 25-Oct-2023 11:10
Order number	: ----	Date Analysis Commenced	: 31-Oct-2023
C-O-C number	: ----	Issue Date	: 03-Nov-2023 11:41
Sampler	: TW		
Site	: ----		
Quote number	: EM23GHDSER0022		
No. of samples received	: 121		
No. of samples analysed	: 48		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC

General Comments

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

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

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

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

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

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

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

- This is a split WO with EM2319124
- EP231X: LOR for particular sample EM2319031-107 has been raised due to the high moisture content.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH01_0.2-0.3	BH01_0.6-0.7	BH01_1.3-1.4	BH02_0.08-0.2	BH02_0.9-1.0
			Sampling date / time	23-Oct-2023 00:00	23-Oct-2023 00:00	23-Oct-2023 00:00	23-Oct-2023 00:00	23-Oct-2023 00:00
Compound	CAS Number	LOR	Unit	EM2319031-002	EM2319031-003	EM2319031-005	EM2319031-011	EM2319031-012
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**3.4**	**5.4**	**14.0**	**7.2**	**14.1**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	**0.0003**	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	**0.0004**	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	**0.0003**	**0.0036**	**0.0035**	<0.0002	**0.0008**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	**0.0499**	**0.0004**	**0.0032**	**0.0010**	**0.0022**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	**0.0002**	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	**0.0002**	**0.0004**	**0.0005**	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	**0.0005**	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	**0.0002**	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH01_0.2-0.3	BH01_0.6-0.7	BH01_1.3-1.4	BH02_0.08-0.2	BH02_0.9-1.0
			Sampling date / time	23-Oct-2023 00:00	23-Oct-2023 00:00	23-Oct-2023 00:00	23-Oct-2023 00:00	23-Oct-2023 00:00
Compound	CAS Number	LOR	Unit	EM2319031-002	EM2319031-003	EM2319031-005	EM2319031-011	EM2319031-012
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	**0.0513**	**0.0044**	**0.0079**	**0.0010**	**0.0030**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	**0.0502**	**0.0040**	**0.0067**	**0.0010**	**0.0030**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	**0.0506**	**0.0044**	**0.0075**	**0.0010**	**0.0030**
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	**106**	**114**	**104**	**111**	**119**
13C8-PFOA	----	0.0002	%	**102**	**102**	**101**	**105**	**98.2**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH03_0.01-0.3	BH03_0.4-0.5	BH03_1.2-1.3	BH04_PAVER	BH04_0.08-0.3
			Sampling date / time	23-Oct-2023 00:00	23-Oct-2023 00:00	23-Oct-2023 00:00	23-Oct-2023 00:00	23-Oct-2023 00:00
Compound	CAS Number	LOR	Unit	EM2319031-017	EM2319031-018	EM2319031-020	EM2319031-026	EM2319031-027
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**6.3**	**7.9**	**9.8**	**5.0**	**6.2**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	**0.0006**	**0.0003**	**0.0006**	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	**0.0005**	<0.0002	**0.0005**	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	**0.0103**	**0.0020**	**0.0048**	**0.0015**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	**0.0005**	<0.0002	**0.0003**	**0.0004**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	**0.0073**	**0.0165**	**0.0062**	**0.0069**	**0.312**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**0.0021**
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	**0.0004**	<0.0002	**0.0005**	**0.0003**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	**0.0012**	**0.0005**	**0.0021**	**0.0005**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**0.0002**	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	**0.0004**	**0.0003**	**0.0004**	**0.0002**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**0.0005**
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**0.0018**
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH03_0.01-0.3	BH03_0.4-0.5	BH03_1.2-1.3	BH04_PAVER	BH04_0.08-0.3
				Sampling date / time	23-Oct-2023 00:00	23-Oct-2023 00:00	23-Oct-2023 00:00	23-Oct-2023 00:00	23-Oct-2023 00:00
Compound	CAS Number	LOR	Unit		EM2319031-017	EM2319031-018	EM2319031-020	EM2319031-026	EM2319031-027
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	**0.0036**	**0.0053**
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	**0.0381**
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0073**	**0.0304**	**0.0093**	**0.0199**	**0.363**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0073**	**0.0268**	**0.0082**	**0.0117**	**0.314**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0073**	**0.0294**	**0.0093**	**0.0191**	**0.358**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**118**	**118**	**120**	**106**	**124**
13C8-PFOA	----	0.0002	%		**98.5**	**101**	**99.0**	**87.5**	**100**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH04_0.6-0.7	BH04_1.4-1.5	BH05_0.3-0.4	BH06_0.0-0.1	BH06_0.4-0.5
				Sampling date / time	23-Oct-2023 00:00	23-Oct-2023 00:00	23-Oct-2023 00:00	23-Oct-2023 00:00	23-Oct-2023 00:00
Compound	CAS Number	LOR	Unit		EM2319031-028	EM2319031-030	EM2319031-036	EM2319031-038	EM2319031-040
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**16.8**	**17.4**	**14.3**	**8.7**	**13.3**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	**0.0003**	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	**0.0004**	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		**0.0024**	**0.0250**	**0.0013**	<0.0002	**0.0101**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		**0.0008**	**0.0032**	<0.0002	<0.0002	**0.0011**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.151**	**0.112**	**0.0038**	**0.0072**	**0.0643**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	**0.0003**	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		**0.0007**	**0.0026**	<0.0002	<0.0002	**0.0005**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		**0.0008**	**0.0026**	**0.0006**	<0.0002	**0.0006**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		**0.0003**	**0.0013**	<0.0002	<0.0002	**0.0004**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		**0.0006**	**0.0028**	<0.0002	<0.0002	**0.0011**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0003**	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BH04_0.6-0.7	BH04_1.4-1.5	BH05_0.3-0.4	BH06_0.0-0.1	BH06_0.4-0.5
			Sampling date / time	23-Oct-2023 00:00	23-Oct-2023 00:00	23-Oct-2023 00:00	23-Oct-2023 00:00	23-Oct-2023 00:00
Compound	CAS Number	LOR	Unit	EM2319031-028	EM2319031-030	EM2319031-036	EM2319031-038	EM2319031-040
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	**0.0074**	**0.0020**	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	**0.164**	**0.152**	**0.0060**	**0.0075**	**0.0781**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	**0.153**	**0.137**	**0.0051**	**0.0072**	**0.0744**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	**0.163**	**0.148**	**0.0060**	**0.0072**	**0.0770**
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	**134**	**111**	**100**	**102**	**106**
13C8-PFOA	----	0.0002	%	**99.0**	**101**	**100**	**99.5**	**102**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH07_PAVER	BH07_0.08-0.18	BH07_0.9-1.0	BH07_2.4-2.5	BH08_0.08-0.15
				Sampling date / time	23-Oct-2023 00:00	23-Oct-2023 00:00	23-Oct-2023 00:00	23-Oct-2023 00:00	23-Oct-2023 00:00
Compound	CAS Number	LOR	Unit		EM2319031-046	EM2319031-047	EM2319031-049	EM2319031-051	EM2319031-055
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**3.1**	**7.5**	**16.5**	**17.3**	**5.2**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	**0.0006**	**0.0004**	**0.0024**	**0.0028**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	**0.0003**	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	**0.0002**	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH07_PAVER	BH07_0.08-0.18	BH07_0.9-1.0	BH07_2.4-2.5	BH08_0.08-0.15
				Sampling date / time	23-Oct-2023 00:00	23-Oct-2023 00:00	23-Oct-2023 00:00	23-Oct-2023 00:00	23-Oct-2023 00:00
Compound	CAS Number	LOR	Unit		EM2319031-046	EM2319031-047	EM2319031-049	EM2319031-051	EM2319031-055
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	**0.0026**
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	**0.0006**	**0.0009**	**0.0024**	**0.0054**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	**0.0006**	**0.0004**	**0.0024**	**0.0028**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	**0.0006**	**0.0009**	**0.0024**	**0.0054**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**112**	**116**	**112**	**121**	**116**
13C8-PFOA	----	0.0002	%		**88.0**	**102**	**102**	**102**	**102**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH08_0.2-0.3	BH08_1.9-2.0	MW01_0.01-0.1	MW01_0.4-0.5	MW01_1.8-1.9
				Sampling date / time	23-Oct-2023 00:00	23-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00
Compound	CAS Number	LOR	Unit		EM2319031-056	EM2319031-060	EM2319031-064	EM2319031-066	EM2319031-068
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**6.9**	**15.7**	**5.8**	**11.0**	**17.2**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**0.0002**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0004**	**0.0002**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	**0.0005**	**0.0076**	**0.0033**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0038**	<0.0002	**0.0088**	**0.0036**	**0.0004**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	**0.0005**	<0.0002	**0.0006**	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0009**	**0.0004**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0004**	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0005**	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BH08_0.2-0.3	BH08_1.9-2.0	MW01_0.01-0.1	MW01_0.4-0.5	MW01_1.8-1.9
				Sampling date / time	23-Oct-2023 00:00	23-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00
Compound	CAS Number	LOR	Unit		EM2319031-056	EM2319031-060	EM2319031-064	EM2319031-066	EM2319031-068
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		**0.0012**	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0050**	**0.0005**	**0.0093**	**0.0140**	**0.0045**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0038**	<0.0002	**0.0093**	**0.0112**	**0.0037**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0050**	**0.0005**	**0.0093**	**0.0136**	**0.0043**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**124**	**104**	**125**	**92.8**	**101**
13C8-PFOA	----	0.0002	%		**94.5**	**97.8**	**94.5**	**99.2**	**109**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW02_0.3-0.4	MW02_0.5-0.6	MW03_0-0.1	MW03_0.3-0.4	MW03_1.4-1.5
				Sampling date / time	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00
Compound	CAS Number	LOR	Unit		EM2319031-073	EM2319031-074	EM2319031-081	EM2319031-082	EM2319031-084
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**13.6**	**25.0**	**4.2**	**10.2**	**25.1**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	**0.0003**	**0.0025**	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0002**	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0003**	<0.0002	**0.0100**	**0.0064**	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	**0.0002**	**0.0006**	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0006**	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	**0.0002**	**0.0005**	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0009**	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	MW02_0.3-0.4	MW02_0.5-0.6	MW03_0-0.1	MW03_0.3-0.4	MW03_1.4-1.5
			Sampling date / time	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00
Compound	CAS Number	LOR	Unit	EM2319031-073	EM2319031-074	EM2319031-081	EM2319031-082	EM2319031-084
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	**0.0003**	<0.0002	**0.0107**	**0.0117**	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	**0.0003**	<0.0002	**0.0103**	**0.0089**	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	**0.0003**	<0.0002	**0.0107**	**0.0115**	<0.0002
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	**105**	**110**	**122**	**117**	**118**
13C8-PFOA	----	0.0002	%	**108**	**93.2**	**105**	**103**	**91.0**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW04_0.2-0.3	MW04_0.75-0.85	MW04_2.1-2.2	MW05_PAVER	MW05_0.08-0.12
				Sampling date / time	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00
Compound	CAS Number	LOR	Unit		EM2319031-090	EM2319031-091	EM2319031-094	EM2319031-098	EM2319031-099
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**6.1**	**23.8**	**16.8**	**3.0**	**5.8**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		**0.0039**	<0.0002	<0.0002	**0.0006**	**0.0006**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0029**	<0.0002	<0.0002	**0.0012**	**0.0314**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**0.0020**
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		**0.0005**	<0.0002	<0.0002	**0.0002**	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		**0.0037**	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**0.0004**
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**0.0002**
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW04_0.2-0.3	MW04_0.75-0.85	MW04_2.1-2.2	MW05_PAVER	MW05_0.08-0.12
				Sampling date / time	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00
Compound	CAS Number	LOR	Unit		EM2319031-090	EM2319031-091	EM2319031-094	EM2319031-098	EM2319031-099
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**0.0017**
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	**0.0008**
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	**0.0005**
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0113**	<0.0002	<0.0002	**0.0020**	**0.0376**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0068**	<0.0002	<0.0002	**0.0018**	**0.0320**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0113**	<0.0002	<0.0002	**0.0020**	**0.0328**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**113**	**106**	**113**	**96.0**	**102**
13C8-PFOA	----	0.0002	%		**98.0**	**105**	**110**	**95.8**	**96.8**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW05_1.4-1.5	MW05_3.4-3.5	SD03	SS01	SS02
				Sampling date / time	24-Oct-2023 00:00	24-Oct-2023 00:00	25-Oct-2023 00:00	25-Oct-2023 00:00	25-Oct-2023 00:00
Compound	CAS Number	LOR	Unit		EM2319031-102	EM2319031-104	EM2319031-107	EM2319031-108	EM2319031-109
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**18.9**	**18.8**	**73.9**	**2.8**	**2.4**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		**0.0003**	**0.0010**	<0.0005	**0.0007**	**0.0150**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		**0.0004**	**0.0011**	<0.0005	**0.0009**	**0.0146**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		**0.0088**	**0.0081**	**0.0006**	**0.0044**	**0.0618**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		**0.0022**	**0.0004**	<0.0005	<0.0002	**0.0019**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0082**	**0.0101**	**0.0089**	**0.0014**	**0.0245**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		**0.001**	<0.001	<0.002	<0.001	**0.004**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		**0.0058**	**0.0008**	<0.0006	**0.0002**	**0.0089**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		**0.0071**	**0.0026**	<0.0006	**0.0016**	**0.0418**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		**0.0012**	**0.0003**	<0.0005	**0.0002**	**0.0031**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		**0.0015**	**0.0003**	<0.0005	**0.0004**	**0.0040**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	**0.0010**	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0012	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	**0.0045**	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0012	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	MW05_1.4-1.5	MW05_3.4-3.5	SD03	SS01	SS02
				Sampling date / time	24-Oct-2023 00:00	24-Oct-2023 00:00	25-Oct-2023 00:00	25-Oct-2023 00:00	25-Oct-2023 00:00
Compound	CAS Number	LOR	Unit		EM2319031-102	EM2319031-104	EM2319031-107	EM2319031-108	EM2319031-109
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0012	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0012	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0012	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0005	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0012	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	**0.0008**	<0.0012	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0012	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0015	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0365**	**0.0255**	**0.0150**	**0.0098**	**0.180**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0170**	**0.0182**	**0.0095**	**0.0058**	**0.0863**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0339**	**0.0240**	**0.0095**	**0.0089**	**0.163**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**120**	**96.8**	**92.5**	**116**	**102**
13C8-PFOA	----	0.0002	%		**97.2**	**108**	**95.0**	**105**	**104**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP1_0-0.2	TP1_0.4-0.5	TP1_0.9-1.0	TP2_0-0.2	TP2_0.4-0.5
				Sampling date / time	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00
Compound	CAS Number	LOR	Unit		EM2319031-110	EM2319031-111	EM2319031-112	EM2319031-115	EM2319031-116
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**4.1**	**19.9**	**17.4**	**1.2**	**10.6**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	**0.0003**	**0.0002**	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0014**	<0.0002	<0.0002	**0.0004**	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		**0.0003**	**0.0005**	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	**0.0002**	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP1_0-0.2	TP1_0.4-0.5	TP1_0.9-1.0	TP2_0-0.2	TP2_0.4-0.5
				Sampling date / time	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00
Compound	CAS Number	LOR	Unit		EM2319031-110	EM2319031-111	EM2319031-112	EM2319031-115	EM2319031-116
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0017**	**0.0010**	**0.0002**	**0.0004**	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0014**	**0.0003**	**0.0002**	**0.0004**	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0017**	**0.0010**	**0.0002**	**0.0004**	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**104**	**101**	**92.1**	**100**	**104**
13C8-PFOA	----	0.0002	%		**107**	**100**	**102**	**103**	**99.9**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP2_0.9-1.0	TP3_0.0-0.2	SD03 Dry portion of sample 107	----	----
			Sampling date / time	24-Oct-2023 00:00	24-Oct-2023 00:00	25-Oct-2023 00:00	----	----
Compound	CAS Number	LOR	Unit	EM2319031-117	EM2319031-120	EM2319031-122	--------	--------
				Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**14.7**	**9.4**	**6.2**	**----**	**----**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	**0.0010**	**----**	**----**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	**0.0024**	**0.0097**	**----**	**----**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	**----**	**----**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	**0.0009**	**----**	**----**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	**0.0006**	**----**	**----**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	**0.0004**	**----**	**----**
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	**0.0004**	**----**	**----**
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	**0.0007**	**----**	**----**
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	**0.0005**	**----**	**----**
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	**----**	**----**
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	**0.0041**	**----**	**----**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP2_0.9-1.0	TP3_0.0-0.2	SD03 Dry portion of sample 107	----	----
				Sampling date / time	24-Oct-2023 00:00	24-Oct-2023 00:00	25-Oct-2023 00:00	----	----
Compound	CAS Number	LOR	Unit		EM2319031-117	EM2319031-120	EM2319031-122	--------	--------
					Result	Result	Result	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	**0.0005**	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	**0.0010**	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	**0.0007**	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	**0.0024**	**0.0205**	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	**0.0024**	**0.0107**	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	**0.0024**	**0.0137**	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**103**	**93.4**	**128**	----	----
13C8-PFOA	----	0.0002	%		**100**	**100**	**93.5**	----	----

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	68	136
13C8-PFOA	----	69	133

Samples received without CoC

CLIENT / SENDER:	GHD
PROJECT:	ANGLE PARK - 12616808
CONTACT NAME:	ANGUS ROBINSON
CONTACT NUMBER:	0431 177 498
CARRIER:	
CONNOTE REFERENCE:	
SAMPLER:	
NUMBER OF SAMPLES/MATRIX:	
Client services notified by:	

COC SEQUENCE NUMBER (Circle)

COC:	1	2	3	4	5	6	7
OF:	1	2	3	4	5	6	7

SAMPLES RECEIVED BY:

DATE/TIME: 25/10, 11:40

ANALYSIS RECEIVED BY:

DATE/TIME:

Comments

FREIGHT

Environmental Division
Melbourne
Work Order Reference
EM2319031

Telephone : – 61-3-8549 9600

LAB ID	SAMPLE ID	DATE	MATRIX	NUMBER OF CONTAINERS	Additional Information
	MW04-0.75.0ST	24/10			
	TP12-0.6-0.7	24/10			
	ehr				
			TOTAL		

Samples received without CoC

Environmental Division
Melbourne
Work Order Reference
EM2319031

Telephone : – 61-3-8549 9600

CLIENT / SENDER:	GHD
PROJECT:	ANGLE PARK - 12616808
CONTACT NAME:	ANGUS ROBINSON
CONTACT NUMBER:	0431177 498
CARRIER:	
CONNOTE REFERENCE:	
SAMPLER:	
NUMBER OF SAMPLES/MATRIX:	
Client services notified by:	

COC SEQUENCE NUMBER (Circle)

COC:	1	2	3	4	5	6	7
OF:	1	2	3	4	5	6	7

SAMPLES RECEIVED BY:

DATE/TIME: 25/10, 11:40

ANALYSIS RECEIVED BY:

DATE/TIME:

Comments

FREIGHT

LAB ID	SAMPLE DETAILS: SAMPLE ID	DATE	MATRIX	NUMBER OF CONTAINERS	Additional Information
	MW04-0.75.0.75	24/10			
	TP12-0.6-0.7	24/10			
			TOTAL		

CHAIN OF CUSTODY

ALS Environmental

ALS Laboratory: please tick →

CLIENT: GHD	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)	☒ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: Adelaide		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
	ALS QUOTE:	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT: MFS ANGLE PARK DSI	ORDER NO.: 12616808	COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Angus Robinson	CONTACT PH: 0431 177 498	OF: 1 2 3 4 5 6 7	Other comment:
SAMPLER: TW (Terrence Wilson)	SAMPLER MOBILE: 0467 034 756		
COC emailed to ALS? YES	EDD FORMAT (or default): Esdat		
Email Reports to: Angus.Robinson@ghd.com; Terrence.Wilson@ghd.com; Ben.Petticrew@ghd.com; GHDLabReports@ghd.com			
Email Invoice to: Angus.Robinson@ghd.com; accountspayableAU@ghd.com			

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Terrence Wilson	*Kieren Burns*		
DATE/TIME: 24 October 2023; 15:00	DATE/TIME: 24 October 2023; 15:00	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	PFAS (Long Suite) - Standard LOR	HOLD							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	BH01_0.01-0.1	23/10/2023	S	P	1		X							
2	BH01_0.2-0.3	23/10/2023	S	P	1	X								
3	BH01_0.6-0.7	23/10/2023	S	P	1	X								
4	BH01_0.7-0.8	23/10/2023	S	P	1		X							
5	BH01_1.3-1.4	23/10/2023	S	P	1	X								
6	BH01_1.9-2.0	23/10/2023	S	P	1		X							
7	BH01_2.5-2.6	23/10/2023	S	P	1		X							
8	BH01_3.5-3.6	23/10/2023	S	P	1		X							
9	BH01_4.4-4.5	23/10/2023	S	P	1		X							
10	BH02_PAVER	23/10/2023	S	P	1		X							
11	BH02_0.08-0.2	23/10/2023	S	P	1	X								
12	BH02_0.9-1.0	23/10/2023	S	P	1	X								
				TOTAL	12	5	7							

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

CHAIN OF CUSTODY

ALS Environmental

ALS Laboratory: please tick →

CLIENT: GHD	**TURNAROUND REQUIREMENTS :** (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)	☒ Standard TAT **(List due date):**	**FOR LABORATORY USE ONLY (Circle)**
OFFICE: Adelaide		☐ Non Standard or urgent TAT **(List due date):**	Custody Seal Intact? Yes No N/A
	ALS QUOTE:	**COC SEQUENCE NUMBER (Circle)**	Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT: MFS ANGLE PARK DSI	**ORDER NO.: 12616808**	COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Angus Robinson	**CONTACT PH: 0431 177 498**	OF: 1 2 3 4 5 6 7	Other comment:

SAMPLER: TW (Terrence Wilson)	**SAMPLER MOBILE: 0467 034 756**	**RELINQUISHED BY:**	**RECEIVED BY:**	**RELINQUISHED BY:**	**RECEIVED BY:**
COC emailed to ALS? YES	**EDD FORMAT (or default): Esdat**	*Terrence Wilson*	*Kieren Burns*		
Email Reports to: Angus.Robinson@ghd.com; Terrence.Wilson@ghd.com; Ben.Petticrew@ghd.com; GHDLabReports@ghd.com		DATE/TIME: 24 October 2023; 15:00	DATE/TIME: 24 October 2023; 15:00	DATE/TIME:	DATE/TIME:
Email Invoice to: Angus.Robinson@ghd.com; accountspayableAU@ghd.com					

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where **Metals** are required, specify **Total** (unfiltered bottle required) or **Dissolved** (field filtered bottle required).							Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	PFAS (Long Suite) - Standard LOR	HOLD						Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
13	BH02_1.6-1.7	23/10/2023	S	P	1		X						
14	BH02_2.6-2.7	23/10/2023	S	P	1		X						
15	BH02_3.1-3.2	23/10/2023	S	P	1		X						
16	BH02_3.9-4.0	23/10/2023	S	P	1		X						
17	BH03_0.01-0.3	23/10/2023	S	P	1	X							
18	BH03_0.4-0.5	23/10/2023	S	P	1	X							
19	BH03_0.6-0.7	23/10/2023	S	P	1		X						
20	BH03_1.2-1.3	23/10/2023	S	P	1	X							
21	BH03_1.3-1.4	23/10/2023	S	P	1		X						
22	BH03_2.0-2.1	23/10/2023	S	P	1		X						
23	BH03_2.3-2.4	23/10/2023	S	P	1		X						
24	BH03_3.3-3.4	23/10/2023	S	P	1		X						
				TOTAL	12	3	9						

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

CHAIN OF CUSTODY

ALS Environmental

ALS Laboratory: please tick →

CLIENT: GHD	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)	☒ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: Adelaide		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
	ALS QUOTE:	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT: MFS ANGLE PARK DSI	ORDER NO.: 12616808	COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Angus Robinson	CONTACT PH: 0431 177 498	OF: 1 2 3 4 5 6 7	Other comment:

SAMPLER: TW (Terrence Wilson)	SAMPLER MOBILE: 0467 034 756	RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
COC emailed to ALS? YES	EDD FORMAT (or default): Esdat	*Terrence Wilson*	*Kieren Burns*		
Email Reports to: Angus.Robinson@ghd.com; Terrence.Wilson@ghd.com; Ben.Petticrew@ghd.com; GHDLabReports@ghd.com		DATE/TIME: 24 October 2023; 15:00	DATE/TIME: 24 October 2023; 15:00	DATE/TIME:	DATE/TIME:
Email Invoice to: Angus.Robinson@ghd.com; accountspayableAU@ghd.com					

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	PFAS (Long Suite) - Standard LOR	HOLD							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
25	BH03_3.9-4.0	23/10/2023	S	P	1		X							
26	BH04_PAVER	23/10/2023	S	P	1	X								
27	BH04_0.08-0.3	23/10/2023	S	P	1	X								
28	BH04_0.6-0.7	23/10/2023	S	P	1	X								
29	BH04_0.9-1.0	23/10/2023	S	P	1		X							
30	BH04_1.4-1.5	23/10/2023	S	P	1	X								
31	BH04_2.2-2.3	23/10/2023	S	P	1		X							
32	BH04_3.1-3.2	23/10/2023	S	P	1		X							
33	BH04_3.4-3.5	23/10/2023	S	P	1		X							
34	BH05_0.0-0.02	23/10/2023	S	P	1	X								
35	BH05_0.05-0.15	23/10/2023	S	P	1		X							
36	BH05_0.3-0.4	23/10/2023	S	P	1	X								
				TOTAL	12	6	6							

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

CHAIN OF CUSTODY

ALS Environmental

ALS Laboratory: please tick →

CLIENT: GHD	**TURNAROUND REQUIREMENTS :** (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)	☒ Standard TAT **(List due date):**	**FOR LABORATORY USE ONLY (Circle)**
OFFICE: Adelaide		☐ Non Standard or urgent TAT **(List due date):**	Custody Seal Intact? Yes No N/A
	ALS QUOTE:	**COC SEQUENCE NUMBER (Circle)**	Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT: MFS ANGLE PARK DSI	**ORDER NO.:** 12616808	COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Angus Robinson	**CONTACT PH:** 0431 177 498	OF: 1 2 3 4 5 6 7	Other comment:
SAMPLER: TW (Terrence Wilson)	**SAMPLER MOBILE:** 0467 034 756		
COC emailed to ALS? YES	**EDD FORMAT (or default):** Esdat		

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Terrence Wilson	*Kieren Burns*		
DATE/TIME: 24 October 2023; 15:00	DATE/TIME: 24 October 2023; 15:00	DATE/TIME:	DATE/TIME:

Email Reports to: Angus.Robinson@ghd.com; Terrence.Wilson@ghd.com; Ben.Petticrew@ghd.com; GHDLabReports@ghd.com

Email Invoice to: Angus.Robinson@ghd.com; accountspayableAU@ghd.com

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where **Metals** are required, specify **Total** (unfiltered bottle required) or **Dissolved** (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	PFAS (Long Suite) - Standard LOR	HOLD							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
37	BH05_4.4-4.5	23/10/2023	S	P	1		X							
38	BH06_0.0-0.1	23/10/2023	S	P	1	X								
39	BH06_0.15-0.25	23/10/2023	S	P	1		X							
40	BH06_0.4-0.5	23/10/2023	S	P	1	X								
41	BH06_0.9-1.0	23/10/2023	S	P	1		X							
42	BH06_1.4-1.5	23/10/2023	S	P	1		X							
43	BH06_2.1-2.2	23/10/2023	S	P	1		X							
44	BH06_3.1-3.2	23/10/2023	S	P	1		X							
45	BH06_3.9-4.0	23/10/2023	S	P	1		X							
46	BH07_PAVER	23/10/2023	S	P	1	X								
47	BH07_0.08-0.18	23/10/2023	S	P	1	X								
48	BH07_0.35-0.45	23/10/2023	S	P	1		X							
				TOTAL	12	4	8							

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

CHAIN OF CUSTODY

ALS Environmental

ALS Laboratory: please tick →

CLIENT: GHD	**TURNAROUND REQUIREMENTS :** (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☒ Standard TAT **(List due date):**	**FOR LABORATORY USE ONLY (Circle)**
OFFICE: Adelaide		☐ Non Standard or urgent TAT **(List due date):**	Custody Seal Intact? Yes No N/A
	ALS QUOTE:	**COC SEQUENCE NUMBER (Circle)**	Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT: MFS ANGLE PARK DSI	**ORDER NO.:** 12616808	COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Angus Robinson	**CONTACT PH:** 0431 177 498	OF: 1 2 3 4 5 6 7	Other comment:

SAMPLER: TW (Terrence Wilson)	**SAMPLER MOBILE:** 0467 034 756	**RELINQUISHED BY:**	**RECEIVED BY:**	**RELINQUISHED BY:**	**RECEIVED BY:**
COC emailed to ALS? YES	**EDD FORMAT (or default):** Esdat	*Terrence Wilson*	*Kieren Burns*		
Email Reports to: Angus.Robinson@ghd.com; Terrence.Wilson@ghd.com; Ben.Petticrew@ghd.com; GHDLabReports@ghd.com		DATE/TIME: 24 October 2023; 15:00	DATE/TIME: 24 October 2023; 15:00	DATE/TIME:	DATE/TIME:
Email Invoice to: Angus.Robinson@ghd.com; accountspayableAU@ghd.com					

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where **Metals** are required, specify **Total** (unfiltered bottle required) or **Dissolved** (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	PFAS (Long Suite) - Standard LOR	HOLD							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
49	BH07_0.9-1.0	23/10/2023	S	P	1	X								
50	BH07_1.4-1.5	23/10/2023	S	P	1		X							
51	BH07_2.4-2.5	23/10/2023	S	P	1	X								
52	BH07_3.4-3.5	23/10/2023	S	P	1		X							
53	BH07_3.9-4.0	23/10/2023	S	P	1		X							
54	BH08_PAVER	23/10/2023	S	P	1		X							
55	BH08_0.08-0.15	23/10/2023	S	P	1	X								
56	BH08_0.2-0.3	23/10/2023	S	P	1	X								
57	BH08_0.4-0.5	23/10/2023	S	P	1		X							
58	BH08_0.5-0.6	23/10/2023	S	P	1		X							
59	BH08_0.9-1.0	23/10/2023	S	P	1		X							
60	BH08_1.9-2.0	23/10/2023	S	P	1	X								
				TOTAL	12	5	7							

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

CHAIN OF CUSTODY

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CLIENT: GHD	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☒ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: Adelaide		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
	ALS QUOTE:	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT: MFS ANGLE PARK DSI	ORDER NO.: 12616808	COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Angus Robinson	CONTACT PH: 0431 177 498	OF: 1 2 3 4 5 6 7	Other comment:

SAMPLER: TW (Terrence Wilson)	SAMPLER MOBILE: 0467 034 756	RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
COC emailed to ALS? YES	EDD FORMAT (or default): Esdat	*Terrence Wilson*	*Kieren Burns*		
Email Reports to: Angus.Robinson@ghd.com; Terrence.Wilson@ghd.com; Ben.Petticrew@ghd.com; GHDLabReports@ghd.com		DATE/TIME: 24 October 2023; 15:00	DATE/TIME: 24 October 2023; 15:00	DATE/TIME:	DATE/TIME:
Email Invoice to: Angus.Robinson@ghd.com; accountspayableAU@ghd.com					

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	PFAS (Long Suite) - Standard LOR	HOLD							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
61	BH08_2.9-3.0	23/10/2023	S	P	1		X							
62	BH08_3.9-4.0	23/10/2023	S	P	1		X							
63	BH08_4.4-4.5	23/10/2023	S	P	1		X							
64	MW01_0.01-0.1	24/10/2023	S	P	1	X								
65	MW01_0.1-0.2	24/10/2023	S	P	1		X							
66	MW01_0.4-0.5	24/10/2023	S	P	1	X								
67	MW01_0.85-0.95	24/10/2023	S	P	1		X							
68	MW01_1.8-1.9	24/10/2023	S	P	1	X								
69	MW01_2.8-2.9	24/10/2023	S	P	1		X							
70	MW01_3.8-3.9	24/10/2023	S	P	1		X							
71	MW01_4.9-5.0	24/10/2023	S	P	1		X							
72	MW02_0-0.1	24/10/2023	S	P	1		X							
				TOTAL	12	3	9							

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

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CLIENT: GHD	**TURNAROUND REQUIREMENTS :** (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☒ Standard TAT **(List due date):**	**FOR LABORATORY USE ONLY (Circle)**
OFFICE: Adelaide		☐ Non Standard or urgent TAT **(List due date):**	Custody Seal Intact? Yes No N/A
	ALS QUOTE:	**COC SEQUENCE NUMBER (Circle)**	Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT: MFS ANGLE PARK DSI	**ORDER NO.:** 12616808	COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Angus Robinson	**CONTACT PH:** 0431 177 498	OF: 1 2 3 4 5 6 7	Other comment:

SAMPLER: TW (Terrence Wilson)	**SAMPLER MOBILE:** 0467 034 756	**RELINQUISHED BY:**	**RECEIVED BY:**	**RELINQUISHED BY:**	**RECEIVED BY:**
COC emailed to ALS? YES	**EDD FORMAT (or default):** Esdat	*Terrence Wilson*	*Kieren Burns*		
Email Reports to: Angus.Robinson@ghd.com; Terrence.Wilson@ghd.com; Ben.Petticrew@ghd.com; GHDLabReports@ghd.com		DATE/TIME: 24 October 2023; 15:00	DATE/TIME: 24 October 2023; 15:00	DATE/TIME:	DATE/TIME:
Email Invoice to: Angus.Robinson@ghd.com; accountspayableAU@ghd.com					

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where **Metals** are required, specify **Total** (unfiltered bottle required) or **Dissolved** (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	PFAS (Long Suite) - Standard LOR	HOLD							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
73	MW02_0.3-0.4	24/10/2023	S	P	1	X								
74	MW02_0.5-0.6	24/10/2023	S	P	1	X								
75	MW02_0.9-1.0	24/10/2023	S	P	1		X							
76	MW02_1.7-1.8	24/10/2023	S	P	1		X							
77	MW02_2.4-2.5	24/10/2023	S	P	1		X							
78	MW02_3.4-3.5	24/10/2023	S	P	1		X							
79	MW02_3.9-4.0	24/10/2023	S	P	1		X							
80	MW02_4.9-5.0	24/10/2023	S	P	1		X							
81	MW03_0-0.1	24/10/2023	S	P	1	X								
82	MW03_0.3-0.4	24/10/2023	S	P	1	X								
83	MW03_0.75-0.85	24/10/2023	S	P	1		X							
84	MW03_1.4-1.5	24/10/2023	S	P	1	X								
				TOTAL	12	5	7							

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

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OFFICE: Adelaide		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
	ALS QUOTE:	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT: MFS ANGLE PARK DSI	ORDER NO.: 12616808	COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Angus Robinson	CONTACT PH: 0431 177 498	OF: 1 2 3 4 5 6 7	Other comment:
SAMPLER: TW (Terrence Wilson)	SAMPLER MOBILE: 0467 034 756		
COC emailed to ALS? YES	EDD FORMAT (or default): Esdat		
Email Reports to: Angus.Robinson@ghd.com; Terrence.Wilson@ghd.com; Ben.Petticrew@ghd.com; GHDLabReports@ghd.com			
Email Invoice to: Angus.Robinson@ghd.com; accountspayableAU@ghd.com			

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Terrence Wilson	*Kieren Burns*		
DATE/TIME: 24 October 2023; 15:00	DATE/TIME: 24 October 2023; 15:00	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where **Metals** are required, specify **Total** (unfiltered bottle required) or **Dissolved** (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	PFAS (Long Suite) - Standard LOR	HOLD							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
85	MW03_1.8-1.9	24/10/2023	S	P	1		X							
86	MW03_2.8-2.9	24/10/2023	S	P	1		X							
87	MW03_3.8-3.9	24/10/2023	S	P	1		X							
88	MW03_4.8-5.0	24/10/2023	S	P	1		X							
89	MW04_0-0.07	24/10/2023	S	P	1		X							
90	MW04_0.2-0.3	24/10/2023	S	P	1	X								
91	MW04_0.75-0.85	24/10/2023	S	P	1	X								
92	MW04_1.4-1.5	24/10/2023	S	P	1		X							
93	MW04_1.8-1.9	24/10/2023	S	P	1		X							
94	MW04_2.1-2.2	24/10/2023	S	P	1	X								
95	MW04_3.1-3.2	24/10/2023	S	P	1		X							
96	MW04_4.1-4.2	24/10/2023	S	P	1		X							
				TOTAL	12	3	9							

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

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OFFICE: Adelaide		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
	ALS QUOTE:	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT: MFS ANGLE PARK DSI	ORDER NO.: 12616808	COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Angus Robinson	CONTACT PH: 0431 177 498	OF: 1 2 3 4 5 6 7	Other comment:
SAMPLER: TW (Terrence Wilson)	SAMPLER MOBILE: 0467 034 756	RELINQUISHED BY:	RECEIVED BY:
COC emailed to ALS? YES	EDD FORMAT (or default): Esdat	*Terrence Wilson*	*Kieren Burns*
Email Reports to: Angus.Robinson@ghd.com; Terrence.Wilson@ghd.com; Ben.Petticrew@ghd.com; GHDLabReports@ghd.com		DATE/TIME: 24 October 2023; 15:00	DATE/TIME: 24 October 2023; 15:00
Email Invoice to: Angus.Robinson@ghd.com; accountspayableAU@ghd.com		RELINQUISHED BY:	RECEIVED BY:
		DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	PFAS (Long Suite) - Standard LOR	HOLD							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
97	MW04_4.9-5.0	24/10/2023	S	P	1		X							
98	MW05_PAVER	24/10/2023	S	P	1	X								
99	MW05_0.08-0.12	24/10/2023	S	P	1	X								
100	MW05_0.2-0.3	24/10/2023	S	P	1		X							
101	MW05_0.85-0.95	24/10/2023	S	P	1		X							
102	MW05_1.4-1.5	24/10/2023	S	P	1	X								
103	MW05_2.4-2.5	24/10/2023	S	P	1		X							
104	MW05_3.4-3.5	24/10/2023	S	P	1	X								
105	MW05_3.9-4.0	24/10/2023	S	P	1		X							
106	MW05_4.9-5.0	24/10/2023	S	P	1		X							
107	SD03	25/10/2023	S	P	1	X								
108	SS01	25/10/2023	S	P	1	X								
				TOTAL	12	6	6							

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V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

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CLIENT: GHD	**TURNAROUND REQUIREMENTS :** (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)	☒ Standard TAT **(List due date):**
OFFICE: Adelaide		☐ Non Standard or urgent TAT **(List due date):**
	ALS QUOTE:	**COC SEQUENCE NUMBER (Circle)**
PROJECT: MFS ANGLE PARK DSI	**ORDER NO.:** 12616808	COC: 1 2 3 4 5 6 7
PROJECT MANAGER: Angus Robinson	**CONTACT PH:** 0431 177 498	OF: 1 2 3 4 5 6 7
SAMPLER: TW (Terrence Wilson)	**SAMPLER MOBILE:** 0467 034 756	
COC emailed to ALS? YES	**EDD FORMAT (or default):** Esdat	
Email Reports to: Angus.Robinson@ghd.com; Terrence.Wilson@ghd.com; Ben.Petticrew@ghd.com; GHDLabReports@ghd.com		
Email Invoice to: Angus.Robinson@ghd.com; accountspayableAU@ghd.com		

FOR LABORATORY USE ONLY (Circle)

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

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Terrence Wilson	*Kieren Burns*		
DATE/TIME: 24 October 2023; 15:00	DATE/TIME: 24 October 2023; 15:00	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where **Metals** are required, specify **Total** (unfiltered bottle required) or **Dissolved** (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	PFAS (Long Suite) - Standard LOR	HOLD							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
109	SS02	25/10/2023	S	P	1	X								
110	TP1_0-0.2	24/10/2023	S	P	1	X								
111	TP1_0.4-0.5	24/10/2023	S	P	1	X								
112	TP1_0.9-1.0	24/10/2023	S	P	1	X								
113	TP1_1.4-1.5	24/10/2023	S	P	1		X							
114	TP1_1.9-2.0	24/10/2023	S	P	1		X							
115	TP2_0-0.2	24/10/2023	S	P	1	X								
116	TP2_0.4-0.5	24/10/2023	S	P	1	X								
117	TP2_0.9-1.0	24/10/2023	S	P	1	X								
118	TP2_1.4-1.5	24/10/2023	S	P	1		X							
119	TP2_1.9-2.0	24/10/2023	S	P	1		X							
120	TP3_0.0-0.2	24/10/2023	S	P	1	X								
				TOTAL	12	8	4							

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V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

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CLIENT: GHD	**TURNAROUND REQUIREMENTS :** (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)	☒ Standard TAT **(List due date):**	**FOR LABORATORY USE ONLY (Circle)**
OFFICE: Adelaide		☐ Non Standard or urgent TAT **(List due date):**	Custody Seal Intact? Yes No N/A
	ALS QUOTE:	**COC SEQUENCE NUMBER (Circle)**	Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT: MFS ANGLE PARK DSI	**ORDER NO.:** 12616808	COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Angus Robinson	**CONTACT PH:** 0431 177 498	OF: 1 2 3 4 5 6 7	Other comment:

SAMPLER: TW (Terrence Wilson)	**SAMPLER MOBILE:** 0467 034 756	**RELINQUISHED BY:**	**RECEIVED BY:**	**RELINQUISHED BY:**	**RECEIVED BY:**
COC emailed to ALS? YES	**EDD FORMAT (or default):** Esdat	*Terrence Wilson*	*Kieren Burns*		
Email Reports to: Angus.Robinson@ghd.com; Terrence.Wilson@ghd.com; Ben.Petticrew@ghd.com; GHDLabReports@ghd.com		DATE/TIME: 24 October 2023; 15:00	DATE/TIME: 24 October 2023; 15:00	DATE/TIME:	DATE/TIME:
Email Invoice to: Angus.Robinson@ghd.com; accountspayableAU@ghd.com					

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where **Metals** are required, specify **Total** (unfiltered bottle required) or **Dissolved** (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	PFAS (Long Suite) - Standard LOR	HOLD							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
121	TP3_0.4-0.5	24/10/2023	S	P	1	X								
122	TP6_0.0-0.2	24/10/2023	S	P	1	X								
123	TP6_0.4-0.5	24/10/2023	S	P	1	X								
124	TP6_0.9-1.0	24/10/2023	S	P	1	X								
125	TP6_1.4-1.5	24/10/2023	S	P	1		X							
126	TP6_1.9-2.0	24/10/2023	S	P	1		X							
127	TP5_0.0-0.2	24/10/2023	S	P	1	X								
128	TP5_0.4-0.5	24/10/2023	S	P	1	X								
129	TP5_0.9-1.0	24/10/2023	S	P	1		X							
130	TP5_1.4-1.5	24/10/2023	S	P	1	X								
131	TP5_1.9-2.0	24/10/2023	S	P	1		X							
132	TP8_0.0-0.2	24/10/2023	S	P	1	X								
				TOTAL	12	8	4							

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

CHAIN OF CUSTODY

ALS Environmental

ALS Laboratory: please tick →

CLIENT: GHD	**TURNAROUND REQUIREMENTS :** (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)	☒ Standard TAT **(List due date):**	**FOR LABORATORY USE ONLY (Circle)**
OFFICE: Adelaide		☐ Non Standard or urgent TAT **(List due date):**	Custody Seal Intact? Yes No N/A
	ALS QUOTE:	**COC SEQUENCE NUMBER (Circle)**	Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT: MFS ANGLE PARK DSI	**ORDER NO.:** 12616808	COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Angus Robinson	**CONTACT PH:** 0431 177 498	OF: 1 2 3 4 5 6 7	Other comment:

SAMPLER: TW (Terrence Wilson)	**SAMPLER MOBILE:** 0467 034 756	**RELINQUISHED BY:**	**RECEIVED BY:**	**RELINQUISHED BY:**	**RECEIVED BY:**
COC emailed to ALS? YES	**EDD FORMAT (or default):** Esdat	*Terrence Wilson*	*Kieren Burns*		
Email Reports to: Angus.Robinson@ghd.com; Terrence.Wilson@ghd.com; Ben.Petticrew@ghd.com; GHDLabReports@ghd.com		DATE/TIME: 24 October 2023; 15:00	DATE/TIME: 24 October 2023; 15:00	DATE/TIME:	DATE/TIME:
Email Invoice to: Angus.Robinson@ghd.com; accountspayableAU@ghd.com					

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where **Metals** are required, specify **Total** (unfiltered bottle required) or **Dissolved** (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	PFAS (Long Suite) - Standard LOR	HOLD							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
133	TP8_0.4-0.5	24/10/2023	S	P	1	X								
134	TP8_0.9-1.0	24/10/2023	S	P	1	X								
135	TP8_1.4-1.5	24/10/2023	S	P	1		X							
136	TP8_1.9-2.0	24/10/2023	S	P	1		X							
137	TP9_0.0-0.1	24/10/2023	S	P	1	X								
138	TP9_0.4-0.5	24/10/2023	S	P	1	X								
139	TP9_0.9-1.0	24/10/2023	S	P	1	X								
140	TP9_1.4-1.5	24/10/2023	S	P	1		X							
141	TP9_1.9-2.0	24/10/2023	S	P	1		X							
142	TP11_0.0-0.2	24/10/2023	S	P	1	X								
143	TP11_0.4-0.5	24/10/2023	S	P	1	X								
144	TP11_0.9-1.0	24/10/2023	S	P	1	X								
				TOTAL	12	8	4							

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

CHAIN OF CUSTODY

ALS Environmental

ALS Laboratory: please tick →

CLIENT: GHD	**TURNAROUND REQUIREMENTS :** (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)	☒ Standard TAT **(List due date):**	**FOR LABORATORY USE ONLY (Circle)**
OFFICE: Adelaide		☐ Non Standard or urgent TAT **(List due date):**	Custody Seal Intact? Yes No N/A
	ALS QUOTE:	**COC SEQUENCE NUMBER (Circle)**	Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT: MFS ANGLE PARK DSI	**ORDER NO.:** 12616808	COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Angus Robinson	**CONTACT PH:** 0431 177 498	OF: 1 2 3 4 5 6 7	Other comment:
SAMPLER: TW (Terrence Wilson)	**SAMPLER MOBILE:** 0467 034 756	**RELINQUISHED BY:** *Terrence Wilson*	**RECEIVED BY:** *Kieren Burns*
COC emailed to ALS? YES	**EDD FORMAT (or default):** Esdat	DATE/TIME: 24 October 2023; 15:00	DATE/TIME: 24 October 2023; 15:00
Email Reports to: Angus.Robinson@ghd.com; Terrence.Wilson@ghd.com; Ben.Petticrew@ghd.com; GHDLabReports@ghd.com		**RELINQUISHED BY:** DATE/TIME:	**RECEIVED BY:** DATE/TIME:
Email Invoice to: Angus.Robinson@ghd.com; accountspayableAU@ghd.com			

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where **Metals** are required, specify **Total** (unfiltered bottle required) or **Dissolved** (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	PFAS (Long Suite) - Standard LOR	HOLD							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
145	TP11_1.4-1.5	24/10/2023	S	P	1		X							
146	TP11_1.9-2.0	24/10/2023	S	P	1		X							
147	TP14_0.0-0.2	24/10/2023	S	P	1	X								
148	TP14_0.4-0.5	24/10/2023	S	P	1	X								
149	TP14_0.9-1.0	24/10/2023	S	P	1	X								
150	TP14_1.5-1.6	24/10/2023	S	P	1		X							
151	TP14_1.9-2.0	24/10/2023	S	P	1		X							
152	TP23_0-0.2	24/10/2023	S	P	1	X								
153	TP23_0.3-0.4	24/10/2023	S	P	1	X								
154	TP23_0.9-1.0	24/10/2023	S	P	1	X								
155	TP23_1.4-1.5	24/10/2023	S	P	1		X							
156	TP23_1.9-2.0	24/10/2023	S	P	1		X							
				TOTAL	12	6	6							

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

CHAIN OF CUSTODY

ALS Environmental

ALS Laboratory: please tick →

CLIENT: GHD	**TURNAROUND REQUIREMENTS :** (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)	☒ Standard TAT **(List due date):**	**FOR LABORATORY USE ONLY (Circle)**
OFFICE: Adelaide		☐ Non Standard or urgent TAT **(List due date):**	Custody Seal Intact? Yes No N/A
	ALS QUOTE:	**COC SEQUENCE NUMBER (Circle)**	Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT: MFS ANGLE PARK DSI	**ORDER NO.:** 12616808	COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Angus Robinson	**CONTACT PH:** 0431 177 498	OF: 1 2 3 4 5 6 7	Other comment:
SAMPLER: TW (Terrence Wilson)	**SAMPLER MOBILE:** 0467 034 756		
COC emailed to ALS? YES	**EDD FORMAT (or default):** Esdat		
Email Reports to: Angus.Robinson@ghd.com; Terrence.Wilson@ghd.com; Ben.Petticrew@ghd.com; GHDLabReports@ghd.com			
Email Invoice to: Angus.Robinson@ghd.com; accountspayableAU@ghd.com			

RELINQUISHED BY:	**RECEIVED BY:**	**RELINQUISHED BY:**	**RECEIVED BY:**
Terrence Wilson	*Kieren Burns*		
DATE/TIME: 24 October 2023; 15:00	DATE/TIME: 24 October 2023; 15:00	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where **Metals** are required, specify **Total** (unfiltered bottle required) or **Dissolved** (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	PFAS (Long Suite) - Standard LOR	HOLD							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
157	TP16_0-0.1	25/10/2023	S	P	1	X								
158	TP16_0.2-0.3	25/10/2023	S	P	1		X							
159	TP16_0.4-0.5	25/10/2023	S	P	1		X							
160	TP16_0.9-1.0	25/10/2023	S	P	1	X								
161	TP16_1.4-1.5	25/10/2023	S	P	1		X							
162	TP16_1.9-2.0	25/10/2023	S	P	1	X								
163	TP17_0.0-0.2	24/10/2023	S	P	1	X								
164	TP17_0.4-0.5	24/10/2023	S	P	1		X							
165	TP17_0.9-1.0	24/10/2023	S	P	1	X								
166	TP17_1.4-1.5	24/10/2023	S	P	1		X							
167	TP17_1.9-2.0	24/10/2023	S	P	1	X								
168	TP22_0.9-1.0	24/10/2023	S	P	1	X								
				TOTAL	12	7	5							

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

CHAIN OF CUSTODY

ALS Environmental

ALS Laboratory: please tick →

CLIENT: GHD	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)	☒ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):
OFFICE: Adelaide	ALS QUOTE:	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7
PROJECT: MFS ANGLE PARK DSI	ORDER NO.: 12616808	
PROJECT MANAGER: Angus Robinson	CONTACT PH: 0431 177 498	
SAMPLER: TW (Terrence Wilson)	SAMPLER MOBILE: 0467 034 756	
COC emailed to ALS? YES	EDD FORMAT (or default): Esdat	
Email Reports to: Angus.Robinson@ghd.com; Terrence.Wilson@ghd.com; Ben.Petticrew@ghd.com; GHDLabReports@ghd.com		
Email Invoice to: Angus.Robinson@ghd.com; accountspayableAU@ghd.com		

FOR LABORATORY USE ONLY (Circle)

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

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Terrence Wilson	*Kieren Burns*		
DATE/TIME: 24 October 2023; 15:00	DATE/TIME: 24 October 2023; 15:00	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	PFAS (Long Suite) - Standard LOR	HOLD							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
169	TP22_1.1-1.2	24/10/2023	S	P	1		X							
170	TP22_1.4-1.5	24/10/2023	S	P	1	X								
171	TP22_1.9-2.0	24/10/2023	S	P	1		X							
172	TP15_0.0-0.2	24/10/2023	S	P	1	X								
173	TP15_0.6-0.7	24/10/2023	S	P	1	X								
174	TP15_0.9-1.0	24/10/2023	S	P	1		X							
175	TP15_1.4-1.5	24/10/2023	S	P	1	X								
176	TP15_1.9-2.0	24/10/2023	S	P	1		X							
177	TP12_0.0-0.2	24/10/2023	S	P	1	X								
178	TP12_0.6-0.7	24/10/2023	S	P	1	X								
179	TP12_0.9-1.0	24/10/2023	S	P	1		X							
180	TP12_1.4-1.5	24/10/2023	S	P	1		X							
				TOTAL	12	6	6							

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

CHAIN OF CUSTODY

ALS Environmental

ALS Laboratory: please tick →

CLIENT: GHD	**TURNAROUND REQUIREMENTS :** (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☒ Standard TAT **(List due date):**	**FOR LABORATORY USE ONLY (Circle)**
OFFICE: Adelaide		☐ Non Standard or urgent TAT **(List due date):**	Custody Seal Intact? Yes No N/A
	ALS QUOTE:	**COC SEQUENCE NUMBER (Circle)**	Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT: MFS ANGLE PARK DSI	**ORDER NO.:** 12616808	COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Angus Robinson	**CONTACT PH:** 0431 177 498	OF: 1 2 3 4 5 6 7	Other comment:

SAMPLER: TW (Terrence Wilson)	**SAMPLER MOBILE:** 0467 034 756	**RELINQUISHED BY:**	**RECEIVED BY:**	**RELINQUISHED BY:**	**RECEIVED BY:**
COC emailed to ALS? YES	**EDD FORMAT (or default):** Esdat	*Terrence Wilson*	*Kieren Burns*		
Email Reports to: Angus.Robinson@ghd.com; Terrence.Wilson@ghd.com; Ben.Petticrew@ghd.com; GHDLabReports@ghd.com		DATE/TIME: 24 October 2023; 15:00	DATE/TIME: 24 October 2023; 15:00	DATE/TIME:	DATE/TIME:
Email Invoice to: Angus.Robinson@ghd.com; accountspayableAU@ghd.com					

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where **Metals** are required, specify **Total** (unfiltered bottle required) or **Dissolved** (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	PFAS (Long Suite) - Standard LOR	HOLD							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
181	TP12_1.9-2.0	24/10/2023	S	P	1	X								
182	TP18_0.0-0.2	24/10/2023	S	P	1	X								
183	TP18_0.9-1.0	24/10/2023	S	P	1	X								
184	TP18_1.2-1.3	24/10/2023	S	P	1		X							
185	TP18_1.4-1.5	24/10/2023	S	P	1	X								
186	TP18_1.9-2.0	24/10/2023	S	P	1		X							
187	TP10_0.0-0.2	24/10/2023	S	P	1	X								
188	TP10_0.3-0.4	24/10/2023	S	P	1		X							
189	TP10_0.5-0.6	24/10/2023	S	P	1	X								
190	TP10_0.9-1.0	24/10/2023	S	P	1	X								
191	TP10_1.4-1.5	24/10/2023	S	P	1		X							
192	TP10_1.9-2.0	24/10/2023	S	P	1		X							
				TOTAL	12	7	5							

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

CHAIN OF CUSTODY

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CLIENT: GHD	**TURNAROUND REQUIREMENTS :** (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☒ Standard TAT **(List due date):**	**FOR LABORATORY USE ONLY (Circle)**
OFFICE: Adelaide		☐ Non Standard or urgent TAT **(List due date):**	Custody Seal Intact? Yes No N/A
	ALS QUOTE:	**COC SEQUENCE NUMBER (Circle)**	Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT: MFS ANGLE PARK DSI	**ORDER NO.:** 12616808	COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Angus Robinson	**CONTACT PH:** 0431 177 498	OF: 1 2 3 4 5 6 7	Other comment:
SAMPLER: TW (Terrence Wilson)	**SAMPLER MOBILE:** 0467 034 756		
COC emailed to ALS? YES	**EDD FORMAT (or default):** Esdat		

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Terrence Wilson	*Kieren Burns*		
DATE/TIME: 24 October 2023; 15:00	DATE/TIME: 24 October 2023; 15:00	DATE/TIME:	DATE/TIME:

Email Reports to: Angus.Robinson@ghd.com; Terrence.Wilson@ghd.com; Ben.Petticrew@ghd.com; GHDLabReports@ghd.com

Email Invoice to: Angus.Robinson@ghd.com; accountspayableAU@ghd.com

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where **Metals** are required, specify **Total** (unfiltered bottle required) or **Dissolved** (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	PFAS (Long Suite) - Standard LOR	HOLD							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
193	TP4_0.0-0.2	24/10/2023	S	P	1	X								
194	TP4_0.4-0.5	24/10/2023	S	P	1		X							
195	TP4_0.9-1.0	24/10/2023	S	P	1	X								
196	TP4_1.4-1.5	24/10/2023	S	P	1		X							
197	TP4_1.9-2.0	24/10/2023	S	P	1	X								
198	TP7_0.0-0.2	24/10/2023	S	P	1	X								
199	TP7_0.4-0.5	24/10/2023	S	P	1		X							
200	TP7_0.9-1.0	24/10/2023	S	P	1		X							
201	TP7_1.4-1.5	24/10/2023	S	P	1	X								
202	TP7_1.9-2.0	24/10/2023	S	P	1	X								
				TOTAL	10	6	4							

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

WORKORDER NO: EM

SAMPLE RECEIPT INFORMATION & BOTTLE MAP

To be completed by Sample Login Clerk

WO Log in Details	DATE/TIME	INITIAL
Sorting Commenced:		
Prelogged:		
Logged:		
Time placed in fridge:		
Total Time:		

TURNAROUND APPROVED FOR:
24Hrs **48Hrs** **3Days** **4Days** Std

Approved By: _____

Miscellaneous Bottle(s):

	Plastic	Tin	Glass
Specify Preservative:			
Specify Volume:			mL
ALS Colour:			

F on lid for Red/Green bottle(s):	YES
Sampling date not on sample(s):	YES
Non-ALS Container? (to be highlighted on bottle map)	YES
Soil bags frozen on receipt:	YES
Samples located in contamination box (please list samples)	YES
PO Number Requested:	YES
Temperature Sent:	YES

Receipt Conditions		Packaging		Carrier Details	
Cooler Temp	9.6 °C	Foam Esky		Company:	TNT / AaE / TOLL
Chilling Process	**Cooler Seal**	Hard Esky	5		TasFast AusPost
Ice: In Bag / Frozen / Melted	Intact	By Hand		Client delivery	
Ice Bricks: Frozen / Thawed	Broken	Box / Bag		Courier	
Not Chilled	None	Con-note Number:	3ZIZ500004768		

Work Order Creation BP ONLY Completed		Committal BP ONLY Completed	
DATE	*TIME*	*DATE*	*TIME*
INITIALS		*INITIALS*	

Sample Receipt - To be Completed by Front End Staff

Temperature:
Reading 1 8.9 10.0
Reading 2 10.6
Reading 3 9.1

Samples placed in the freezer

	Yes	No	N/A
Acid Sulfate bags placed in the freezer			
Ultra Trace Nutrient Bottles			

Freezer Number _____

AECOM samples placed in the coolroom ☐ ☐ ☑

Completed by: _____

Colour [redacted]
Number

Any Advice Comments
* All Client communication to be recorded on the COC and copied to LIMS

Supervisor signed off: _____

Sample Receipt Checklist - To be Completed by Login Staff prior to committal

	Yes	No	N/A
Tray numbers entered into LIMS	☐	☐	☐
Red dots added to samples containing Volatiles and/or Dissolved Oxygen	☐	☐	☐
Samples entered into the relevant spreadsheets Holding time, Asbestos, Soil splits.	☐	☐	☐
Samples despatched - Internally and/or Externall	☐	☐	☐

Despatched to: _____

Samples trayed by: _____ Date: _____

Work order committed by: _____ Date: _____

	Yes	No	N/A
COC uploaded prior to committal	☐	☐	☐
Relevant COC comments copied to LIMS	☐	☐	☐
Freight / Forwarding fee added	☐	☐	☐

	N/A	Amber	PFAS
Extra Bottles for QC entered into LIMS	☐	☐	☐

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: GHD	**TURNAROUND REQUIREMENTS :** (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)	☒ Standard TAT **(List due date):**	**FOR LABORATORY USE ONLY (Circle)**
OFFICE: Adelaide		☐ Non Standard or urgent TAT **(List due date):**	Custody Seal Intact? Yes No N/A
	ALS QUOTE:	**COC SEQUENCE NUMBER (Circle)**	Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT: MFS ANGLE PARK DSI	**ORDER NO.:** 12616808	COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Angus Robinson	**CONTACT PH:** 0431 177 498	OF: 1 2 3 4 5 6 7	Other comment:
SAMPLER: TW (Terrence Wilson)	**SAMPLER MOBILE:** 0467 034 756		
COC emailed to ALS? YES	**EDD FORMAT (or default):** Esdat		

RELINQUISHED BY:	**RECEIVED BY:**	**RELINQUISHED BY:**	**RECEIVED BY:**
Terrence Wilson	*Kieren Burns*		
DATE/TIME: 24 October 2023; 15:00	DATE/TIME: 24 October 2023; 15:00	DATE/TIME:	DATE/TIME:

Email Reports to: Angus.Robinson@ghd.com; Terrence.Wilson@ghd.com; Ben.Petticrew@ghd.com; GHDLabReports@ghd.com

Email Invoice to: Angus.Robinson@ghd.com; accountspayableAU@ghd.com

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where **Metals** are required, specify **Total** (unfiltered bottle required) or **Dissolved** (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	PFAS (Long Suite) - Standard LOR	HOLD							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
203	FD01	23/10/2023	S	P	1	X								
→	FS01	23/10/2023	S	P	1	X								Please forward to Eurofins
204	FD02	23/10/2023	S	P	1	X								
→	FS02	23/10/2023	S	P	1	X								Please forward to Eurofins
205	FD03	23/10/2023	S	P	1	X								
→	FS03	23/10/2023	S	P	1	X								Please forward to Eurofins
206	FB01	23/10/2023	W	P	1		X							
207	RB01	23/10/2023	W	P	1	X								
208	FB02	24/10/2023	W	P	1		X							
209	RB02A	24/10/2023	W	P	1	X								
210	FB03	25/10/2023	W	P	1		X							
211	RB03A	25/10/2023	W	P	1	X								
				TOTAL	12	9	3							

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

CHAIN OF CUSTODY

ALS Environmental

ALS Laboratory: please tick →

CLIENT: GHD	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)	☒ Standard TAT (List due date):
OFFICE: Adelaide		☐ Non Standard or urgent TAT (List due date):
	ALS QUOTE:	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7
PROJECT: MFS ANGLE PARK DSI	ORDER NO.: 12616808	
PROJECT MANAGER: Angus Robinson	CONTACT PH: 0431 177 498	
SAMPLER: TW (Terrence Wilson)	SAMPLER MOBILE: 0467 034 756	
COC emailed to ALS? YES	EDD FORMAT (or default): Esdat	
Email Reports to: Angus.Robinson@ghd.com; Terrence.Wilson@ghd.com; Ben.Petticrew@ghd.com; GHDLabReports@ghd.com		
Email Invoice to: Angus.Robinson@ghd.com; accountspayableAU@ghd.com		

FOR LABORATORY USE ONLY (Circle)

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

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Terrence Wilson	*Kieren Burns*		
DATE/TIME: 24 October 2023; 15:00	DATE/TIME: 24 October 2023; 15:00	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	PFAS (Long Suite) - Standard LOR	HOLD							
212	FD04	24/10/2023	S	P	1	X								
→	FS04	24/10/2023	S	P	1	X								Please forward to Eurofins
213	FD05	24/10/2023	S	P	1	X								
→	FS05	24/10/2023	S	P	1	X								Please forward to Eurofins
214	QC1	24/10/2023	S	P	1	X								
→	QC1A	24/10/2023	S	P	1	X								Please forward to Eurofins
215	QC2	24/10/2023	S	P	1	X								
→	QC2A	24/10/2023	S	P	1	X								Please forward to Eurofins
216	QC3	24/10/2023	S	P	1	X								
→	QC3A	24/10/2023	S	P	1	X								Please forward to Eurofins
217	QC4	25/10/2023	S	P	1	X								
→	QC4A	25/10/2023	S	P	1	X								Please forward to Eurofins
				TOTAL	12	12								

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

CHAIN OF CUSTODY

ALS Environmental

ALS Laboratory: please tick →

CLIENT: GHD	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)	☒ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):
OFFICE: Adelaide	ALS QUOTE:	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7
PROJECT: MFS ANGLE PARK DSI	ORDER NO.: 12616808	
PROJECT MANAGER: Angus Robinson	CONTACT PH: 0431 177 498	
SAMPLER: TW (Terrence Wilson)	SAMPLER MOBILE: 0467 034 756	
COC emailed to ALS? YES	EDD FORMAT (or default): Esdat	
Email Reports to: Angus.Robinson@ghd.com; Terrence.Wilson@ghd.com; Ben.Petticrew@ghd.com; GHDLabReports@ghd.com		
Email Invoice to: Angus.Robinson@ghd.com; accountspayableAU@ghd.com		

FOR LABORATORY USE ONLY (Circle)

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

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Terrence Wilson	*Kieren Burns*		
DATE/TIME: 24 October 2023; 15:00	DATE/TIME: 24 October 2023; 15:00	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	PFAS (Long Suite) - Standard LOR	HOLD							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
218	RB02B	24/10/2023	W	P	1	X								
219	RB03B	25/10/2023	W	P	1	X								
				TOTAL	2	2								

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

QUALITY CONTROL REPORT

Work Order	: **EM2319124**	Page	: 1 of 21
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: ANGUS ROBINSON	Contact	: Kieren Burns
Address	: Level 4, 211 VICTORIA SQUARE ADELAIDE SA, AUSTRALIA 5000	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +61881625130
Project	: MFS ANGLE PARK DSI	Date Samples Received	: 26-Oct-2023
Order number	: ----	Date Analysis Commenced	: 31-Oct-2023
C-O-C number	: ----	Issue Date	: 02-Nov-2023
Sampler	: Terrence Wilson		
Site	: ----		
Quote number	: EM23GHDSER0022		
No. of samples received	: 104		
No. of samples analysed	: 62		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Xing Lin	Senior Organic Chemist	Melbourne Inorganics, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5393731)									
EM2319124-121	TP3_0.4-0.5	EA055: Moisture Content	----	0.1	%	6.3	6.3	0.0	0% - 20%
EM2319124-137	TP9_0.0-0.1	EA055: Moisture Content	----	0.1	%	7.7	7.9	2.8	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5393732)									
EM2319124-153	TP23_0.3-0.4	EA055: Moisture Content	----	0.1	%	14.7	14.2	3.6	0% - 20%
EM2319124-172	TP15_0.0-0.2	EA055: Moisture Content	----	0.1	%	5.3	5.2	3.0	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5393733)									
EM2319124-189	TP10_0.5-0.6	EA055: Moisture Content	----	0.1	%	15.1	16.1	6.1	0% - 20%
EM2319124-205	FD03	EA055: Moisture Content	----	0.1	%	6.2	6.4	2.2	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5397731)									
EM2319124-226	TP22_0.0-0.2	EA055: Moisture Content	----	0.1	%	2.3	2.7	15.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5393886)									
EM2319124-121	TP3_0.4-0.5	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EM2319124-137	TP9_0.0-0.1	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0021	0.0020	5.2	0% - 50%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5394696)									
EM2319124-153	TP23_0.3-0.4	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	0.0007	0.0006	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0002	0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EM2319124-172	TP15_0.0-0.2	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0004	0.0004	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0006	0.0006	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5395024)									
EM2318960-007	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EM2319124-204	FD02	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0005	0.0005	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0144	0.0156	7.9	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5398926)									
EM2319031-110	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0014	0.0014	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EM2319352-008	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5393886)									
EM2319124-121	TP3_0.4-0.5	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5393886) - continued									
EM2319124-121	TP3_0.4-0.5	EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EM2319124-137	TP9_0.0-0.1	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5394696)									
EM2319124-153	TP23_0.3-0.4	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0008	0.0007	15.2	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0034	0.0032	5.1	0% - 50%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	0.0004	0.0004	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EM2319124-172	TP15_0.0-0.2	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5394696) - continued									
EM2319124-172	TP15_0.0-0.2	EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5395024)									
EM2318960-007	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EM2319124-204	FD02	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0005	0.0005	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0004	0.0004	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	0.0003	0.0003	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	0.0016	0.0017	6.8	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	0.0006	0.0005	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	0.0008	0.0007	13.8	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	0.0004	0.0003	30.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5398926)									
EM2319031-110	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0003	0.0004	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EM2319352-008	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5398926) - continued									
EM2319352-008	Anonymous	EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5393886)									
EM2319124-121	TP3_0.4-0.5	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EM2319124-137	TP9_0.0-0.1	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5394696)									
EM2319124-153	TP23_0.3-0.4	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5394696) - continued									
EM2319124-153	TP23_0.3-0.4	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EM2319124-172	TP15_0.0-0.2	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5395024)									
EM2318960-007	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EM2319124-204	FD02	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5395024) - continued									
EM2319124-204	FD02	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5398926)									
EM2319031-110	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EM2319352-008	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5393886)									
EM2319124-121	TP3_0.4-0.5	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5393886) - continued									
EM2319124-121	TP3_0.4-0.5	EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EM2319124-137	TP9_0.0-0.1	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5394696)									
EM2319124-153	TP23_0.3-0.4	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EM2319124-172	TP15_0.0-0.2	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5395024)									
EM2318960-007	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5395024) - continued									
EM2319124-204	FD02	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5398926)									
EM2319031-110	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EM2319352-008	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5393886)									
EM2319124-121	TP3_0.4-0.5	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EM2319124-137	TP9_0.0-0.1	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0021	0.0022	4.7	0% - 50%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0021	0.0022	4.7	0% - 50%
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0021	0.0022	4.7	0% - 50%
EP231P: PFAS Sums (QC Lot: 5394696)									
EM2319124-153	TP23_0.3-0.4	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0055	0.0051	7.5	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0002	0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0055	0.0051	7.5	0% - 20%
EM2319124-172	TP15_0.0-0.2	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0010	0.0010	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231P: PFAS Sums (QC Lot: 5394696) - continued									
EM2319124-172	TP15_0.0-0.2	EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0010	0.0010	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0010	0.0010	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5395024)									
EM2318960-007	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EM2319124-204	FD02	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0195	0.0207	6.0	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0149	0.0161	7.7	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0158	0.0170	7.3	0% - 20%
EP231P: PFAS Sums (QC Lot: 5398926)									
EM2319031-110	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0017	0.0020	16.2	0% - 50%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0014	0.0014	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0017	0.0020	16.2	0% - 50%
EM2319352-008	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5393886)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00111 mg/kg	91.9	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	93.9	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00114 mg/kg	96.9	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	91.5	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	103	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00121 mg/kg	88.8	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5394696)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00111 mg/kg	88.0	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	91.4	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00114 mg/kg	89.5	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	103	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	94.5	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00121 mg/kg	98.1	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5395024)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00111 mg/kg	81.6	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	92.2	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00114 mg/kg	95.9	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	101	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	89.2	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00121 mg/kg	97.0	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5398926)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00111 mg/kg	95.3	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	100	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00114 mg/kg	92.0	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	103	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	80.6	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00121 mg/kg	80.4	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5393886)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	85.3	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.4	69.0	132

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5393886) - continued								
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.0	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.8	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.7	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.9	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.1	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.9	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.3	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	96.5	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5394696)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	81.5	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	81.8	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.4	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.3	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.0	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.1	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	83.0	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.0	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	83.7	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	79.1	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	96.7	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5395024)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	89.3	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.7	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.8	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.9	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.9	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.6	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.3	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.5	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.0	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.1	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	104	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5398926)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5398926) - continued								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	88.2	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.9	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.8	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.3	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.1	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.1	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.7	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.8	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.6	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.8	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	99.0	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5393886)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	98.8	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	98.4	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	91.8	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	99.6	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.2	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.1	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5394696)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	90.4	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	88.9	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	88.4	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	103	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.2	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.8	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5395024)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5395024) - continued								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	91.4	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	99.4	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	93.6	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	87.5	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.5	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.4	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5398926)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	103	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	94.9	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	90.1	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	88.1	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.7	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.0	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5393886)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	98.2	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00119 mg/kg	104	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	105	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00121 mg/kg	95.2	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5394696)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	94.9	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00119 mg/kg	97.4	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	101	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00121 mg/kg	85.8	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5395024)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	95.4	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00119 mg/kg	110	64.0	140

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5395024) - continued								
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	88.5	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00121 mg/kg	99.0	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5398926)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	95.6	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00119 mg/kg	108	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	90.4	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00121 mg/kg	81.8	70.0	130
EP231P: PFAS Sums (QCLot: 5393886)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231P: PFAS Sums (QCLot: 5394696)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231P: PFAS Sums (QCLot: 5395024)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231P: PFAS Sums (QCLot: 5398926)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5393452)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.222 µg/L	85.9	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.235 µg/L	94.9	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.228 µg/L	94.5	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	97.6	69.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5393452) - continued								
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	122	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	114	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5393452)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	81.5	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	85.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	82.3	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	87.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	90.8	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	90.1	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	91.3	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	98.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	109	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	108	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5393452)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	104	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	121	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	114	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	89.5	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	94.9	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	98.5	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	94.5	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5393452)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.234 µg/L	91.9	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.238 µg/L	102	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	101	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.242 µg/L	95.4	70.0	130
EP231P: PFAS Sums (QCLot: 5393452)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5393886)							
EM2319124-122	TP6_0.0-0.2	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00111 mg/kg	86.3	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00118 mg/kg	96.7	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00114 mg/kg	87.4	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	99.2	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	82.0	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00121 mg/kg	73.2	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5394696)							
EM2319124-154	TP23_0.9-1.0	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00111 mg/kg	88.0	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00118 mg/kg	107	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00114 mg/kg	93.5	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	99.5	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	84.0	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00121 mg/kg	75.0	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5395024)							
EM2319124-189	TP10_0.5-0.6	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00111 mg/kg	87.5	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00118 mg/kg	93.4	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00114 mg/kg	95.4	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	97.7	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	70.1	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00121 mg/kg	62.4	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5398926)							
EM2319031-111	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00111 mg/kg	85.3	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00118 mg/kg	85.0	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00114 mg/kg	84.1	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	96.3	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	86.2	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00121 mg/kg	86.0	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5393886)							
EM2319124-122	TP6_0.0-0.2	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	87.2	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	86.7	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	90.2	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	88.0	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	95.7	69.0	133

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5393886) - continued							
EM2319124-122	TP6_0.0-0.2	EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	95.8	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	99.2	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	90.4	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	87.4	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	98.5	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	104	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5394696)							
EM2319124-154	TP23_0.9-1.0	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	86.5	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	84.1	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	99.7	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	89.2	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	98.7	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	94.9	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	101	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	93.4	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	89.9	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	93.9	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	101	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5395024)							
EM2319124-189	TP10_0.5-0.6	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	89.2	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	102	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	100	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	89.5	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	99.1	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	96.6	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	106	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	102	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	82.6	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	93.6	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	99.6	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5398926)							
EM2319031-111	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	84.3	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	97.8	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	99.6	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	88.7	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	92.0	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	89.7	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	93.4	69.0	133

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5398926) - continued							
EM2319031-111	Anonymous	EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	91.2	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	87.2	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	89.2	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	95.6	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5393886)							
EM2319124-122	TP6_0.0-0.2	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	87.5	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	81.9	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	90.1	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	94.8	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	95.8	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	80.8	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	86.4	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5394696)							
EM2319124-154	TP23_0.9-1.0	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	95.0	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	88.2	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	89.8	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	99.5	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	95.4	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	94.1	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	90.6	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5395024)							
EM2319124-189	TP10_0.5-0.6	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	89.6	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	80.5	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	88.1	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	100	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	101	70.0	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5395024) - continued							
EM2319124-189	TP10_0.5-0.6	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	82.6	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	93.0	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5398926)							
EM2319031-111	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	91.3	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	84.7	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	89.0	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	88.7	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	96.7	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	96.4	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	95.4	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5393886)							
EM2319124-122	TP6_0.0-0.2	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	99.0	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00119 mg/kg	91.7	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	98.8	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00121 mg/kg	74.4	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5394696)							
EM2319124-154	TP23_0.9-1.0	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	98.5	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00119 mg/kg	102	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	105	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00121 mg/kg	91.0	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5395024)							
EM2319124-189	TP10_0.5-0.6	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	94.9	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00119 mg/kg	90.0	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	99.0	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00121 mg/kg	70.9	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5398926)							
EM2319031-111	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	93.9	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00119 mg/kg	105	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	97.7	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00121 mg/kg	88.5	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM2319124**	Page	: 1 of 11
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: ANGUS ROBINSON	Telephone	: +61881625130
Project	: MFS ANGLE PARK DSI	Date Samples Received	: 26-Oct-2023
Site	: ----	Issue Date	: 02-Nov-2023
Sampler	: Terrence Wilson	No. of samples received	: 104
Order number	: ----	No. of samples analysed	: 62

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
	0				
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	15	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	15	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

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

Method / ***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) FD01, FD02, FD03	**23-Oct-2023**	**----**	----	----	**31-Oct-2023**	06-Nov-2023	✓
HDPE Soil Jar (EA055) TP22_0.0-0.2	**24-Oct-2023**	**----**	----	----	**01-Nov-2023**	07-Nov-2023	✓
HDPE Soil Jar (EA055)							

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) - Continued								
TP3_0.4-0.5,	TP6_0.0-0.2,	**24-Oct-2023**	**----**	----	**----**	**31-Oct-2023**	07-Nov-2023	✓
TP6_0.4-0.5,	TP6_0.9-1.0,							
TP5_0.0-0.2,	TP5_0.4-0.5,							
TP5_1.4-1.5,	TP8_0.0-0.2,							
TP8_0.4-0.5,	TP8_0.9-1.0,							
TP9_0.0-0.1,	TP9_0.4-0.5,							
TP9_0.9-1.0,	TP11_0.0-0.2,							
TP11_0.4-0.5,	TP11_0.9-1.0,							
TP14_0.0-0.2,	TP14_0.4-0.5,							
TP14_0.9-1.0,	TP23_0-0.2,							
TP23_0.3-0.4,	TP23_0.9-1.0,							
TP17_0.0-0.2,	TP17_0.9-1.0,							
TP17_1.9-2.0,	TP22_0.9-1.0,							
TP22_1.4-1.5,	TP15_0.0-0.2,							
TP15_0.6-0.7,	TP15_1.4-1.5,							
TP12_0.0-0.2,	TP12_0.6-0.7,							
TP12_1.9-2.0,	TP18_0.0-0.2,							
TP18_0.9-1.0,	TP18_1.4-1.5,							
TP10_0.0-0.2,	TP10_0.5-0.6,							
TP10_0.9-1.0,	TP4_0.0-0.2,							
TP4_0.9-1.0,	TP4_1.9-2.0,							
TP7_0.0-0.2,	TP7_1.4-1.5,							
TP7_1.9-2.0,	FD04,							
FD05,	QC1,							
QC2,	QC3							
HDPE Soil Jar (EA055)								
QC4		**25-Oct-2023**	**----**	----	**----**	**01-Nov-2023**	08-Nov-2023	✓
HDPE Soil Jar (EA055)								
TP16_0-0.1,	TP16_0.9-1.0,	**25-Oct-2023**	**----**	----	**----**	**31-Oct-2023**	08-Nov-2023	✓
TP16_1.9-2.0								

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X) FD01, FD02, FD03	**23-Oct-2023**	**31-Oct-2023**	20-Apr-2024	✓	**01-Nov-2023**	10-Dec-2023	✓
HDPE Soil Jar (EP231X) TP22_0.0-0.2	**24-Oct-2023**	**02-Nov-2023**	21-Apr-2024	✓	**02-Nov-2023**	12-Dec-2023	✓
HDPE Soil Jar (EP231X) TP3_0.4-0.5, TP6_0.0-0.2, TP6_0.4-0.5, TP6_0.9-1.0, TP5_0.0-0.2, TP5_0.4-0.5, TP5_1.4-1.5, TP8_0.0-0.2, TP8_0.4-0.5, TP8_0.9-1.0, TP9_0.0-0.1, TP9_0.4-0.5, TP9_0.9-1.0, TP11_0.0-0.2, TP11_0.4-0.5, TP11_0.9-1.0, TP14_0.0-0.2, TP14_0.4-0.5, TP14_0.9-1.0, TP23_0-0.2, TP23_0.3-0.4, TP23_0.9-1.0, TP17_0.0-0.2, TP17_0.9-1.0, TP17_1.9-2.0, TP22_0.9-1.0, TP22_1.4-1.5, TP15_0.0-0.2, TP15_0.6-0.7, TP15_1.4-1.5, TP12_0.0-0.2, TP12_0.6-0.7, TP12_1.9-2.0, TP18_0.0-0.2, TP18_0.9-1.0, TP18_1.4-1.5, TP10_0.0-0.2, TP10_0.5-0.6, TP10_0.9-1.0, TP4_0.0-0.2, TP4_0.9-1.0, TP4_1.9-2.0, TP7_0.0-0.2, TP7_1.4-1.5, TP7_1.9-2.0, FD04, FD05, QC1, QC2, QC3	**24-Oct-2023**	**31-Oct-2023**	21-Apr-2024	✓	**01-Nov-2023**	10-Dec-2023	✓
HDPE Soil Jar (EP231X) QC4	**25-Oct-2023**	**02-Nov-2023**	22-Apr-2024	✓	**02-Nov-2023**	12-Dec-2023	✓
HDPE Soil Jar (EP231X) TP16_0-0.1, TP16_0.9-1.0, TP16_1.9-2.0	**25-Oct-2023**	**31-Oct-2023**	22-Apr-2024	✓	**01-Nov-2023**	10-Dec-2023	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X) FD01, FD02, FD03	**23-Oct-2023**	**31-Oct-2023**	20-Apr-2024	✓	**01-Nov-2023**	10-Dec-2023	✓
HDPE Soil Jar (EP231X) TP22_0.0-0.2	**24-Oct-2023**	**02-Nov-2023**	21-Apr-2024	✓	**02-Nov-2023**	12-Dec-2023	✓
HDPE Soil Jar (EP231X) TP3_0.4-0.5, TP6_0.0-0.2, TP6_0.4-0.5, TP6_0.9-1.0, TP5_0.0-0.2, TP5_0.4-0.5, TP5_1.4-1.5, TP8_0.0-0.2, TP8_0.4-0.5, TP8_0.9-1.0, TP9_0.0-0.1, TP9_0.4-0.5, TP9_0.9-1.0, TP11_0.0-0.2, TP11_0.4-0.5, TP11_0.9-1.0, TP14_0.0-0.2, TP14_0.4-0.5, TP14_0.9-1.0, TP23_0-0.2, TP23_0.3-0.4, TP23_0.9-1.0, TP17_0.0-0.2, TP17_0.9-1.0, TP17_1.9-2.0, TP22_0.9-1.0, TP22_1.4-1.5, TP15_0.0-0.2, TP15_0.6-0.7, TP15_1.4-1.5, TP12_0.0-0.2, TP12_0.6-0.7, TP12_1.9-2.0, TP18_0.0-0.2, TP18_0.9-1.0, TP18_1.4-1.5, TP10_0.0-0.2, TP10_0.5-0.6, TP10_0.9-1.0, TP4_0.0-0.2, TP4_0.9-1.0, TP4_1.9-2.0, TP7_0.0-0.2, TP7_1.4-1.5, TP7_1.9-2.0, FD04, FD05, QC1, QC2, QC3	**24-Oct-2023**	**31-Oct-2023**	21-Apr-2024	✓	**01-Nov-2023**	10-Dec-2023	✓
HDPE Soil Jar (EP231X) QC4	**25-Oct-2023**	**02-Nov-2023**	22-Apr-2024	✓	**02-Nov-2023**	12-Dec-2023	✓
HDPE Soil Jar (EP231X) TP16_0-0.1, TP16_0.9-1.0, TP16_1.9-2.0	**25-Oct-2023**	**31-Oct-2023**	22-Apr-2024	✓	**01-Nov-2023**	10-Dec-2023	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X) FD01, FD02, FD03	**23-Oct-2023**	**31-Oct-2023**	20-Apr-2024	✓	**01-Nov-2023**	10-Dec-2023	✓
HDPE Soil Jar (EP231X) TP22_0.0-0.2	**24-Oct-2023**	**02-Nov-2023**	21-Apr-2024	✓	**02-Nov-2023**	12-Dec-2023	✓
HDPE Soil Jar (EP231X) TP3_0.4-0.5, TP6_0.0-0.2, TP6_0.4-0.5, TP6_0.9-1.0, TP5_0.0-0.2, TP5_0.4-0.5, TP5_1.4-1.5, TP8_0.0-0.2, TP8_0.4-0.5, TP8_0.9-1.0, TP9_0.0-0.1, TP9_0.4-0.5, TP9_0.9-1.0, TP11_0.0-0.2, TP11_0.4-0.5, TP11_0.9-1.0, TP14_0.0-0.2, TP14_0.4-0.5, TP14_0.9-1.0, TP23_0-0.2, TP23_0.3-0.4, TP23_0.9-1.0, TP17_0.0-0.2, TP17_0.9-1.0, TP17_1.9-2.0, TP22_0.9-1.0, TP22_1.4-1.5, TP15_0.0-0.2, TP15_0.6-0.7, TP15_1.4-1.5, TP12_0.0-0.2, TP12_0.6-0.7, TP12_1.9-2.0, TP18_0.0-0.2, TP18_0.9-1.0, TP18_1.4-1.5, TP10_0.0-0.2, TP10_0.5-0.6, TP10_0.9-1.0, TP4_0.0-0.2, TP4_0.9-1.0, TP4_1.9-2.0, TP7_0.0-0.2, TP7_1.4-1.5, TP7_1.9-2.0, FD04, FD05, QC1, QC2, QC3	**24-Oct-2023**	**31-Oct-2023**	21-Apr-2024	✓	**01-Nov-2023**	10-Dec-2023	✓
HDPE Soil Jar (EP231X) QC4	**25-Oct-2023**	**02-Nov-2023**	22-Apr-2024	✓	**02-Nov-2023**	12-Dec-2023	✓
HDPE Soil Jar (EP231X) TP16_0-0.1, TP16_0.9-1.0, TP16_1.9-2.0	**25-Oct-2023**	**31-Oct-2023**	22-Apr-2024	✓	**01-Nov-2023**	10-Dec-2023	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
FD01, FD02, FD03	**23-Oct-2023**	**31-Oct-2023**	20-Apr-2024	✓	**01-Nov-2023**	10-Dec-2023	✓
HDPE Soil Jar (EP231X)							
TP22_0.0-0.2	**24-Oct-2023**	**02-Nov-2023**	21-Apr-2024	✓	**02-Nov-2023**	12-Dec-2023	✓
HDPE Soil Jar (EP231X)							
TP3_0.4-0.5, TP6_0.0-0.2, TP6_0.4-0.5, TP6_0.9-1.0, TP5_0.0-0.2, TP5_0.4-0.5, TP5_1.4-1.5, TP8_0.0-0.2, TP8_0.4-0.5, TP8_0.9-1.0, TP9_0.0-0.1, TP9_0.4-0.5, TP9_0.9-1.0, TP11_0.0-0.2, TP11_0.4-0.5, TP11_0.9-1.0, TP14_0.0-0.2, TP14_0.4-0.5, TP14_0.9-1.0, TP23_0-0.2, TP23_0.3-0.4, TP23_0.9-1.0, TP17_0.0-0.2, TP17_0.9-1.0, TP17_1.9-2.0, TP22_0.9-1.0, TP22_1.4-1.5, TP15_0.0-0.2, TP15_0.6-0.7, TP15_1.4-1.5, TP12_0.0-0.2, TP12_0.6-0.7, TP12_1.9-2.0, TP18_0.0-0.2, TP18_0.9-1.0, TP18_1.4-1.5, TP10_0.0-0.2, TP10_0.5-0.6, TP10_0.9-1.0, TP4_0.0-0.2, TP4_0.9-1.0, TP4_1.9-2.0, TP7_0.0-0.2, TP7_1.4-1.5, TP7_1.9-2.0, FD04, FD05, QC1, QC2, QC3	**24-Oct-2023**	**31-Oct-2023**	21-Apr-2024	✓	**01-Nov-2023**	10-Dec-2023	✓
HDPE Soil Jar (EP231X)							
QC4	**25-Oct-2023**	**02-Nov-2023**	22-Apr-2024	✓	**02-Nov-2023**	12-Dec-2023	✓
HDPE Soil Jar (EP231X)							
TP16_0-0.1, TP16_0.9-1.0, TP16_1.9-2.0	**25-Oct-2023**	**31-Oct-2023**	22-Apr-2024	✓	**01-Nov-2023**	10-Dec-2023	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
FD01, FD02, FD03	**23-Oct-2023**	**31-Oct-2023**	20-Apr-2024	✓	**01-Nov-2023**	10-Dec-2023	✓
HDPE Soil Jar (EP231X)							
TP22_0.0-0.2	**24-Oct-2023**	**02-Nov-2023**	21-Apr-2024	✓	**02-Nov-2023**	12-Dec-2023	✓
HDPE Soil Jar (EP231X)							
TP3_0.4-0.5, TP6_0.0-0.2, TP6_0.4-0.5, TP6_0.9-1.0, TP5_0.0-0.2, TP5_0.4-0.5, TP5_1.4-1.5, TP8_0.0-0.2, TP8_0.4-0.5, TP8_0.9-1.0, TP9_0.0-0.1, TP9_0.4-0.5, TP9_0.9-1.0, TP11_0.0-0.2, TP11_0.4-0.5, TP11_0.9-1.0, TP14_0.0-0.2, TP14_0.4-0.5, TP14_0.9-1.0, TP23_0-0.2, TP23_0.3-0.4, TP23_0.9-1.0, TP17_0.0-0.2, TP17_0.9-1.0, TP17_1.9-2.0, TP22_0.9-1.0, TP22_1.4-1.5, TP15_0.0-0.2, TP15_0.6-0.7, TP15_1.4-1.5, TP12_0.0-0.2, TP12_0.6-0.7, TP12_1.9-2.0, TP18_0.0-0.2, TP18_0.9-1.0, TP18_1.4-1.5, TP10_0.0-0.2, TP10_0.5-0.6, TP10_0.9-1.0, TP4_0.0-0.2, TP4_0.9-1.0, TP4_1.9-2.0, TP7_0.0-0.2, TP7_1.4-1.5, TP7_1.9-2.0, FD04, FD05, QC1, QC2, QC3	**24-Oct-2023**	**31-Oct-2023**	21-Apr-2024	✓	**01-Nov-2023**	10-Dec-2023	✓
HDPE Soil Jar (EP231X)							
QC4	**25-Oct-2023**	**02-Nov-2023**	22-Apr-2024	✓	**02-Nov-2023**	12-Dec-2023	✓
HDPE Soil Jar (EP231X)							
TP16_0-0.1, TP16_0.9-1.0, TP16_1.9-2.0	**25-Oct-2023**	**31-Oct-2023**	22-Apr-2024	✓	**01-Nov-2023**	10-Dec-2023	✓

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation

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) RB01	**23-Oct-2023**	**31-Oct-2023**	20-Apr-2024	✓	**31-Oct-2023**	20-Apr-2024	✓
HDPE (no PTFE) (EP231X) RB02A, RB02B	**24-Oct-2023**	**31-Oct-2023**	21-Apr-2024	✓	**31-Oct-2023**	21-Apr-2024	✓
HDPE (no PTFE) (EP231X) RB03A	**25-Oct-2023**	**31-Oct-2023**	22-Apr-2024	✓	**31-Oct-2023**	22-Apr-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X) RB01	**23-Oct-2023**	**31-Oct-2023**	20-Apr-2024	✓	**31-Oct-2023**	20-Apr-2024	✓
HDPE (no PTFE) (EP231X) RB02A, RB02B	**24-Oct-2023**	**31-Oct-2023**	21-Apr-2024	✓	**31-Oct-2023**	21-Apr-2024	✓
HDPE (no PTFE) (EP231X) RB03A	**25-Oct-2023**	**31-Oct-2023**	22-Apr-2024	✓	**31-Oct-2023**	22-Apr-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) RB01	**23-Oct-2023**	**31-Oct-2023**	20-Apr-2024	✓	**31-Oct-2023**	20-Apr-2024	✓
HDPE (no PTFE) (EP231X) RB02A, RB02B	**24-Oct-2023**	**31-Oct-2023**	21-Apr-2024	✓	**31-Oct-2023**	21-Apr-2024	✓
HDPE (no PTFE) (EP231X) RB03A	**25-Oct-2023**	**31-Oct-2023**	22-Apr-2024	✓	**31-Oct-2023**	22-Apr-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) RB01	**23-Oct-2023**	**31-Oct-2023**	20-Apr-2024	✓	**31-Oct-2023**	20-Apr-2024	✓
HDPE (no PTFE) (EP231X) RB02A, RB02B	**24-Oct-2023**	**31-Oct-2023**	21-Apr-2024	✓	**31-Oct-2023**	21-Apr-2024	✓
HDPE (no PTFE) (EP231X) RB03A	**25-Oct-2023**	**31-Oct-2023**	22-Apr-2024	✓	**31-Oct-2023**	22-Apr-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) RB01	**23-Oct-2023**	**31-Oct-2023**	20-Apr-2024	✓	**31-Oct-2023**	20-Apr-2024	✓
HDPE (no PTFE) (EP231X) RB02A, RB02B	**24-Oct-2023**	**31-Oct-2023**	21-Apr-2024	✓	**31-Oct-2023**	21-Apr-2024	✓
HDPE (no PTFE) (EP231X) RB03A	**25-Oct-2023**	**31-Oct-2023**	22-Apr-2024	✓	**31-Oct-2023**	22-Apr-2024	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	7	58	**12.07**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	8	74	**10.81**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	74	**5.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	74	**5.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	74	**5.41**	**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		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	15	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	15	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

CERTIFICATE OF ANALYSIS

Work Order	: **EM2319124**	Page	: 1 of 29
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: ANGUS ROBINSON	Contact	: Kieren Burns
Address	: Level 4, 211 VICTORIA SQUARE ADELAIDE SA, AUSTRALIA 5000	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +61881625130
Project	: MFS ANGLE PARK DSI	Date Samples Received	: 26-Oct-2023 11:50
Order number	: ----	Date Analysis Commenced	: 31-Oct-2023
C-O-C number	: ----	Issue Date	: 02-Nov-2023 15:55
Sampler	: Terrence Wilson		
Site	: ----		
Quote number	: EM23GHDSER0022		
No. of samples received	: 104		
No. of samples analysed	: 62		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Xing Lin	Senior Organic Chemist	Melbourne Inorganics, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC

General Comments

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

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

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

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

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

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

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

- This is a split WO with EM2319031.
- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP3_0.4-0.5	TP6_0.0-0.2	TP6_0.4-0.5	TP6_0.9-1.0	TP5_0.0-0.2
			Sampling date / time	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00
Compound	CAS Number	LOR	Unit	EM2319124-121	EM2319124-122	EM2319124-123	EM2319124-124	EM2319124-127
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**6.3**	**2.8**	**10.7**	**14.0**	**7.4**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**0.0011**	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**0.0011**	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	**0.0031**	**0.0039**	**0.0007**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	**0.0018**	**0.0056**	<0.0002	**0.0062**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**0.0018**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	**0.0002**	**0.0015**	**0.0016**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**0.0012**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**0.0034**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**0.0014**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**0.0005**
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP3_0.4-0.5	TP6_0.0-0.2	TP6_0.4-0.5	TP6_0.9-1.0	TP5_0.0-0.2
			Sampling date / time	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00
Compound	CAS Number	LOR	Unit	EM2319124-121	EM2319124-122	EM2319124-123	EM2319124-124	EM2319124-127
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	**0.0006**
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	<0.0002	**0.0018**	**0.0089**	**0.0076**	**0.0174**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	**0.0018**	**0.0087**	**0.0039**	**0.0069**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	**0.0018**	**0.0089**	**0.0065**	**0.0149**
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	**118**	**106**	**106**	**114**	**120**
13C8-PFOA	----	0.0002	%	**93.8**	**107**	**108**	**101**	**93.8**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP5_0.4-0.5	TP5_1.4-1.5	TP8_0.0-0.2	TP8_0.4-0.5	TP8_0.9-1.0
			Sampling date / time	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00
Compound	CAS Number	LOR	Unit	EM2319124-128	EM2319124-130	EM2319124-132	EM2319124-133	EM2319124-134
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**24.4**	**23.5**	**4.2**	**6.3**	**13.1**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**0.0004**	**0.0008**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**0.0003**	**0.0012**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	**0.0004**	<0.0002	**0.0005**	**0.0033**	**0.0020**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	**0.0522**	**0.0015**	**0.0020**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	**0.0004**	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	**0.0010**	<0.0002	<0.0002	<0.0002	**0.0002**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	**0.0010**	<0.0002	<0.0002	**0.0008**	**0.0022**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**0.0002**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	**0.0004**	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP5_0.4-0.5	TP5_1.4-1.5	TP8_0.0-0.2	TP8_0.4-0.5	TP8_0.9-1.0
			Sampling date / time	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00
Compound	CAS Number	LOR	Unit	EM2319124-128	EM2319124-130	EM2319124-132	EM2319124-133	EM2319124-134
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	**0.0024**	<0.0002	**0.0531**	**0.0067**	**0.0086**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	**0.0004**	<0.0002	**0.0527**	**0.0048**	**0.0040**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	**0.0024**	<0.0002	**0.0527**	**0.0064**	**0.0074**
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	**81.2**	**112**	**129**	**119**	**118**
13C8-PFOA	----	0.0002	%	**99.5**	**86.8**	**91.8**	**90.2**	**93.8**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP9_0.0-0.1	TP9_0.4-0.5	TP9_0.9-1.0	TP11_0.0-0.2	TP11_0.4-0.5
			Sampling date / time	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00
Compound	CAS Number	LOR	Unit	EM2319124-137	EM2319124-138	EM2319124-139	EM2319124-142	EM2319124-143
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**7.7**	**20.6**	**15.2**	**4.7**	**20.2**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	**0.0021**	<0.0002	<0.0002	**0.0026**	**0.0243**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP9_0.0-0.1	TP9_0.4-0.5	TP9_0.9-1.0	TP11_0.0-0.2	TP11_0.4-0.5
				Sampling date / time	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00
Compound	CAS Number	LOR	Unit		EM2319124-137	EM2319124-138	EM2319124-139	EM2319124-142	EM2319124-143
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0021**	<0.0002	<0.0002	**0.0026**	**0.0243**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0021**	<0.0002	<0.0002	**0.0026**	**0.0243**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0021**	<0.0002	<0.0002	**0.0026**	**0.0243**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**110**	**111**	**119**	**110**	**99.2**
13C8-PFOA	----	0.0002	%		**93.0**	**95.0**	**112**	**92.0**	**104**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP11_0.9-1.0	TP14_0.0-0.2	TP14_0.4-0.5	TP14_0.9-1.0	TP23_0-0.2
				Sampling date / time	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00
Compound	CAS Number	LOR	Unit		EM2319124-144	EM2319124-147	EM2319124-148	EM2319124-149	EM2319124-152
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**6.0**	**2.6**	**6.6**	**16.1**	**4.0**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**0.0037**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**0.0020**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**0.0097**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**0.0004**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0030**	**0.0115**	<0.0002	<0.0002	**0.0163**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	**0.003**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**0.0084**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**0.0270**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**0.0022**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	**0.0003**	<0.0002	<0.0002	**0.0028**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	**0.0002**	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP11_0.9-1.0	TP14_0.0-0.2	TP14_0.4-0.5	TP14_0.9-1.0	TP23_0-0.2
			Sampling date / time	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00
Compound	CAS Number	LOR	Unit	EM2319124-144	EM2319124-147	EM2319124-148	EM2319124-149	EM2319124-152
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	**0.0030**	**0.0120**	<0.0002	<0.0002	**0.0755**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	**0.0030**	**0.0115**	<0.0002	<0.0002	**0.0260**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	**0.0030**	**0.0118**	<0.0002	<0.0002	**0.0731**
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	**115**	**107**	**116**	**101**	**98.0**
13C8-PFOA	----	0.0002	%	**97.8**	**97.5**	**104**	**105**	**94.5**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP23_0.3-0.4	TP23_0.9-1.0	TP16_0-0.1	TP16_0.9-1.0	TP16_1.9-2.0
				Sampling date / time	24-Oct-2023 00:00	24-Oct-2023 00:00	25-Oct-2023 00:00	25-Oct-2023 00:00	25-Oct-2023 00:00
Compound	CAS Number	LOR	Unit		EM2319124-153	EM2319124-154	EM2319124-157	EM2319124-160	EM2319124-162
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**14.7**	**21.4**	**5.4**	**20.7**	**15.3**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		**0.0007**	<0.0002	**0.0219**	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	**0.0259**	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		**0.0002**	<0.0002	**0.0361**	<0.0002	**0.0009**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	**0.0014**	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	**0.0198**	<0.0002	**0.0012**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	**0.004**	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		**0.0008**	<0.0002	**0.0140**	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		**0.0034**	**0.0008**	**0.0633**	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		**0.0004**	<0.0002	**0.0068**	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	**0.0012**	<0.0002	**0.0002**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP23_0.3-0.4	TP23_0.9-1.0	TP16_0-0.1	TP16_0.9-1.0	TP16_1.9-2.0
			Sampling date / time	24-Oct-2023 00:00	24-Oct-2023 00:00	25-Oct-2023 00:00	25-Oct-2023 00:00	25-Oct-2023 00:00
Compound	CAS Number	LOR	Unit	EM2319124-153	EM2319124-154	EM2319124-157	EM2319124-160	EM2319124-162
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	**0.0055**	**0.0008**	**0.194**	<0.0002	**0.0023**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	**0.0002**	<0.0002	**0.0559**	<0.0002	**0.0021**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	**0.0055**	**0.0008**	**0.167**	<0.0002	**0.0023**
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	**112**	**92.0**	**127**	**80.4**	**134**
13C8-PFOA	----	0.0002	%	**95.0**	**97.3**	**107**	**101**	**93.2**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP17_0.0-0.2	TP17_0.9-1.0	TP17_1.9-2.0	TP22_0.9-1.0	TP22_1.4-1.5
				Sampling date / time	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00
Compound	CAS Number	LOR	Unit		EM2319124-163	EM2319124-165	EM2319124-167	EM2319124-168	EM2319124-170
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**5.9**	**17.2**	**16.5**	**19.5**	**19.4**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		**0.0007**	<0.0002	<0.0002	**0.0018**	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0459**	<0.0002	<0.0002	**0.0081**	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	**0.0003**	<0.0002	**0.0027**	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	**0.0010**	<0.0002	**0.0018**	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		**0.0003**	<0.0002	<0.0002	**0.0003**	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		**0.0008**	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		**0.0005**	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP17_0.0-0.2	TP17_0.9-1.0	TP17_1.9-2.0	TP22_0.9-1.0	TP22_1.4-1.5
			Sampling date / time	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00
Compound	CAS Number	LOR	Unit	EM2319124-163	EM2319124-165	EM2319124-167	EM2319124-168	EM2319124-170
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	**0.0482**	**0.0013**	<0.0002	**0.0147**	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	**0.0466**	<0.0002	<0.0002	**0.0099**	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	**0.0469**	**0.0013**	<0.0002	**0.0147**	<0.0002
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	**126**	**88.6**	**116**	**123**	**130**
13C8-PFOA	----	0.0002	%	**96.8**	**96.8**	**102**	**98.0**	**104**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP15_0.0-0.2	TP15_0.6-0.7	TP15_1.4-1.5	TP12_0.0-0.2	TP12_0.6-0.7
			Sampling date / time	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00
Compound	CAS Number	LOR	Unit	EM2319124-172	EM2319124-173	EM2319124-175	EM2319124-177	EM2319124-178
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**5.3**	**19.7**	**18.0**	**5.2**	**14.7**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	**0.0004**	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	**0.0006**	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP15_0.0-0.2	TP15_0.6-0.7	TP15_1.4-1.5	TP12_0.0-0.2	TP12_0.6-0.7
			Sampling date / time	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00
Compound	CAS Number	LOR	Unit	EM2319124-172	EM2319124-173	EM2319124-175	EM2319124-177	EM2319124-178
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	**0.0010**	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	**0.0010**	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	**0.0010**	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	**131**	**125**	**116**	**93.4**	**134**
13C8-PFOA	----	0.0002	%	**100**	**102**	**100**	**99.9**	**94.8**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP12_1.9-2.0	TP18_0.0-0.2	TP18_0.9-1.0	TP18_1.4-1.5	TP10_0.0-0.2
				Sampling date / time	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00
Compound	CAS Number	LOR	Unit		EM2319124-181	EM2319124-182	EM2319124-183	EM2319124-185	EM2319124-187
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**16.7**	**2.2**	**12.6**	**19.4**	**2.5**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	**0.0004**	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	**0.0009**	<0.0002	<0.0002	**0.0031**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	**0.0005**	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	**0.0009**	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	**0.0002**	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**0.0002**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**0.0002**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP12_1.9-2.0	TP18_0.0-0.2	TP18_0.9-1.0	TP18_1.4-1.5	TP10_0.0-0.2
			Sampling date / time	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00
Compound	CAS Number	LOR	Unit	EM2319124-181	EM2319124-182	EM2319124-183	EM2319124-185	EM2319124-187
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	**0.0019**	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	<0.0002	**0.0048**	<0.0002	<0.0002	**0.0035**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	**0.0013**	<0.0002	<0.0002	**0.0031**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	**0.0048**	<0.0002	<0.0002	**0.0033**
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	**128**	**132**	**112**	**120**	**85.5**
13C8-PFOA	----	0.0002	%	**93.2**	**96.5**	**90.0**	**97.0**	**99.5**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP10_0.5-0.6	TP10_0.9-1.0	TP4_0.0-0.2	TP4_0.9-1.0	TP4_1.9-2.0
				Sampling date / time	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00
Compound	CAS Number	LOR	Unit		EM2319124-189	EM2319124-190	EM2319124-193	EM2319124-195	EM2319124-197
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**15.1**	**9.9**	**4.6**	**15.5**	**19.4**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0007**	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0007**	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		**0.0004**	<0.0002	**0.0019**	**0.0031**	**0.0005**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	**0.0007**	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	**0.103**	**0.0004**	**0.0006**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	**0.0002**	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		**0.0005**	<0.0002	**0.0003**	**0.0011**	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		**0.0008**	<0.0002	**0.0003**	**0.0013**	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0002**	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	**0.0005**	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	**0.0010**	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	**0.0003**	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP10_0.5-0.6	TP10_0.9-1.0	TP4_0.0-0.2	TP4_0.9-1.0	TP4_1.9-2.0
			Sampling date / time	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00
Compound	CAS Number	LOR	Unit	EM2319124-189	EM2319124-190	EM2319124-193	EM2319124-195	EM2319124-197
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	**0.0017**	<0.0002	**0.108**	**0.0075**	**0.0011**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	**0.0004**	<0.0002	**0.105**	**0.0035**	**0.0011**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	**0.0017**	<0.0002	**0.106**	**0.0068**	**0.0011**
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	**85.8**	**91.9**	**84.0**	**89.8**	**86.6**
13C8-PFOA	----	0.0002	%	**98.8**	**104**	**100**	**99.9**	**101**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	TP7_0.0-0.2	TP7_1.4-1.5	TP7_1.9-2.0	FD01	FD02
				Sampling date / time	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	23-Oct-2023 00:00	23-Oct-2023 00:00
Compound	CAS Number	LOR	Unit		EM2319124-198	EM2319124-201	EM2319124-202	EM2319124-203	EM2319124-204
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		3.8	16.6	18.8	4.0	4.3
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	0.0024	0.0006	0.0009	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	0.0032	0.0003	0.0012	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		0.0010	0.0050	0.0006	0.0070	0.0005
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	0.0006	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		0.0128	<0.0002	0.0005	0.0168	0.0144
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		0.0003	0.0026	<0.0002	0.0009	0.0005
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		0.0004	0.0071	0.0002	0.0028	0.0004
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		0.0002	0.0006	<0.0002	0.0004	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		0.0004	<0.0002	<0.0002	0.0005	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		0.0004	<0.0002	<0.0002	<0.0002	0.0003
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		0.0007	<0.0002	<0.0002	<0.0002	0.0016
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		0.0003	<0.0002	<0.0002	<0.0002	0.0006
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		0.0003	<0.0002	<0.0002	<0.0002	0.0008
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	0.0004
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		0.0005	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	TP7_0.0-0.2	TP7_1.4-1.5	TP7_1.9-2.0	FD01	FD02
			Sampling date / time	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	23-Oct-2023 00:00	23-Oct-2023 00:00
Compound	CAS Number	LOR	Unit	EM2319124-198	EM2319124-201	EM2319124-202	EM2319124-203	EM2319124-204
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	**0.0069**	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	**0.0027**	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	**0.0175**	**0.0219**	**0.0022**	**0.0407**	**0.0195**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	**0.0138**	**0.0050**	**0.0011**	**0.0238**	**0.0149**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	**0.0151**	**0.0187**	**0.0019**	**0.0389**	**0.0158**
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	**93.3**	**89.0**	**86.8**	**96.6**	**88.3**
13C8-PFOA	----	0.0002	%	**98.8**	**100**	**98.4**	**98.4**	**96.3**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FD03	FD04	FD05	QC1	QC2
				Sampling date / time	23-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00
Compound	CAS Number	LOR	Unit		EM2319124-205	EM2319124-212	EM2319124-213	EM2319124-214	EM2319124-215
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**6.2**	**11.7**	**6.8**	**4.7**	**20.2**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		**0.0003**	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		**0.0056**	<0.0002	**0.0042**	**0.0024**	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		**0.0006**	<0.0002	<0.0002	**0.0009**	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0127**	<0.0002	**0.0018**	**0.135**	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0003**	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		**0.0002**	<0.0002	<0.0002	**0.0004**	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		**0.0006**	<0.0002	**0.0007**	**0.0004**	**0.0008**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	**0.0004**	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		**0.0004**	<0.0002	**0.0040**	**0.0007**	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0009**	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0003**	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FD03	FD04	FD05	QC1	QC2
				Sampling date / time	23-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00	24-Oct-2023 00:00
Compound	CAS Number	LOR	Unit		EM2319124-205	EM2319124-212	EM2319124-213	EM2319124-214	EM2319124-215
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0207**	<0.0002	**0.0111**	**0.141**	**0.0008**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0183**	<0.0002	**0.0060**	**0.137**	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0198**	<0.0002	**0.0111**	**0.139**	**0.0008**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**86.2**	**77.4**	**84.3**	**82.3**	**107**
13C8-PFOA	----	0.0002	%		**101**	**101**	**101**	**100.0**	**105**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	QC3	TP22_0.0-0.2	QC4	----	----
				Sampling date / time	24-Oct-2023 00:00	24-Oct-2023 00:00	25-Oct-2023 00:00	----	----
Compound	CAS Number	LOR	Unit		EM2319124-216	EM2319124-226	EM2319124-227	--------	--------
					Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**15.4**	**2.3**	**15.6**	**----**	**----**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	**0.0027**	<0.0002	**----**	**----**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	**0.0007**	<0.0002	**----**	**----**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	**0.0023**	**0.0005**	**----**	**----**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	**0.0006**	<0.0002	**----**	**----**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	**0.0550**	**0.0006**	**----**	**----**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	**0.0009**	<0.0002	**----**	**----**
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	**0.002**	<0.001	**----**	**----**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	**0.0036**	<0.0002	**----**	**----**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	**0.0082**	<0.0002	**----**	**----**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	**0.0004**	<0.0002	**----**	**----**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	**----**	**----**
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	**0.0011**	<0.0002	**----**	**----**
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	**----**	**----**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	QC3	TP22_0.0-0.2	QC4	----	----
			Sampling date / time	24-Oct-2023 00:00	24-Oct-2023 00:00	25-Oct-2023 00:00	----	----
Compound	CAS Number	LOR	Unit	EM2319124-216	EM2319124-226	EM2319124-227	--------	--------
				Result	Result	Result	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	----	----
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	<0.0002	**0.0775**	**0.0011**	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	**0.0573**	**0.0011**	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	**0.0742**	**0.0011**	----	----
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	**88.2**	**103**	**97.2**	----	----
13C8-PFOA	----	0.0002	%	**100**	**93.2**	**99.8**	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RB01	RB02A	RB03A	RB02B	----
				Sampling date / time	23-Oct-2023 00:00	24-Oct-2023 00:00	25-Oct-2023 00:00	24-Oct-2023 00:00	----
Compound	CAS Number	LOR	Unit		EM2319124-207	EM2319124-209	EM2319124-211	EM2319124-218	--------
					Result	Result	Result	Result	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	RB01	RB02A	RB03A	RB02B	----
				Sampling date / time	23-Oct-2023 00:00	24-Oct-2023 00:00	25-Oct-2023 00:00	24-Oct-2023 00:00	----
Compound	CAS Number	LOR	Unit		EM2319124-207	EM2319124-209	EM2319124-211	EM2319124-218	--------
					Result	Result	Result	Result	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**129**	**122**	**125**	**120**	----
13C8-PFOA	----	0.02	%		**99.8**	**103**	**102**	**101**	----

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	68	136
13C8-PFOA	----	69	133

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

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ **Sydney**: 277 Woodpark Rd, Smithfield NSW 2176 Ph: 02 8784 8555 E:samples.sydney@alsenviro.com
☐ **Newcastle**: 5 Rosegum Rd, Warabrook NSW 2304 Ph:02 4968 9433 E:samples.newcastle@alsenviro.com
☐ **Brisbane**: 32 Shand St, Stafford QLD 4053 Ph:07 3243 7222 E:samples.brisbane@alsenviro.com
☐ **Townsville**: 14-15 Desma Ct, Bohle QLD 4818 Ph:07 4796 0600 E: townsville.environmental@alsenviro.com
☐ **Melbourne**: 2-4 Westall Rd, Springvale VIC 3171 Ph:03 8549 9600 E: samples.melbourne@alsenviro.com
☐ **Adelaide**: 2-1 Burma Rd, Pooraka SA 5095 Ph: 08 8359 0890 E:adelaide@alsenviro.com
☐ **Perth**: 10 Hod Way, Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com
☐ **Launceston**: 27 Wellington St, Launceston TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT: GHD	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☐ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: Adelaide		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
PROJECT: (261 0808	ALS QUOTE NO.:	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER:		COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: 19.3 °C
PROJECT MANAGER: Angus Robinson	CONTACT PH:	OF: 1 2 3 4 5 6 7	Other comment:
SAMPLER:	SAMPLER MOBILE:	RELINQUISHED BY:	RECEIVED BY:
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	DATE/TIME:	DATE/TIME: 25.10.23 C1400
Email Reports to:			RELINQUISHED BY:
Email Invoice to:			DATE/TIME: 25-10-23 @ 1520
			RECEIVED BY:
			DATE/TIME: 26/10 12:20

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).	Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	ON HOLD	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
	18 Soil						
	TP + MW						
	2 Waters						
				TOTAL			

Environmental Division
Melbourne
Work Order Reference
EM2319124

Telephone : - 61-3-8549 9600

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

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ **Sydney**: 277 Woodpark Rd, Smithfield NSW 2176 Ph: 02 8784 8555 E:samples.sydney@alsenviro.com
☐ **Newcastle:** 5 Rosegum Rd, Warabrook NSW 2304 Ph:02 4968 9433 E:samples.newcastle@alsenviro.com
☐ **Brisbane**: 32 Shand St, Stafford QLD 4053 Ph:07 3243 7222 E:samples.brisbane@alsenviro.com
☐ **Townsville:** 14-15 Desma Ct, Bohle QLD 4818 Ph:07 4796 0600 E: townsville.environmental@alsenviro.com
☐ **Melbourne**: 2-4 Westall Rd, Springvale VIC 3171 Ph:03 8549 9600 E: samples.melbourne@alsenviro.com
☐ **Adelaide:** 2-1 Burma Rd, Pooraka SA 5095 Ph: 08 8359 0890 E:adelaide@alsenviro.com
☐ **Perth:** 10 Hod Way, Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com
☐ **Launceston:** 27 Wellington St, Launceston TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

HEIGHT

CLIENT: GHD	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)	☐ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: Adelaide (08) 8161 0808		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
PROJECT:	ALS QUOTE NO.:	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER:			Random Sample Temperature on Receipt: 19.7 °C
PROJECT MANAGER: ANGUS Robinson	CONTACT PH:		Other comment:
SAMPLER:	SAMPLER MOBILE:	RELINQUISHED BY:	RECEIVED BY:
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	DATE/TIME:	DATE/TIME: 25-10-23 C1400
Email Reports to:			RELINQUISHED BY:
Email Invoice to:			DATE/TIME: 25-10-23 @ 1520
			RECEIVED BY:
			DATE/TIME: 26/10 12:20

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).	Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	HOLD	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
	18 Soil						
	TP ≠ MW						
	2 Waters						
				TOTAL			

Environmental Division
Melbourne
Work Order Reference
EM2319124

Telephone : +61-3-8549 9600

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

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: GHD	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☒ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: Adelaide		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
	ALS QUOTE:	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT: MFS ANGLE PARK DSI	ORDER NO.: 12616808	COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Angus Robinson	CONTACT PH: 0431 177 498	OF: 1 2 3 4 5 6 7	Other comment:

SAMPLER: TW (Terrence Wilson)	SAMPLER MOBILE: 0467 034 756	RELINQUISHED BY:	RECEIVED BY:
COC emailed to ALS? YES	EDD FORMAT (or default): Esdat	*Terrence Wilson*	*Kieren Burns*
Email Reports to: Angus.Robinson@ghd.com; Terrence.Wilson@ghd.com; Ben.Pettlcrew@ghd.com; GHDLabReports@ghd.com		DATE/TIME: 24 October 2023; 15:00	DATE/TIME: 24 October 2023; 15:00
Email Invoice to: Angus.Robinson@ghd.com; accountspayableAU@ghd.com		RELINQUISHED BY:	RECEIVED BY:
		DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	PFAS (Long Suite) - Standard LOR	HOLD							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
121	TP3_0.4-0.5	24/10/2023	S	P	1	X								
122	TP6_0.0-0.2	24/10/2023	S	P	1	X								
123	TP6_0.4-0.5	24/10/2023	S	P	1	X								
124	TP6_0.9-1.0	24/10/2023	S	P	1	X								
125	TP6_1.4-1.5	24/10/2023	S	P	1		X							
126	TP6_1.9-2.0	24/10/2023	S	P	1		X							
127	TP5_0.0-0.2	24/10/2023	S	P	1	X								
128	TP5_0.4-0.5	24/10/2023	S	P	1	X								
129	TP5_0.9-1.0	24/10/2023	S	P	1		X							
130	TP5_1.4-1.5	24/10/2023	S	P	1	X								
131	TP5_1.9-2.0	24/10/2023	S	P	1		X							
132	TP8_0.0-0.2	24/10/2023	S	P	1	X								
				TOTAL	12	8	4							

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

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: GHD	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☒ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: Adelaide		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
	ALS QUOTE:	COC SEQUENCE NUMBER (Circle)	Free Ice / frozen Ice bricks present upon receipt? Yes No N/A
PROJECT: MFS ANGLE PARK DSI	ORDER NO.: 12616808	COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Angus Robinson	CONTACT PH: 0431 177 498	OF: 1 2 3 4 5 6 7	Other comment:

SAMPLER: TW (Terrence Wilson)	SAMPLER MOBILE: 0467 034 756	RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
COC emailed to ALS? YES	EDD FORMAT (or default): Esdat	*Terrence Wilson*	*Kieren Burns*		
Email Reports to: Angus.Robinson@ghd.com; Terrence.Wilson@ghd.com; Ben.Pettlcrew@ghd.com; GHDLabReports@ghd.com		DATE/TIME: 24 October 2023; 15:00	DATE/TIME: 24 October 2023; 15:00	DATE/TIME:	DATE/TIME:
Email Invoice to: Angus.Robinson@ghd.com; accountspayableAU@ghd.com					

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	PFAS (Long Suite) - Standard LOR	HOLD							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
133	TP8_0.4-0.5	24/10/2023	S	P	1	X								
134	TP8_0.9-1.0	24/10/2023	S	P	1	X								
135	TP8_1.4-1.5	24/10/2023	S	P	1		X							
136	TP8_1.9-2.0	24/10/2023	S	P	1		X							
137	TP9_0.0-0.1	24/10/2023	S	P	1	X								
138	TP9_0.4-0.5	24/10/2023	S	P	1	X								
139	TP9_0.9-1.0	24/10/2023	S	P	1	X								
140	TP9_1.4-1.5	24/10/2023	S	P	1		X							
141	TP9_1.9-2.0	24/10/2023	S	P	1		X							
142	TP11_0.0-0.2	24/10/2023	S	P	1	X								
143	TP11_0.4-0.5	24/10/2023	S	P	1	X								
144	TP11_0.9-1.0	24/10/2023	S	P	1	X								
				TOTAL	12	8	4							

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

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: GHD	TURNAROUND REQUIREMENTS : ☒ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: Adelaide	(Standard TAT may be longer for some tests e.g. Ultra Trace Organics) ☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
	ALS QUOTE:	COC SEQUENCE NUMBER (Circle)
PROJECT: MFS ANGLE PARK DSI	ORDER NO.: 12616808	COC: 1 2 3 4 5 6 7
PROJECT MANAGER: Angus Robinson	CONTACT PH: 0431 177 498	OF: 1 2 3 4 5 6 7
SAMPLER: TW (Terrence Wilson)	SAMPLER MOBILE: 0467 034 756	Free ice / frozen ice bricks present upon receipt? Yes No N/A
COC emailed to ALS? YES	EDD FORMAT (or default): Esdat	Random Sample Temperature on Receipt: °C
Email Reports to: Angus.Robinson@ghd.com; Terrence.Wilson@ghd.com; Ben.Petticrew@ghd.com; GHDLabReports@ghd.com		Other comment:
Email Invoice to: Angus.Robinson@ghd.com; accountspayableAU@ghd.com		

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Terrence Wilson	*Kieren Burns*		
DATE/TIME: 24 October 2023; 15:00	DATE/TIME: 24 October 2023; 15:00	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	PFAS (Long Suite) - Standard LOR	HOLD							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
145	TP11_1.4-1.5	24/10/2023	S	P	1		X							
146	TP11_1.9-2.0	24/10/2023	S	P	1		X							
147	TP14_0.0-0.2	24/10/2023	S	P	1	X								
148	TP14_0.4-0.5	24/10/2023	S	P	1	X								
149	TP14_0.9-1.0	24/10/2023	S	P	1	X								
150	TP14_1.5-1.6	24/10/2023	S	P	1		X							
151	TP14_1.9-2.0	24/10/2023	S	P	1		X							
152	TP23_0-0.2	24/10/2023	S	P	1	X								
153	TP23_0.3-0.4	24/10/2023	S	P	1	X								
154	TP23_0.9-1.0	24/10/2023	S	P	1	X								
155	TP23_1.4-1.5	24/10/2023	S	P	1		X							
156	TP23_1.9-2.0	24/10/2023	S	P	1		X							
				TOTAL	12	6	6							

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

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: GHD	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	☒ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: Adelaide		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
	ALS QUOTE:	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT: MFS ANGLE PARK DSI	ORDER NO.: 12616808	COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Angus Robinson	CONTACT PH: 0431 177 498	OF: 1 2 3 4 5 6 7	Other comment:
SAMPLER: TW (Terrence Wilson)	SAMPLER MOBILE: 0467 034 756	RELINQUISHED BY:	RECEIVED BY:
COC emailed to ALS? YES	EDD FORMAT (or default): Esdat	*Terrence Wilson*	*Kieren Burns*
Email Reports to: Angus.Robinson@ghd.com; Terrence.Wilson@ghd.com; Ben.Petticrew@ghd.com; GHDLabReports@ghd.com		DATE/TIME: 24 October 2023; 15:00	DATE/TIME: 24 October 2023; 15:00
Email Invoice to: Angus.Robinson@ghd.com; accountspayableAU@ghd.com		RELINQUISHED BY: DATE/TIME:	RECEIVED BY: DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	PFAS (Long Suite) - Standard LOR	HOLD							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
157	TP16_0-0.1	25/10/2023	S	P	1	X								
158	TP16_0.2-0.3	25/10/2023	S	P	1		X							
159	TP16_0.4-0.5	25/10/2023	S	P	1		X							
160	TP16_0.9-1.0	25/10/2023	S	P	1	X								
161	TP16_1.4-1.5	25/10/2023	S	P	1		X							
162	TP16_1.9-2.0	25/10/2023	S	P	1	X								
163	TP17_0.0-0.2	24/10/2023	S	P	1	X								
164	TP17_0.4-0.5	24/10/2023	S	P	1		X							
165	TP17_0.9-1.0	24/10/2023	S	P	1	X								
166	TP17_1.4-1.5	24/10/2023	S	P	1		X							
167	TP17_1.9-2.0	24/10/2023	S	P	1	X								
168	TP22_0.9-1.0	24/10/2023	S	P	1	X								
				TOTAL	12	7	5							

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

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: GHD	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☒ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: Adelaide		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
	ALS QUOTE:	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT: MFS ANGLE PARK DSI	ORDER NO.: 12616808	COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Angus Robinson	CONTACT PH: 0431 177 498	OF: 1 2 3 4 5 6 7	Other comment:
SAMPLER: TW (Terrence Wilson)	SAMPLER MOBILE: 0467 034 756	RELINQUISHED BY:	RECEIVED BY:
COC emailed to ALS? YES	EDD FORMAT (or default): Esdat	*Terrence Wilson*	*Kieren Burns*
Email Reports to: Angus.Robinson@ghd.com; Terrence.Wilson@ghd.com; Ben.Petticrew@ghd.com; GHDLabReports@ghd.com		DATE/TIME: 24 October 2023; 15:00	DATE/TIME: 24 October 2023; 15:00
Email Invoice to: Angus.Robinson@ghd.com; accountspayableAU@ghd.com		RELINQUISHED BY: DATE/TIME:	RECEIVED BY: DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	PFAS (Long Suite) - Standard LOR	HOLD							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
169	TP22_1.1-1.2	24/10/2023	S	P	1		X							
170	TP22_1.4-1.5	24/10/2023	S	P	1	X								
171	TP22_1.9-2.0	24/10/2023	S	P	1		X							
172	TP15_0.0-0.2	24/10/2023	S	P	1	X								
173	TP15_0.6-0.7	24/10/2023	S	P	1	X								
174	TP15_0.9-1.0	24/10/2023	S	P	1		X							
175	TP15_1.4-1.5	24/10/2023	S	P	1	X								
176	TP15_1.9-2.0	24/10/2023	S	P	1		X							
177	TP12_0.0-0.2	24/10/2023	S	P	1	X								
178	TP12_0.6-0.7	24/10/2023	S	P	1	X								
179	TP12_0.9-1.0	24/10/2023	S	P	1		X							
180	TP12_1.4-1.5	24/10/2023	S	P	1		X							
				TOTAL	12	6	6							

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

CHAIN OF CUSTODY

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CLIENT: GHD	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	☒ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: Adelaide		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
	ALS QUOTE:	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT: MFS ANGLE PARK DSI	ORDER NO.: 12616808	COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Angus Robinson	CONTACT PH: 0431 177 498	OF: 1 2 3 4 5 6 7	Other comment:
SAMPLER: TW (Terrence Wilson)	SAMPLER MOBILE: 0467 034 756	RELINQUISHED BY:	RECEIVED BY:
COC emailed to ALS? YES	EDD FORMAT (or default): Esdat	*Terrence Wilson*	*Kieren Burns*
Email Reports to: Angus.Robinson@ghd.com; Terrence.Wilson@ghd.com; Ben.Petticrew@ghd.com; GHDLabReports@ghd.com		DATE/TIME: 24 October 2023; 15:00	DATE/TIME: 24 October 2023; 15:00
Email Invoice to: Angus.Robinson@ghd.com; accountspayableAU@ghd.com		RELINQUISHED BY: DATE/TIME:	RECEIVED BY: DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	PFAS (Long Suite) - Standard LOR	HOLD							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
181	TP12_1.9-2.0	24/10/2023	S	P	1	X								
182	TP18_0.0-0.2	24/10/2023	S	P	1	X								
183	TP18_0.9-1.0	24/10/2023	S	P	1	X								
184	TP18_1.2-1.3	24/10/2023	S	P	1		X							
185	TP18_1.4-1.5	24/10/2023	S	P	1	X								
186	TP18_1.9-2.0	24/10/2023	S	P	1		X							
187	TP10_0.0-0.2	24/10/2023	S	P	1	X								
188	TP10_0.3-0.4	24/10/2023	S	P	1		X							
189	TP10_0.5-0.6	24/10/2023	S	P	1	X								
190	TP10_0.9-1.0	24/10/2023	S	P	1	X								
191	TP10_1.4-1.5	24/10/2023	S	P	1		X							
192	TP10_1.9-2.0	24/10/2023	S	P	1		X							
				TOTAL	12	7	5							

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

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: GHD	TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☒ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: Adelaide		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
	ALS QUOTE:	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT: MFS ANGLE PARK DSI	ORDER NO.: 12616808	COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Angus Robinson	CONTACT PH: 0431 177 498	OF: 1 2 3 4 5 6 7	Other comment:

SAMPLER: TW (Terrence Wilson)	SAMPLER MOBILE: 0467 034 756	RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY: / RECEIVED BY:
COC emailed to ALS? YES	EDD FORMAT (or default): Esdat	*Terrence Wilson*	*Kieren Burns*	
Email Reports to: Angus.Robinson@ghd.com; Terrence.Wilson@ghd.com; Ben.Petticrew@ghd.com; GHDLabReports@ghd.com		DATE/TIME: 24 October 2023; 15:00	DATE/TIME: 24 October 2023; 15:00	DATE/TIME: / DATE/TIME:
Email Invoice to: Angus.Robinson@ghd.com; accountspayableAU@ghd.com				

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	PFAS (Long Suite) - Standard LOR	HOLD							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
193	TP4_0.0-0.2	24/10/2023	S	P	1	X								
194	TP4_0.4-0.5	24/10/2023	S	P	1		X							
195	TP4_0.9-1.0	24/10/2023	S	P	1	X								
196	TP4_1.4-1.5	24/10/2023	S	P	1		X							
197	TP4_1.9-2.0	24/10/2023	S	P	1	X								
198	TP7_0.0-0.2	24/10/2023	S	P	1	X								
199	TP7_0.4-0.5	24/10/2023	S	P	1		X							
200	TP7_0.9-1.0	24/10/2023	S	P	1		X							
201	TP7_1.4-1.5	24/10/2023	S	P	1	X								
202	TP7_1.9-2.0	24/10/2023	S	P	1	X								
				TOTAL	10	6	4							

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

WORKORDER NO: EM

SAMPLE RECEIPT INFORMATION & BOTTLE MAP

To be completed by Sample Login Clerk

WO Log in Details	DATE/TIME	INITIAL
Sorting Commenced:		
Prelogged:		
Logged:		
Time placed in fridge:		
Total Time:		

TURNAROUND APPROVED FOR:
24Hrs 48Hrs 3Days 4Days Std

Approved By: _____

Miscellaneous Bottle(s):
Plastic Tin Glass

Specify Preservative: _____
Specify Volume: _____ mL
ALS Colour: _____

F on lid for Red/Green bottle(s):	YES
Sampling date not on sample(s):	YES
Non-ALS Container? (to be highlighted on bottle map)	YES
Soil bags frozen on receipt:	YES
Samples located in contamination box (please list samples)	YES
PO Number Requested:	YES
Temperature Sent:	YES

Receipt Conditions		Packaging		Carrier Details	
Cooler Temp	9.6 °C	Foam Esky		Company:	TNT / AaE / TOLL
Chilling Process	**Cooler Seal**	Hard Esky	S		TasFast AusPost
Ice In Bag / Frozen / Melted	Intact	By Hand		Client delivery	
Ice Bricks: Frozen / Thawed	Broken	Box / Bag		Courier	
Not Chilled	None	Con-note Number:	3ZIZ500004788		

Work Order Creation BP ONLY Completed		Committal BP ONLY Completed	
DATE	TIME	DATE	TIME
INITIALS		INITIALS	

Sample Receipt - To be Completed by Front End Staff

Temperature:
Reading 1 8.9 10.0
Reading 2 10.6
Reading 3 9.1

Samples placed in the freezer

	Yes	No	N/A
Acid Sulfate bags placed in the freezer			☑
Ultra Trace Nutrient Bottles	☐	☐	☑

Freezer Number _____

AECOM samples placed in the coolroom	☐	☐	☑

Completed by: _____

Colour [redacted]
Number

Any Advice Comments
*All Client communication to be recorded on the COC and copied to LIMS

Supervisor signed off: _____

Sample Receipt Checklist - To be Completed by Login Staff prior to committal

	Yes	No	N/A
Tray numbers entered into LIMS	☐	☐	☐
Red dots added to samples containing Volatiles and/or Dissolved Oxygen	☐	☐	☐
Samples entered into the relevant spreadsheets Holding time, Asbestos, Soil splits.	☐	☐	☐
Samples despatched - Internally and/or Externall	☐	☐	☐

Despatched to: _____

	Yes	No	N/A
COC uploaded prior to committal	☐	☐	☐
Relevant COC comments copied to LIMS	☐	☐	☐
Freight / Forwarding fee added	☐	☐	☐

	N/A	Amber	PFAS
Extra Bottles for QC entered into LIMS	☐	☐	☐

Samples trayed by: _____ Date: _____

Work order committed by: _____ Date: _____

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: GHD	TURNAROUND REQUIREMENTS : ☒ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)	
OFFICE: Adelaide	(Standard TAT may be longer for some tests e.g., Ultra Trace Organics) ☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact?	Yes No N/A
	ALS QUOTE:	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT: MFS ANGLE PARK DSI	ORDER NO.: 12616808	COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Angus Robinson	CONTACT PH: 0431 177 498	OF: 1 2 3 4 5 6 7	Other comment:

SAMPLER: TW (Terrence Wilson)	SAMPLER MOBILE: 0467 034 756	RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
COC emailed to ALS? YES	EDD FORMAT (or default): Esdat	*Terrence Wilson*	*Kieren Burns*		
Email Reports to: Angus.Robinson@ghd.com; Terrence.Wilson@ghd.com; Ben.Pettlcrew@ghd.com; GHDLabReports@ghd.com		DATE/TIME: 24 October 2023; 15:00	DATE/TIME: 24 October 2023; 15:00	DATE/TIME:	DATE/TIME:
Email Invoice to: Angus.Robinson@ghd.com; accountspayableAU@ghd.com					

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	PFAS (Long Suite) - Standard LOR	HOLD							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
203	FD01	23/10/2023	S	P	1	X								
→	FS01	23/10/2023	S	P	1	X								Please forward to Eurofins
204	FD02	23/10/2023	S	P	1	X								
→	FS02	23/10/2023	S	P	1	X								Please forward to Eurofins
205	FD03	23/10/2023	S	P	1	X								
→	FS03	23/10/2023	S	P	1	X								Please forward to Eurofins
206	FB01	23/10/2023	W	P	1		X							
207	RB01	23/10/2023	W	P	1	X								
208	FB02	24/10/2023	W	P	1		X							
209	RB02A	24/10/2023	W	P	1	X								
210	FB03	25/10/2023	W	P	1		X							
211	RB03A	25/10/2023	W	P	1	X								
				TOTAL	12	9	3							

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

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: GHD	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☒ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: Adelaide		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
	ALS QUOTE:	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT: MFS ANGLE PARK DSI	ORDER NO.: 12616808	COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Angus Robinson	CONTACT PH: 0431 177 498	OF: 1 2 3 4 5 6 7	Other comment:
SAMPLER: TW (Terrence Wilson)	SAMPLER MOBILE: 0467 034 756	RELINQUISHED BY:	RECEIVED BY:
COC emailed to ALS? YES	EDD FORMAT (or default): Esdat	*Terrence Wilson*	*Kieren Burns*
Email Reports to: Angus.Robinson@ghd.com; Terrence.Wilson@ghd.com; Ben.Petticrew@ghd.com; GHDLabReports@ghd.com		DATE/TIME: 24 October 2023; 15:00	DATE/TIME: 24 October 2023; 15:00
Email Invoice to: Angus.Robinson@ghd.com; accountspayableAU@ghd.com		RELINQUISHED BY:	RECEIVED BY:
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:		DATE/TIME:	DATE/TIME:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED Including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	PFAS (Long Suite) - Standard LOR	HOLD							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
212	FD04	24/10/2023	S	P	1	X								
→	FS04	24/10/2023	S	P	1	X								Please forward to Eurofins
213	FD05	24/10/2023	S	P	1	X								
→	FS05	24/10/2023	S	P	1	X								Please forward to Eurofins
214	QC1	24/10/2023	S	P	1	X								
→	QC1A	24/10/2023	S	P	1	X								Please forward to Eurofins
215	QC2	24/10/2023	S	P	1	X								
→	QC2A	24/10/2023	S	P	1	X								Please forward to Eurofins
216	QC3	24/10/2023	S	P	1	X								
→	QC3A	24/10/2023	S	P	1	X								Please forward to Eurofins
217	QC4	25/10/2023	S	P	1	X								
→	QC4A	25/10/2023	S	P	1	X								Please forward to Eurofins
				TOTAL	12	12								

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

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: GHD	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	☒ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: Adelaide		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
	ALS QUOTE:	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT: MFS ANGLE PARK DSI	ORDER NO.: 12616808	COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Angus Robinson	CONTACT PH: 0431 177 498	OF: 1 2 3 4 5 6 7	Other comment:
SAMPLER: TW (Terrence Wilson)	SAMPLER MOBILE: 0467 034 756		
COC emailed to ALS? YES	EDD FORMAT (or default): Esdat		
Email Reports to: Angus.Robinson@ghd.com; Terrence.Wilson@ghd.com; Ben.Petticrew@ghd.com; GHDLabReports@ghd.com			
Email Invoice to: Angus.Robinson@ghd.com; accountspayableAU@ghd.com			

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Terrence Wilson	*Kieren Burns*		
DATE/TIME: 24 October 2023; 15:00	DATE/TIME: 24 October 2023; 15:00	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED Including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	PFAS (Long Suite) - Standard LOR	HOLD							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
218	RB02B	24/10/2023	W	P	1	X								
219	RB03B	25/10/2023	W	P	1	X								
				TOTAL	2	2								

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

QUALITY CONTROL REPORT

Work Order	: **EM2319782**	Page	: 1 of 7
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: ANGUS ROBINSON	Contact	: Peter Ravlic
Address	: Level 4, 211 VICTORIA SQUARE ADELAIDE SA, AUSTRALIA 5000	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9645
Project	: 12616808	Date Samples Received	: 03-Nov-2023
Order number	: ----	Date Analysis Commenced	: 06-Nov-2023
C-O-C number	: ----	Issue Date	: 10-Nov-2023
Sampler	: Terrence Wilson		
Site	:		
Quote number	: EN/000		
No. of samples received	: 8		
No. of samples analysed	: 7		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5410239)									
EM2319724-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EM2319724-006	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5410239)									
EM2319724-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5410239) - continued									
EM2319724-006	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5410239)									
EM2319724-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EM2319724-006	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5410239)									
EM2319724-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5410239) - continued									
EM2319724-001	Anonymous	EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EM2319724-006	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5410239)									
EM2319724-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EM2319724-006	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

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

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

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5410239)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.222 µg/L	89.8	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.235 µg/L	97.6	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.228 µg/L	97.2	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	95.5	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	88.8	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	88.8	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5410239)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	99.0	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	87.9	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	94.1	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	88.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	94.2	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	95.3	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	97.6	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	99.2	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	112	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	101	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	106	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5410239)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	93.7	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	106	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	116	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	91.9	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	97.7	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	102	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	91.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5410239)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5410239) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.234 µg/L	104	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.238 µg/L	108	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	88.6	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.242 µg/L	98.4	70.0	130
EP231P: PFAS Sums (QCLot: 5410239)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5410239)							
EM2319724-003	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.222 µg/L	96.6	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.235 µg/L	91.9	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.228 µg/L	84.6	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	94.6	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	78.0	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	72.5	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5410239)							
EM2319724-003	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	# 53.3	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	87.2	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	91.7	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	86.7	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	92.0	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	93.4	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	86.6	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	92.5	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	86.4	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	76.9	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	84.3	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5410239)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5410239) - continued							
EM2319724-003	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	82.5	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	76.5	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	77.6	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	84.8	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	95.2	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	83.9	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	91.5	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5410239)							
EM2319724-003	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	97.5	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.238 µg/L	107	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	99.3	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.242 µg/L	96.8	70.0	130

CERTIFICATE OF ANALYSIS

Work Order	: **EM2319782**	Page	: 1 of 7
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: ANGUS ROBINSON	Contact	: Peter Ravlic
Address	: Level 4, 211 VICTORIA SQUARE ADELAIDE SA, AUSTRALIA 5000	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9645
Project	: 12616808	Date Samples Received	: 03-Nov-2023 10:50
Order number	: ----	Date Analysis Commenced	: 06-Nov-2023
C-O-C number	: ----	Issue Date	: 10-Nov-2023 12:27
Sampler	: Terrence Wilson		
Site	:		
Quote number	: EN/000		
No. of samples received	: 8		
No. of samples analysed	: 7		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC

General Comments

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

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

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

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

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

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

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

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- EP231X: Poor matrix spike recovery for sample EM2319724-003 due to sample matrix interference.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW01	MW02	MW03	MW04	MW05
				Sampling date / time	02-Nov-2023 00:00	02-Nov-2023 00:00	02-Nov-2023 00:00	02-Nov-2023 00:00	02-Nov-2023 00:00
Compound	CAS Number	LOR	Unit		EM2319782-001	EM2319782-002	EM2319782-003	EM2319782-004	EM2319782-005
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.02**	<0.02	**0.05**	**0.03**	**5.82**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.03**	<0.02	**0.04**	<0.02	**5.95**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.28**	<0.01	**0.18**	**0.07**	**43.1**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.04**	<0.02	<0.02	<0.02	**2.55**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**1.52**	<0.01	**0.02**	<0.01	**44.4**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	**0.03**
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	**0.5**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.04**	<0.02	**0.14**	**0.02**	**3.27**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.05**	<0.02	**0.16**	**0.05**	**14.0**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.02**	<0.02	**0.03**	<0.02	**1.72**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.04**	<0.01	<0.01	<0.01	**2.29**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	**0.03**
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	**0.15**
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MW01	MW02	MW03	MW04	MW05
				Sampling date / time	02-Nov-2023 00:00	02-Nov-2023 00:00	02-Nov-2023 00:00	02-Nov-2023 00:00	02-Nov-2023 00:00
Compound	CAS Number	LOR	Unit		EM2319782-001	EM2319782-002	EM2319782-003	EM2319782-004	EM2319782-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	**5.67**
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	**0.26**
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**2.04**	<0.01	**0.62**	**0.17**	**130**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**1.80**	<0.01	**0.20**	**0.07**	**87.5**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**1.97**	<0.01	**0.58**	**0.17**	**121**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**100**	**88.4**	**107**	**94.3**	**106**
13C8-PFOA	----	0.02	%		**103**	**86.4**	**103**	**101**	**93.6**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	FD01	RB01	----	----	----
				Sampling date / time	02-Nov-2023 00:00	02-Nov-2023 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EM2319782-006	EM2319782-008	--------	--------	--------
					Result	Result	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**6.06**	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**6.40**	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**44.2**	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**2.80**	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**46.0**	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		**0.03**	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		**0.6**	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**3.56**	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**14.9**	<0.02	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**1.83**	<0.02	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**2.29**	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		**0.02**	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		**0.14**	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	FD01	RB01	----	----	----
				Sampling date / time	02-Nov-2023 00:00	02-Nov-2023 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EM2319782-006	EM2319782-008	--------	--------	--------
					Result	Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		**5.11**	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		**0.28**	<0.05	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**134**	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**90.2**	<0.01	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**125**	<0.01	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**102**	**106**	----	----	----
13C8-PFOA	----	0.02	%		**98.0**	**104**	----	----	----

Surrogate Control Limits

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

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM2319782**	Page	: 1 of 5
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: ANGUS ROBINSON	Telephone	: +6138549 9645
Project	: 12616808	Date Samples Received	: 03-Nov-2023
Site	:	Issue Date	: 10-Nov-2023
Sampler	: Terrence Wilson	No. of samples received	: 8
Order number	: ----	No. of samples analysed	: 7

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP231B: Perfluoroalkyl Carboxylic Acids	EM2319724--003	Anonymous	**Perfluorobutanoic acid (PFBA)**	375-22-4	53.3 %	73.0-129%	**Recovery less than lower data quality objective**

Analysis Holding Time Compliance

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

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

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

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

Matrix: **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) MW01, MW02, MW03, MW04, MW05, FD01, RB01	**02-Nov-2023**	**08-Nov-2023**	30-Apr-2024	✓	**09-Nov-2023**	30-Apr-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X) MW01, MW02, MW03, MW04, MW05, FD01, RB01	**02-Nov-2023**	**08-Nov-2023**	30-Apr-2024	✓	**09-Nov-2023**	30-Apr-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) MW01, MW02, MW03, MW04, MW05, FD01, RB01	**02-Nov-2023**	**08-Nov-2023**	30-Apr-2024	✓	**09-Nov-2023**	30-Apr-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) MW01, MW02, MW03, MW04, MW05, FD01, RB01	**02-Nov-2023**	**08-Nov-2023**	30-Apr-2024	✓	**09-Nov-2023**	30-Apr-2024	✓

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
MW01, MW02, MW03, MW04, MW05, FD01, RB01	**02-Nov-2023**	**08-Nov-2023**	30-Apr-2024	✓	**09-Nov-2023**	30-Apr-2024	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

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

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

CHAIN OF CUSTODY

ALS Environmental

ALS Laboratory: please tick →

CLIENT: GHD	**TURNAROUND REQUIREMENTS :** (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)	☒ Standard TAT **(List due date):**	**FOR LABORATORY USE ONLY (Circle)**
OFFICE: Adelaide		☐ Non Standard or urgent TAT **(List due date):**	Custody Seal Intact? Yes No N/A
	ALS QUOTE:	**COC SEQUENCE NUMBER (Circle)**	Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT: MFS ANGLE PARK DSI	**ORDER NO.:** 12616808	COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Angus Robinson	**CONTACT PH:** 0431 177 498	OF: 1 2 3 4 5 6 7	Other comment:
SAMPLER: TW (Terrence Wilson)	**SAMPLER MOBILE:** 0467 034 756	**RELINQUISHED BY:**	**RECEIVED BY:**
COC emailed to ALS? YES	**EDD FORMAT (or default):** Esdat	*Terrence Wilson*	*Phil*
Email Reports to: Angus.Robinson@ghd.com; Terrence.Wilson@ghd.com; Ben.Petticrew@ghd.com; GHDLabReports@ghd.com		DATE/TIME: 2 November 2023; 16:00	DATE/TIME: 2 November 2023; 16:00
Email Invoice to: Angus.Robinson@ghd.com; accountspayableAU@ghd.com		**RELINQUISHED BY:** DATE/TIME:	**RECEIVED BY:** DATE/TIME: 3/11 10:50 Reml

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where **Metals** are required, specify **Total** (unfiltered bottle required) or **Dissolved** (field filtered bottle required).								
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	PFAS (Long Suite) - Standard LOR	HOLD							
1	MW01	2/11/2023	W	P	2	X								
2	MW02	2/11/2023	W	P	2	X								
3	MW03	2/11/2023	W	P	2	X								
4	MW04	2/11/2023	W	P	2	X								
5	MW05	2/11/2023	W	P	2	X								
6	FD01	2/11/2023	W	P	2	X								
→	FS01	2/11/2023	W	P	2	X		Please forward to Eurofins						
7	FB01	2/11/2023	W	P	2		X							
8	RB01	2/11/2023	W	P	2	X								
				TOTAL	18	8	1							

Environmental Division Melbourne
Work Order Reference
EM2319782

Telephone : + 61-3-8549 9600

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

Scott Huett

From: Peter Ravlic
Sent: Friday, 3 November 2023 5:21 PM
To: COC Melbourne
Subject: GHDSER COC - 12616808_MFS Angle Park DSI GME_COC - Incoming Samples
Attachments: 12616808_MFS Angle Park GME COC_20231102.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: COC for incoming samples

Kind Regards

ALS Melbourne will be closed on Tuesday, November 7th, for the Melbourne Cup Public Holiday.

right solutions. right partner.

Peter Ravlic
Client Services
ALS Limited

Ph: +61 3 8549 9600
peter.ravlic@alsglobal.com

2-4 Westall Road, Springvale VIC 3171

alsglobal.com

From: Terrence Wilson <Terrence.Wilson@ghd.com>
Sent: Friday, 3 November 2023 5:13 PM
To: Kieren Burns <Kieren.Burns@alsglobal.com>; Peter Ravlic <peter.ravlic@alsglobal.com>
Cc: Angus Robinson <Angus.Robinson@ghd.com>
Subject: [EXTERNAL] - 12616808_MFS Angle Park DSI GME_COC

CAUTION: This email originated from outside of ALS. Do not click links or open attachments unless you recognize the sender and are sure content is relevant to you.

Hi Kieren/Peter,

Please find attached COC for samples submitted on the 2nd November 2023 for Project: 12616808 (standard TAT).

As noted in the COC, kindly forward the following QA/QC samples to Eurofins for inter-lab analysis:

- FS01

Please let me know if there are any questions.

Thanks and regards,

Terrence Wilson
Environmental Scientist

GHD

eurofins

web: www.eurofins.com.au
email: EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West NSW 2304
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	Tel: +61 2 4968 8448
Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

Eurofins ARL Pty Ltd
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46-48 Banksia Road
Welshpool
WA 6106
Tel: +61 8 6253 4444
NATA# 2377
Site# 2370

Eurofins Environment Testing NZ Ltd
NZBN: 9429046024954

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35 O'Rorke Road	43 Detroit Drive	1277 Cameron Road,
Penrose,	Rolleston,	Gate Pa,
Auckland 1061	Christchurch 7675	Tauranga 3112
Tel: +64 9 526 4551	Tel: +64 3 343 5201	Tel: +64 9 525 0568
IANZ# 1327	IANZ# 1290	IANZ# 1402

Company Name: GHD Pty Ltd SA
Address: GPO Box 2052
Adelaide
SA 5001

Project Name: MFS ANGLE PARK DSI
Project ID: 12616808

Order No.:
Report #: 1040245
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Nov 1, 2023 9:00 AM
Due: Nov 9, 2023
Priority: 5 Day
Contact Name: Angus Robinson

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	FS01	Oct 23, 2023		Soil	M23-No0002030	X	X
2	FS02	Oct 23, 2023		Soil	M23-No0002031	X	X
3	FS03	Oct 23, 2023		Soil	M23-No0002032	X	X
4	FS04	Oct 23, 2023		Soil	M23-No0002033	X	X
5	FS05	Oct 23, 2023		Soil	M23-No0002034	X	X
6	QC1A	Oct 24, 2023		Soil	M23-No0002035	X	X
7	QC2A	Oct 24, 2023		Soil	M23-No0002036	X	X
8	QC3A	Oct 24, 2023		Soil	M23-No0002037	X	X
Test Counts						8	8

eurofins | Environment Testing

www.eurofins.com.au EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West NSW 2304
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	Tel: +61 2 4968 8448
Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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46-48 Banksia Road
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WA 6106
Tel: +61 8 6253 4444
NATA# 2377
Site# 2370

Eurofins Environment Testing NZ Ltd

NZBN: 9429046024954

Auckland	Christchurch	Tauranga
35 O'Rorke Road	43 Detroit Drive	1277 Cameron Road,
Penrose,	Rolleston,	Gate Pa,
Auckland 1061	Christchurch 7675	Tauranga 3112
Tel: +64 9 526 4551	Tel: +64 3 343 5201	Tel: +64 9 525 0568
IANZ# 1327	IANZ# 1290	IANZ# 1402

Sample Receipt Advice

Company name:	GHD Pty Ltd SA
Contact name:	Angus Robinson
Project name:	MFS ANGLE PARK DSI
Project ID:	12616808
Turnaround time:	5 Day
Date/Time received	Nov 1, 2023 9:00 AM
Eurofins reference	1040245

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
✗	Split sample sent to requested external lab.
✗	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

SAMPLE "QC4A" NOT RECEIVED.

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Amy Meunier on phone : or by email: AmyMeunier@eurofins.com

Results will be delivered electronically via email to Angus Robinson - angus.robinson@ghd.com.

Note: A copy of these results will also be delivered to the general GHD Pty Ltd SA email address.

GHD Pty Ltd
GPO Box 2052
Adelaide
SA 5001

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Angus Robinson**

Report **1040245-S**
Project name MFS ANGLE PARK DSI
Project ID 12616808
Received Date Nov 01, 2023

Client Sample ID			**FS01**	**FS02**	**FS03**	**FS04**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**M23-No0002030**	**M23-No0002031**	**M23-No0002032**	**M23-No0002033**
Date Sampled			**Oct 23, 2023**	**Oct 23, 2023**	**Oct 23, 2023**	**Oct 23, 2023**
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	3.9	4.4	4.3	12
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	%	97	102	96	99
13C5-PFPeA (surr.)	1	%	114	118	110	115
13C5-PFHxA (surr.)	1	%	97	101	92	100
13C4-PFHpA (surr.)	1	%	96	95	89	94
13C8-PFOA (surr.)	1	%	98	92	83	92
13C5-PFNA (surr.)	1	%	73	83	80	92
13C6-PFDA (surr.)	1	%	97	87	82	92
13C2-PFUnDA (surr.)	1	%	107	92	96	111
13C2-PFDoDA (surr.)	1	%	113	107	112	118
13C2-PFTeDA (surr.)	1	%	118	108	111	122
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10

Client Sample ID			FS01	FS02	FS03	FS04
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-No0002030	M23-No0002031	M23-No0002032	M23-No0002033
Date Sampled			Oct 23, 2023	Oct 23, 2023	Oct 23, 2023	Oct 23, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
13C8-FOSA (surr.)	1	%	91	75	91	97
D3-N-MeFOSA (surr.)	1	%	93	87	83	92
D5-N-EtFOSA (surr.)	1	%	97	91	81	93
D7-N-MeFOSE (surr.)	1	%	93	79	84	85
D9-N-EtFOSE (surr.)	1	%	84	75	68	78
D5-N-EtFOSAA (surr.)	1	%	104	99	95	120
D3-N-MeFOSAA (surr.)	1	%	94	91	91	106
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	[N09]7.8	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	[N09]32	[N09]27	10	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	89	91	82	91
18O2-PFHxS (surr.)	1	%	99	90	78	91
13C8-PFOS (surr.)	1	%	92	69	63	81
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	19	< 10	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	110	121	101	110
13C2-6:2 FTSA (surr.)	1	%	79	80	96	93
13C2-8:2 FTSA (surr.)	1	%	112	97	98	94
13C2-10:2 FTSA (surr.)	1	%	84	69	95	102
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	39.8	27	10	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	32	27	10	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	39.8	27	10	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	58.8	27	10	< 10
Sum of PFASs (n=30)*	50	ug/kg	58.8	< 50	< 50	< 50

Client Sample ID			FS05	QC1A	QC2A	QC3A
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-No0002034	M23-No0002035	M23-No0002036	M23-No0002037
Date Sampled			Oct 23, 2023	Oct 24, 2023	Oct 24, 2023	Oct 24, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	5.5	3.6	17	17
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	%	102	103	108	89
13C5-PFPeA (surr.)	1	%	114	118	123	111
13C5-PFHxA (surr.)	1	%	97	99	106	97
13C4-PFHpA (surr.)	1	%	93	95	100	90
13C8-PFOA (surr.)	1	%	90	91	97	88
13C5-PFNA (surr.)	1	%	84	87	80	77
13C6-PFDA (surr.)	1	%	84	93	84	89
13C2-PFUnDA (surr.)	1	%	119	99	124	115
13C2-PFDoDA (surr.)	1	%	136	96	130	117
13C2-PFTeDA (surr.)	1	%	146	100	120	109
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	%	88	85	86	83
D3-N-MeFOSA (surr.)	1	%	90	91	94	89
D5-N-EtFOSA (surr.)	1	%	86	86	96	91
D7-N-MeFOSE (surr.)	1	%	94	82	91	95
D9-N-EtFOSE (surr.)	1	%	74	73	86	78
D5-N-EtFOSAA (surr.)	1	%	135	101	141	125
D3-N-MeFOSAA (surr.)	1	%	121	88	140	126
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			FS05	QC1A	QC2A	QC3A
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-No0002034	M23-No0002035	M23-No0002036	M23-No0002037
Date Sampled			Oct 23, 2023	Oct 24, 2023	Oct 24, 2023	Oct 24, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	[N09]260	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	89	95	95	89
18O2-PFHxS (surr.)	1	%	86	90	93	84
13C8-PFOS (surr.)	1	%	68	70	74	63
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	112	125	118	83
13C2-6:2 FTSA (surr.)	1	%	74	84	87	71
13C2-8:2 FTSA (surr.)	1	%	80	86	70	73
13C2-10:2 FTSA (surr.)	1	%	110	71	116	98
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	260	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	260	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	260	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	260	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	260	< 50	< 50

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
% Moisture	Melbourne	Nov 01, 2023	14 Days
- Method: LTM-GEN-7080 Moisture			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Melbourne	Nov 02, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Melbourne	Nov 02, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Melbourne	Nov 02, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Melbourne	Nov 02, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
PFASs Summations	Melbourne	Nov 01, 2023	
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Project Name: MFS ANGLE PARK DSI
Project ID: 12616808

Order No.:
Report #: 1040245
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Nov 1, 2023 9:00 AM
Due: Nov 9, 2023
Priority: 5 Day
Contact Name: Angus Robinson

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	FS01	Oct 23, 2023		Soil	M23-No0002030	X	X
2	FS02	Oct 23, 2023		Soil	M23-No0002031	X	X
3	FS03	Oct 23, 2023		Soil	M23-No0002032	X	X
4	FS04	Oct 23, 2023		Soil	M23-No0002033	X	X
5	FS05	Oct 23, 2023		Soil	M23-No0002034	X	X
6	QC1A	Oct 24, 2023		Soil	M23-No0002035	X	X
7	QC2A	Oct 24, 2023		Soil	M23-No0002036	X	X
8	QC3A	Oct 24, 2023		Soil	M23-No0002037	X	X
Test Counts						8	8

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry weight basis unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion unless otherwise stated.
4. For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
5. Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
6. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
7. SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
8. Samples were analysed on an 'as received' basis.
9. Information identified in this report with blue colour indicates data provided by customers that may have an impact on the results.
10. This report replaces any interim results previously issued.

Holding Times

Please refer to the 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours before sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling; therefore, compliance with these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is 7 days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples, these are performed on laboratory-certified clean sands and in the case of water samples, these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30%; however the following acceptance guidelines are equally applicable: Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR: RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%

PFAS field samples that contain surrogate recoveries above the QC limit designated in QSM 5.4, where no positive PFAS results have been reported, have been reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown are not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data; thus, it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/kg	< 5			5	Pass	
Perfluoropentanoic acid (PFPeA)	ug/kg	< 5			5	Pass	
Perfluorohexanoic acid (PFHxA)	ug/kg	< 5			5	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/kg	< 5			5	Pass	
Perfluorooctanoic acid (PFOA)	ug/kg	< 5			5	Pass	
Perfluorononanoic acid (PFNA)	ug/kg	< 5			5	Pass	
Perfluorodecanoic acid (PFDA)	ug/kg	< 5			5	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/kg	< 5			5	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/kg	< 5			5	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/kg	< 5			5	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 5			5	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 5			5	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/kg	< 5			5	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/kg	< 5			5	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/kg	< 5			5	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/kg	< 10			10	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/kg	< 10			10	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/kg	< 5			5	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/kg	< 5			5	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/kg	< 5			5	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/kg	< 5			5	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 5			5	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/kg	< 5			5	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 5			5	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 5			5	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/kg	< 10			10	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/kg	< 5			5	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	71			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	71			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	71			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	70			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	72			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	81			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	77			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	77			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	75			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	69			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	76			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	76			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	72			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	80			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	81			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	77			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	73			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	76			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	74			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	105			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	78			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	69			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	73			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	54			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	70			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	88			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	69			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	68			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	76			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	72			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	M23-No0002031	CP	%	74			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M23-No0002031	CP	%	74			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M23-No0002031	CP	%	76			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-No0002031	CP	%	75			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M23-No0002031	CP	%	76			50-150	Pass	
Perfluorononanoic acid (PFNA)	M23-No0002031	CP	%	87			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M23-No0002031	CP	%	74			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-No0002031	CP	%	82			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-No0002031	CP	%	81			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-No0002031	CP	%	72			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-No0002031	CP	%	80			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	M23-No0002031	CP	%	79			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-No0002031	CP	%	77			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-No0002031	CP	%	88			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-No0002031	CP	%	82			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-No0002031	CP	%	82			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-No0002031	CP	%	70			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-No0002031	CP	%	83			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M23-No0002031	CP	%	78			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-No0002031	CP	%	94			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-No0002031	CP	%	80			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-No0002031	CP	%	74			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-No0002031	CP	%	81			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-No0002031	CP	%	62			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-No0002031	CP	%	86			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M23-No0002031	CP	%	70			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-No0002031	CP	%	75			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-No0002031	CP	%	76			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-No0002031	CP	%	74			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M23-No0002030	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M23-No0002030	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M23-No0002030	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-No0002030	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M23-No0002030	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M23-No0002030	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M23-No0002030	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-No0002030	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-No0002030	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-No0002030	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-No0002030	CP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M23-No0002030	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-No0002030	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-No0002030	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-No0002030	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-No0002030	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-No0002030	CP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-No0002030	CP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M23-No0002030	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-No0002030	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-No0002030	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-No0002030	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-No0003742	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-No0002030	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-No0003742	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-No0002030	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M23-No0002030	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-No0003742	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-No0002030	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-No0002030	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	M23-No0002031	CP	%	4.4	4.3	2.5	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:

Amy Meunier	Analytical Services Manager
Joseph Edouard	Senior Analyst-PFAS

Glenn Jackson
Managing Director

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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CHAIN OF CUSTODY

ALS Laboratory: please tick →

Report: 1040245 404 1/2
1/11 BF

CLIENT: GHD	TURNAROUND REQUIREMENTS : ☒ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: Adelaide	(Standard TAT may be longer for some tests e.g.. Ultra Trace Organics) ☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
	ALS QUOTE:	COC SEQUENCE NUMBER (Circle)
PROJECT: MFS ANGLE PARK DSI	ORDER NO.: 12616808	COC: 1 2 3 4 5 6 7
PROJECT MANAGER: Angus Robinson	CONTACT PH: 0431 177 498	OF: 1 2 3 4 5 6 7
SAMPLER: TW (Terrence Wilson)	SAMPLER MOBILE: 0467 034 756	Free ice / frozen ice bricks present upon receipt? Yes No N/A
COC emailed to ALS? YES	EDD FORMAT (or default): Esdat	Random Sample Temperature on Receipt. °C
Email Reports to: Angus.Robinson@ghd.com; Terrence.Wilson@ghd.com; Ben.Petticrew@ghd.com; GHDLabReports@ghd.com		Other comment:
Email Invoice to: Angus.Robinson@ghd.com; accountspayableAU@ghd.com		

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Terrence Wilson	*Kieren Burns*	SR (ALS)	
DATE/TIME: 24 October 2023; 15:00	DATE/TIME: 24 October 2023; 15:00	DATE/TIME: 31/10/2023	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

* ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	PFAS (Long Suite) - Standard LOR	HOLD							
203	FD01	23/10/2023	S	P	1	X								
→	FS01	23/10/2023	S	P	1	X								Please forward to Eurofins
204	FD02	23/10/2023	S	P	1	X								
→	FS02	23/10/2023	S	P	1	X								Please forward to Eurofins
205	FD03	23/10/2023	S	P	1	X								
→	FS03	23/10/2023	S	P	1	X								Please forward to Eurofins
206	FB01	23/10/2023	W	P	1		X							
207	RB01	23/10/2023	W	P	1	X								
208	FB02	24/10/2023	W	P	1		X							
209	RB02A	24/10/2023	W	P	1	X								
210	FB03	25/10/2023	W	P	1		X							
211	RB03A	25/10/2023	W	P	1	X								
				TOTAL	12	9	3							

DATE: 1/11/23
TIME: 9am
COC R:
TEMPERATURE 9.3
ATTEMPT TO CHILL: YES
5.0≤

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

CHAIN OF CUSTODY

ALS Laboratory: please tick →

404 2/2

CLIENT: GHD	**TURNAROUND REQUIREMENTS :** (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☒ Standard TAT (List due date):	**FOR LABORATORY USE ONLY (Circle)**
OFFICE: Adelaide		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
	ALS QUOTE:	**COC SEQUENCE NUMBER (Circle)**	Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT: MFS ANGLE PARK DSI	**ORDER NO.:** 12616808	COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Angus Robinson	**CONTACT PH:** 0431 177 498	OF: 1 2 3 4 5 6 7	Other comment:
SAMPLER: TW (Terrence Wilson)	**SAMPLER MOBILE:** 0467 034 756		
COC emailed to ALS? YES	**EDD FORMAT (or default):** Esdat		
Email Reports to: Angus.Robinson@ghd.com; Terrence.Wilson@ghd.com; Ben.Petticrew@ghd.com; GHDLabReports@ghd.com			
Email Invoice to: Angus.Robinson@ghd.com; accountspayableAU@ghd.com			

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Terrence Wilson	*Kieren Burns*		
DATE/TIME: 24 October 2023; 15:00	DATE/TIME: 24 October 2023; 15:00	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL CONTAINERS	PFAS (Long Suite) - Standard LOR	HOLD							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
212	FD04	24/10/2023	S	P	1	X								
→	FS04	24/10/2023	S	P	1	X								Please forward to Eurofins
213	FD05	24/10/2023	S	P	1	X								
→	FS05	24/10/2023	S	P	1	X								Please forward to Eurofins
214	QC1	24/10/2023	S	P	1	X								
→	QC1A	24/10/2023	S	P	1	X								Please forward to Eurofins
215	QC2	24/10/2023	S	P	1	X								
→	QC2A	24/10/2023	S	P	1	X								Please forward to Eurofins
216	QC3	24/10/2023	S	P	1	X								
→	QC3A	24/10/2023	S	P	1	X								Please forward to Eurofins
217	QC4	25/10/2023	S	P	1	X								
→	QC4A N.R.	25/10/2023	S	P	1	X								Please forward to Eurofins
				TOTAL	12	12								

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

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email: EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd
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Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West NSW 2304
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	Tel: +61 2 4968 8448
Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Tel: +64 9 526 4551	Tel: +64 3 343 5201	Tel: +64 9 525 0568
IANZ# 1327	IANZ# 1290	IANZ# 1402

Company Name: GHD Pty Ltd SA
Address: GPO Box 2052
Adelaide
SA 5001

Project Name: MFS ANGLE PARK DSI

Order No.:
Report #: 1041521
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Nov 6, 2023 9:00 AM
Due: Nov 14, 2023
Priority: 5 Day
Contact Name: Angus Robinson

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X
External Laboratory						
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**	
1	FS01	Nov 02, 2023		Water	M23-No0012832	X
Test Counts						1

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Eurofins Environment Testing Australia Pty Ltd

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VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	Tel: +61 2 4968 8448
Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Penrose,	Rolleston,	Gate Pa,
Auckland 1061	Christchurch 7675	Tauranga 3112
Tel: +64 9 526 4551	Tel: +64 3 343 5201	Tel: +64 9 525 0568
IANZ# 1327	IANZ# 1290	IANZ# 1402

Sample Receipt Advice

Company name:	GHD Pty Ltd SA
Contact name:	Angus Robinson
Project name:	MFS ANGLE PARK DSI
Project ID:	Not provided
Turnaround time:	5 Day
Date/Time received	Nov 6, 2023 9:00 AM
Eurofins reference	1041521

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
✗	Split sample sent to requested external lab.
✗	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Amy Meunier on phone : or by email: AmyMeunier@eurofins.com

Results will be delivered electronically via email to Angus Robinson - angus.robinson@ghd.com.

Note: A copy of these results will also be delivered to the general GHD Pty Ltd SA email address.

GHD Pty Ltd
GPO Box 2052
Adelaide
SA 5001

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Angus Robinson**

Report **1041521-W**
Project name MFS ANGLE PARK DSI
Received Date Nov 06, 2023

Client Sample ID			**FS01**
Sample Matrix			**Water**
Eurofins Sample No.			**M23-No0012832**
Date Sampled			**Nov 02, 2023**
Test/Reference	LOR	Unit	
Perfluoroalkyl carboxylic acids (PFCAs)			
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	1.3
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	3.5
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	12
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	[N09]1.5
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	[N09]2.3
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	[N09]0.02
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01
13C4-PFBA (surr.)	1	%	118
13C5-PFPeA (surr.)	1	%	129
13C5-PFHxA (surr.)	1	%	113
13C4-PFHpA (surr.)	1	%	111
13C8-PFOA (surr.)	1	%	87
13C5-PFNA (surr.)	1	%	81
13C6-PFDA (surr.)	1	%	56
13C2-PFUnDA (surr.)	1	%	78
13C2-PFDoDA (surr.)	1	%	80
13C2-PFTeDA (surr.)	1	%	80
Perfluoroalkyl sulfonamido substances			
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	[N09]0.13
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05
13C8-FOSA (surr.)	1	%	90
D3-N-MeFOSA (surr.)	1	%	48
D5-N-EtFOSA (surr.)	1	%	56

Client Sample ID			FS01
Sample Matrix			Water
Eurofins Sample No.			M23-No0012832
Date Sampled			Nov 02, 2023
Test/Reference	LOR	Unit	
Perfluoroalkyl sulfonamido substances			
D7-N-MeFOSE (surr.)	1	%	57
D9-N-EtFOSE (surr.)	1	%	58
D5-N-EtFOSAA (surr.)	1	%	92
D3-N-MeFOSAA (surr.)	1	%	96
Perfluoroalkyl sulfonic acids (PFSAs)			
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	[N09]6.1
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	[N09]0.14
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	2.5
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	[N09]6.2
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	[N09]45
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	[N09]2.2
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]50
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.1
13C3-PFBS (surr.)	1	%	114
18O2-PFHxS (surr.)	1	%	106
13C8-PFOS (surr.)	1	%	106
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	5.2
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	0.19
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01
13C2-4:2 FTSA (surr.)	1	%	137
13C2-6:2 FTSA (surr.)	1	%	106
13C2-8:2 FTSA (surr.)	1	%	74
13C2-10:2 FTSA (surr.)	1	%	80
PFASs Summations			
Sum (PFHxS + PFOS)*	0.01	ug/L	95
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	52.3
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	97.3
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	127.09
Sum of PFASs (n=30)*	0.1	ug/L	138.28

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Melbourne	Nov 09, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Melbourne	Nov 09, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Melbourne	Nov 09, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Melbourne	Nov 09, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
PFASs Summations	Melbourne	Nov 06, 2023	
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

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Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Project Name: MFS ANGLE PARK DSI

Order No.:
Report #: 1041521
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Nov 6, 2023 9:00 AM
Due: Nov 14, 2023
Priority: 5 Day
Contact Name: Angus Robinson

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X
External Laboratory						
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**	
1	FS01	Nov 02, 2023		Water	M23-No0012832	X
Test Counts						1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry weight basis unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion unless otherwise stated.
4. For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
5. Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
6. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
7. SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
8. Samples were analysed on an 'as received' basis.
9. Information identified in this report with blue colour indicates data provided by customers that may have an impact on the results.
10. This report replaces any interim results previously issued.

Holding Times

Please refer to the 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours before sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling; therefore, compliance with these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is 7 days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples, these are performed on laboratory-certified clean sands and in the case of water samples, these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30%; however the following acceptance guidelines are equally applicable: Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR: RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%

PFAS field samples that contain surrogate recoveries above the QC limit designated in QSM 5.4, where no positive PFAS results have been reported, have been reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown are not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data; thus, it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	88			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	94			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	87			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	84			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	86			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	98			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	95			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	96			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	89			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	61			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	95			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	98			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	79			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	125			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	99			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	94			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	96			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	95			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	92			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	89			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	108			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	83			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	83			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	108			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	89			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	71			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	91			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	88			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	90			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	90			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	M23-No0019092	NCP	%	92			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M23-No0019092	NCP	%	94			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M23-No0019092	NCP	%	93			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-No0019092	NCP	%	88			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M23-No0019092	NCP	%	92			50-150	Pass	
Perfluorononanoic acid (PFNA)	M23-No0019092	NCP	%	101			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M23-No0019092	NCP	%	97			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-No0019092	NCP	%	95			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-No0019092	NCP	%	92			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-No0019092	NCP	%	50			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-No0019092	NCP	%	97			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	M23-No0019092	NCP	%	96			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-No0019092	NCP	%	101			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-No0019092	NCP	%	117			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-No0019092	NCP	%	92			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-No0019092	NCP	%	90			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-No0019092	NCP	%	99			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-No0019092	NCP	%	91			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M23-No0019092	NCP	%	92			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-No0019092	NCP	%	101			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-No0019092	NCP	%	105			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-No0019092	NCP	%	81			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-No0019092	NCP	%	85			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-No0019092	NCP	%	110			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-No0019092	NCP	%	93			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-No0019092	NCP	%	82			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M23-No0019092	NCP	%	91			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-No0019092	NCP	%	94			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-No0019092	NCP	%	93			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-No0019092	NCP	%	90			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorononanoic acid (PFNA)	M23-No0012832	CP	ug/L	0.02	0.02	1.8	30%	Pass	
Perfluorodecanoic acid (PFDA)	M23-No0012832	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-No0012832	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-No0012832	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-No0012832	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-No0012832	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M23-No0012832	CP	ug/L	0.13	0.13	2.1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-No0012832	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-No0012832	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-No0012832	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-No0012832	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-No0012832	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-No0012832	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M23-No0012832	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-No0012832	CP	ug/L	0.19	0.20	3.0	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-No0012832	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:

Catherine Wilson	Analytical Services Manager
Joseph Edouard	Senior Analyst-PFAS

Glenn Jackson
Managing Director

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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CHAIN OF CUSTODY

ALS Laboratory: please tick →

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CLIENT: GHD	TURNAROUND REQUIREMENTS : ☒ Standard TAT (List due date):		FOR LABORATORY USE ONLY (Circle)
OFFICE: Adelaide	(Standard TAT may be longer for some tests e.g. Ultra Trace Organics) ☐ Non Standard or urgent TAT (List due date):		Custody Seal Intact? Yes No N/A
	ALS QUOTE:	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes No N/A
PROJECT: MFS ANGLE PARK DSI	ORDER NO.: 12616808	COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: Angus Robinson	CONTACT PH: 0431 177 498	OF: 1 2 3 4 5 6 7	Other comment:

SAMPLER: TW (Terrence Wilson)	SAMPLER MOBILE: 0467 034 756	RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
COC emailed to ALS? YES	EDD FORMAT (or default): Esdat	*Terrence Wilson*	*Phil*		3/11 10:50 Revised
Email Reports to: Angus.Robinson@ghd.com; Terrence.Wilson@ghd.com; Ben.Petticrew@ghd.com; GHDLabReports@ghd.com		DATE/TIME: 2 November 2023; 16:00	DATE/TIME: 2 November 2023; 16:00	DATE/TIME:	DATE/TIME:
Email Invoice to: Angus.Robinson@ghd.com; accountspayableAU@ghd.com					

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).						
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	PFAS (Long Suite) - Standard LOR	HOLD					
1	MW01	2/11/2023	W	P	2	X						
2	MW02	2/11/2023	W	P	2	X						
3	MW03	2/11/2023	W	P	2	X						
4	MW04	2/11/2023	W	P	2	X						
5	MW05	2/11/2023	W	P	2	X						
6	FD01	2/11/2023	W	P	2	X						
→	FS01	2/11/2023	W	P	2	X						
7	FB01	2/11/2023	W	P	2		X					
8	RB01	2/11/2023	W	P	2	X						
				TOTAL	18							

Environmental Division Melbourne
Work Order Reference
EM2319782

Telephone : + 61-3-8549 9600

#1041521

Please forward to Eurofins

6/11/23

RELINQUISHED BY
RX CALL 6/11

DATE: 6/11
TIME: 9:09 BF
COURIER:
TEMPERATURE 7.6°

ATTEMPTED CHILL: YES / NO

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

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