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JME20005-5 – 21D and 21F School Drive Tomago

Groundwater Contamination Assessment Report 13 July 2021

For and on behalf of JM Environments



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No. of copies	Report File Name	Report Status	Date	Distributed to	Initials
1 x pdf	JME20005-5 Groundwater Contamination Assessment Report 21D and 21F School	Final	25/04/2021	Jackson Environment and Planning	RL
1 x pdf	JME20005-5 Groundwater Contamination Assessment Report 21D and 21F School Drive Tomago	Rev 1	01/07/2021	Remondis Jackson Environment and Planning GHD	SM MJ IG
1 x pdf	JME20005-5 Groundwater Contamination Assessment Report 21D and 21F School Drive Tomago	Rev 2	13/07/2021	Remondis Jackson Environment and Planning	SM MJ

Revision 1 addresses the relevant auditors comments received by email and dated 29 May 2021.

Revision 2 addresses the relevant auditors comments received by email and dated 8 July 2021.

EXECUTIVE SUMMARY

This report presents a Groundwater Sampling and Analysis Quality Plan (SAQP) commissioned by Jackson Environment and Planning Pty Ltd on behalf of Remondis Australia Pty Ltd, and undertaken by JM Environments (JME) for 21D and 21F School Drive, Tomago NSW (the site). The site is identified as Lots 8 and 11 in Deposited Plan (DP) 270328 (as defined in the website maps.six.nsw.gov.au), and is approximately 3.9 hectares in area.

The objectives of this groundwater assessment were to:

- Assess the current groundwater contamination status of Lots 8 and 11; and
- Assess the groundwater flow direction.
- Improve understanding of the contamination status of groundwater beneath the site.

The site is situated in Tomago with the topography sloping downward from north northwest to a south southeast. The groundwater flows in a similar direction.

The site has had a two main industrial land use including sand mining and metal fabrication (steel and aluminium). A soil contamination assessment by JME indicated the site soil in the eastern portion of site was impacted with arsenic, copper, cadmium, lead and zinc. Lead exceeded the human health criteria whilst the remaining metals exceeded the ecological criteria. The RAP prepared by JME recommended the excavation and removal of the significant lead impacted areas with capping and stormwater management to mitigate potential offsite ecological impacts of arsenic, copper, cadmium and zinc.

The groundwater monitoring undertaken on 13 April 2021 was undertaken after a significant rainfall event in March 2021 where 459mm of rainfall was recorded at the Williamstown Base and another 40mm of rainfall was recorded on 8 April 2021. By comparison, 46.8mm of rainfall was recorded in the thirty days preceding the groundwater monitoring event on 11 June 2021. The difference in rainfall preceding the monitoring events had an expected effect on the groundwater depth which was higher on the 13 April across the wells monitored. Similarly with the historical electrical conductivity data displayed in Graphs 1-3, the electrical conductivity of the two upgradient wells, MW6 and MW9, were relatively stable when compared to the remaining wells.

Groundwater monitoring indicated that the impact of arsenic, cadmium and copper in soil on the groundwater is negligible across both sampling rounds with the lower concentrations being observed in the second monitoring round. Cadmium has not exceeded the DGV in the samples in the recent monitoring rounds. Copper concentrations were slightly above the DGV in the first round, with no exceedances in the second monitoring round. Chromium slightly exceeded the DGV in both monitoring rounds. There were no exceedances of lead in either sampling rounds in the monitoring wells sampled.

Zinc was significantly elevated at MW7 with a concentration of 89 µg/L compared to trigger value of 15 µg/L in the first monitoring round and less than the trigger value with a concentration of 5µg/L in the second monitoring round. Monitoring well MW7 was in the vicinity, but down hydraulic gradient of, the highest soil zinc impacts reported in JME20005-2. It appears that the form of zinc present in the soil is more labile than the forms of the other metals that have impacted the soils in the vicinity of MW7. The difference in the zinc concentrations in the two monitoring rounds was likely to be caused by the 10-fold difference in rainfall in the thirty days leading up to the monitoring events. The highest zinc groundwater concentration, 220µg/L was detected in monitoring well MW10, located in Lot 11. It was reasonably assumed that a significant proportion of the surface soils were removed from Lot 11 and on this basis is expected that the zinc in this area would self attenuate.

The highest zinc soil impacts are associated with the highest lead soil impacts and, as such, are planned to be removed from the site or placed under a cap in the remediation process.

PFOA detections were significantly lower than the adopted human health trigger values and the NEMP2.0 99% ecological protection value. The PFOS+PFHxS concentration exceeded the adopted human health trigger by 20% in monitoring well MW4 in the second monitoring event and was below it the first monitoring event. The PFOS+PFHxS concentrations were below the adopted human health trigger in the remaining wells across both monitoring events. The concentration PFOS was detected in the downgradient wells were almost 30 times greater than the NEMP2.0 99% ecological protection value. Although the concentrations in the wells nearer to the Varley site are slightly higher and gradually diminish across the site, the concentrations of PFOS are similar enough in the PFAS impacted wells to consider its presence is unlikely to be caused by onsite migration from the neighbouring site. Therefore, it is considered possible that PFAS was either previously used on site or a significant (bush) fire threatened the site. Either way, the primary source has been removed from site and no significant PFAS soil concentrations (secondary source) were reported in JME2005-2, thus groundwater concentrations of PFAS should naturally attenuate with time. No PFOS was detected in the upgradient wells, MW6 and MW9.

It is difficult to assign trends in concentrations from 2 rounds of monitoring and its recommended that additional rounds of monitoring are undertaken to provide a better understanding of the background values. This will assist the assessment the remediation effort required to minimise the impact on offsite receptors in a sustainable fashion.

The site is within the TAC buffer zone. The TAC buffer zone is a special environment management zone and is define in the TAC conditions of consent and is derived from the ambient fluoride levels associated with TAC operations. Fluoride and aluminium concentrations were largest in the upgradient wells and appeared to diminish the further away from TAC the groundwater well was located. Aluminium concentrations were 160 times greater than the adopted trigger value in monitoring well MW9 and 129 greater in monitoring well MW6. On this basis, aluminium is considered to be highest ecological risk to down gradient receptors.

No further action is required for fluoride and aluminium because these will continue to migrate onto site whilst the TAC smelter is still operable. The concentration of fluoride does exceed the drinking water guidelines in some wells and therefore the drinking of groundwater should be strictly prohibited on site.

JME considers that the elevated arsenic, cadmium, copper, lead and zinc concentrations in soil had not had a significant impact on the site's groundwater. It was noted that zinc was significantly elevated in a monitoring well, MW7, near the sites boundary following a significant rainfall event and was below the DGV in the second monitoring event. The zinc impacted soils with the highest concentrations are associated with the lead impacted soils that are planned to be removed along with the placement of a cap over a portion of site. The cap, in conjunction with a storm water system was intended to reduce stormwater percolation through the soil thereby reducing the metal leaching potential. PFAS concentrations were considered not to be risk to human health and would attenuate as there were no continuing sources.

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ACRONYMS

ABC	ambient background concentration
ACM	asbestos containing material
AEC	Area of Environmental Concern
ANZECC	Australian and New Zealand Environment and Conservation Council
APHA	American Public Health Association
ARMCANZ	Agriculture and Resource Management Council of Australia and New Zealand
BaP	benzo[a]pyrene
BaP TEQ	benzo[a]pyrene toxicity equivalent quotient
BTEX	benzene, toluene, ethylbenzene and xylene
COC	Contaminant of Concern
CoC	Chain of Custody
CSM	Conceptual Site Model
DEC	Department of Environment and Conservation
DO	dissolved oxygen
DP	Deposited Plan
DQI	Data Quality Indicator
DSI	Detailed Site Investigation
EC	electrical conductivity
EIL	ecological investigation level
ENM	Excavated Natural Material
EPA	Environment Protection Authority
ESL	ecological screening level
HIL	health investigation level
HSL	health screening level
HSE	health, safety and the environment
JME	JM Environments
LEP	Local Environmental Plan
LOR	limit of reporting
LTEMP	Long Term Environmental Management Plan
mbgl	metres below ground level
NATA	National Association of Testing Authorities

NEPM	National Environment Protection (Assessment of Site Contamination) Measure
OCP	organochlorine pesticides
PAH	polycyclic aromatic hydrocarbons
PCB	polychlorinated biphenyls
PID	photoionisation detector
PPE	personal protective equipment
PSH	phase separated hydrocarbons
QA/QC	Quality Assurance/Quality Control
RAP	Remedial Action Plan
RL	relative level
RPD	relative percentage difference
SAQP	Sampling and Analysis Quality Plan
SD	standard deviation
SGS	SGS Australia, Sydney
TPH	total petroleum hydrocarbons
SWMS	Safe Work Method Statement
TCLP	toxicity characteristic leaching procedure
TRH	total recoverable hydrocarbons
UCL	upper confidence limit
USEPA	United States Environment Protection Authority
UST	underground storage tank
VCH	volatile chlorinated hydrocarbons
VOC	volatile organic compounds
WA DoH	Western Australian Department of Health

1 INTRODUCTION

This report presents a Groundwater Sampling and Analysis Quality Plan (SAQP) commissioned by Jackson Environment and Planning Pty Ltd on behalf of Remondis Australia Pty Ltd, and undertaken by JM Environments (JME) for 21D and 21F School Drive, Tomago NSW (the site). The site is identified as Lots 8 and 11 in Deposited Plan (DP) 270328 (as defined in the website maps.six.nsw.gov.au), and is approximately 3.9 hectares in area. The site location is shown in Figure 1.

1.1 Background

1.1.1 General Area Information

The site is located in Tomago NSW. Beneath the site is the Tomago Sand Aquifer. Hunter Water extract water from this aquifer and following treatment the extracted water forms part of the Hunter regions reticulated drinking water supply. Hunter Waters groundwater extraction areas is the north and west of the site. It is expected the regional ground water flow would be toward the Hunter River and as such groundwater from the site is not likely to affect the quality of groundwater extracted by Hunter Water.

The Williamstown RAAF base is located approximately 9.5km north west of the site. The per- and poly-fluoroalkyl substances (PFAS) groundwater contamination associated Williamstown RAAF base are unlikely to impact on the site's groundwater. Located to the west of the site the Varley Group manufacturing facility. Amongst the specialised vehicle manufactured include fire fighting trucks. On that basis it was considered that testing of new fire trucks, including spraying PFAS foams, feasible.

The Tomago Aluminium Company (TAC) is located just over 200m to the west of the site. It has been smelting aluminium since 1983. The *"Tomago Aluminium Company Pty Ltd Production Capacity Increase 585,000 to 600,000 tonnes Saleable Production Project Description and Statement of Environment Effects"*, dated August 2016 reports that fluoride concentrations measured in its "eastern boundary bores" ranged from 5.2-6.6mg/L between 2011 and 2015. JME has assumed that the fluoride concentration are an average of six wells located off the TAC site and in proximity to the TAC eastern boundary.

1.1.2 Detailed Soil Assessment

A Detailed Contamination Assessment (DCA) was prepared by JME, dated 17 July 2021, (herein referred to as JME2005-2).. JME2005-2 reported the site was mostly flat, and divided into two parts. The western part of the site (Lot 11) was paved, and contained two large sheds, and some smaller buildings and water tanks. Beneath the pavement was brown gravelly sand, containing some concrete and brick rubble to a depth of between 1mbgl and 1.8mbgl and was interpreted to be fill. This material was assessed during the construction phase as meeting the criteria for general solid waste or excavated natural material, and for commercial/industrial land use. Light brown fine to medium grained sand beneath the fill was interpreted as representing in-situ, 'natural' material.

The eastern part of the site (Lot 8) was unpaved, and sparsely covered with grass and other low vegetation. Fill mounds including concrete, metal and timber were observed, and concrete beams and concrete-filled tyres had been stockpiled in the northern part of Lot 8.

Fill, comprising brown to black sand, and containing some plastic, road base gravel, brick, concrete, metal and rocks, was observed to a depth of approximately 0.5 - 1mbgl across much of

Lot 8. Elevated zinc and copper concentrations in this material were considered to be consistent with the use of sandblasting in the metal manufacturing process.

Beneath the fill, brown sand, interpreted as representing in-situ material, appeared to be largely uncontaminated.

Elevated cadmium, arsenic and lead concentrations were observed in dark sandy material on the surface in the northeast corner of the site.

Based on this assessment, it was considered that the site had been impacted by contamination comprising heavy metals at concentrations exceeding guideline values for commercial/ industrial land use. JME considers that the site could meet the environmental requirements for commercial/industrial land use subject to the development and successful implementation of an appropriate Remedial Action Plan. In Lot 8, the RAP recommended the excavation and removal of the human health impacted material, capping the remainder of site with a low permeable material and installation of a stormwater drainage system.

1.1.3 Groundwater Monitoring

At the request of Remondis, groundwater contamination was not considered in JME20005-2 for budgetary purposes at the early stages of this project. JME had conducted groundwater monitoring during construction and operational phase of the Midal Cables facility, the previous land use on Lot 11. Midal Cables produced electrical transmission cable from molten aluminium produced at TAC. Midal Cables operated from March 2014-April 2017.

Construction groundwater monitoring was required as part of the consent conditions for the Midal Project on Lot 11. Construction groundwater monitoring was aimed primarily at dewatering areas of the site for building sumps and footings in the north western portion of Lot 11 and hence potential activation of potential acid sulfate soils. Three groundwater wells, MW1-MW3 were installed along the north western boundary of Lot 11 and the depth to groundwater and pH were monitored. There was a drop of around 1.1-1.4 pH units in one month of the monitoring, May 2013, which was at the height of the construction dewatering. The pH returned to the normal range in the respective wells the following month. Monitoring wells MW1-MW3 were removed during the building project. Well locations are shown in Figure 2.

Operational ground water monitoring was required to satisfy the Operational Environmental Management Plan (OEMP) and the Environmental Protection Licence 20254 (EPL) for the Midal Cables International plant.

The OEMP recognised that there were potential impacts on the local groundwater quality from use of the Waste Water Treatment Plant (WWTP) and spills entering the storm water infiltration system. The OEMP required that:

- Static water level, pH and electrical conductivity (EC) on a monthly basis for the first quarter of operation then quarterly thereafter; and
- Major ions (Ca, Mg, Na, K, Cl, CO_3^{2-} , HCO_3^- , SO_4^{2-}), dissolved metals (Al, As, Cr, Cd, Cu, Fe, Hg, Mn, Ni, Pb, Zn), nutrients (total nitrogen (including ammonia) and total phosphorous), and total petroleum hydrocarbons (TPH ($\text{C}_6\text{-C}_{36}$)) on an annual basis,

be monitored in one up gradient well (OEMP monitoring well MW6, EPL Point 8) and two down gradient wells (monitoring well MW4/EPL Point 6 and monitoring well MW5/EPL Point 7). Well locations are shown in Figure 2.

The EPL required that:

- Static water level, pH and EC on a monthly basis; and

- Nutrients and hydrocarbons on a quarterly basis,
- be monitored in MW4/EPL point 6, MW5/EPL Point 7 and MW6/EPL Point 8.

The groundwater monitoring results for monitoring wells MW4-MW6 from February 2013 until December 2016 are summarised in Summary Table 1. The heavy metal concentrations were relatively stable over the monitoring period and no increasing or decreasing trends were detected using the Mann-Kendall Trend Test Analysis.

Elevated soil concentrations of arsenic, cadmium, copper lead and zinc were reported in JME2005-2. The minimum and maximum concentrations of these metals across monitoring wells MW4-MW6 were:

- Arsenic: <1µg/L - 2µg/L
- Cadmium: <0.1µg/L - 0.3µg/L;
- Copper: <1µg/L - 5µg/L;
- Lead: <1µg/L - 2µg/L; and
- Zinc: 5µg/L - 230µg/L.

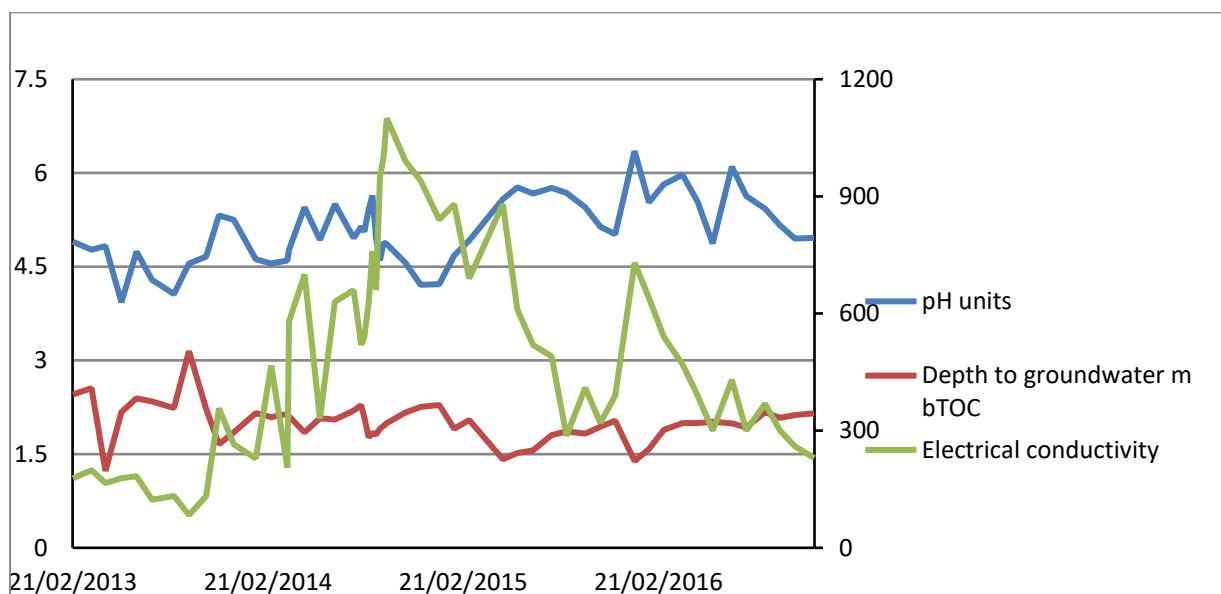
The WWTP was decommissioned around April 2015. A sewage pump out tank system was used in its stead.

Metal impacted fill on Lot 8 was unlikely to affect the groundwater on Lot 11. However:

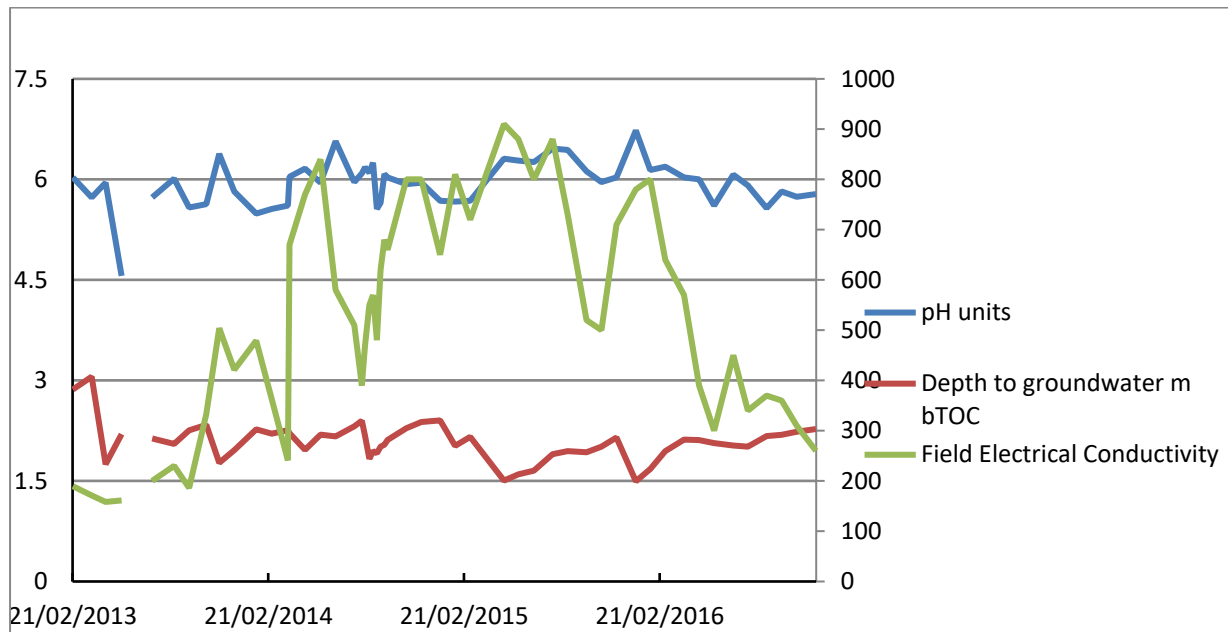
- the mean concentration of copper was greater than the default guideline value in each of the monitoring wells;
- the mean concentration of zinc was 4.8 times greater than the DGV in monitoring well MW4, 2.8 times greater than the DGV in monitoring well MW5.

The mean zinc concentrations did not exceed the DGV in monitoring well MW6. This indicates that the groundwater under Lot 11 was impacted by the previous landuses. However, JME20005-2 had assessed that the soil on Lot 11 was not significantly impacted by heavy metals.

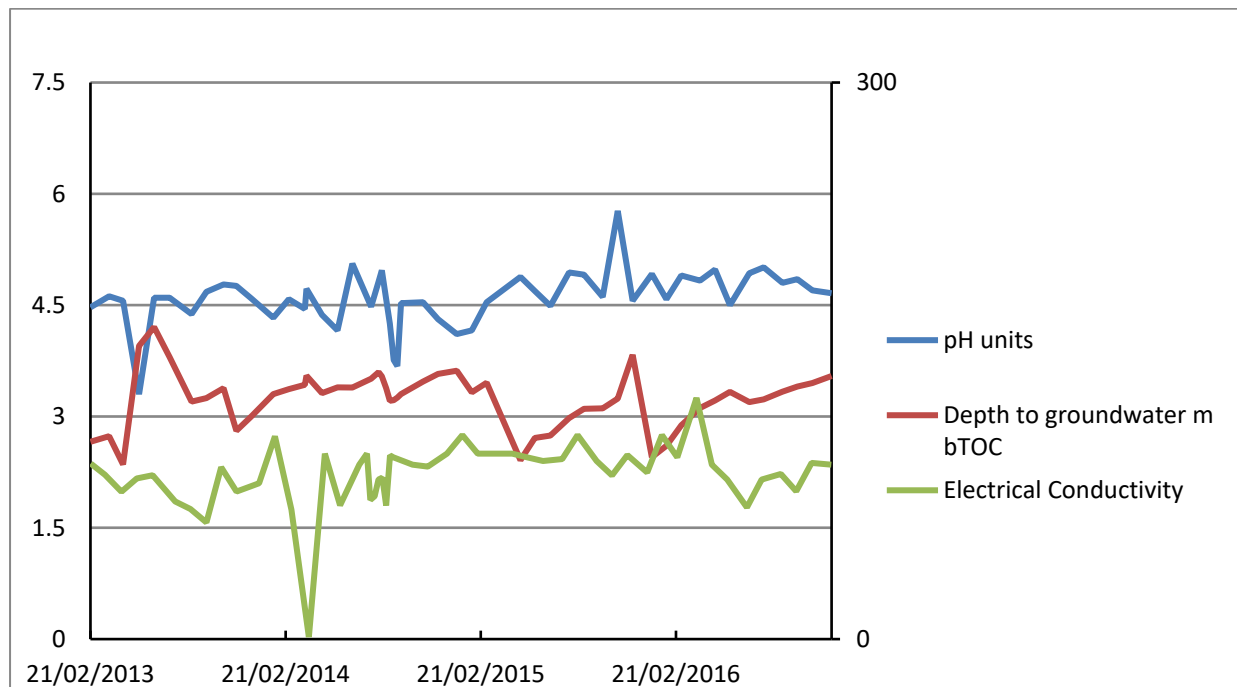
Electrical conductivity, pH and depth to groundwater was also monitored in monitoring wells MW4-MW6 from February 2013 until December 2016. These results are summarised in Graphs 1-3 below.



Graph 1: Monitoring Well MW4 historic field data



Graph 2: Monitoring Well MW5 historic field data



Graph 3: Monitoring Well MW6 historic field data

The upgradient well, MW6, returned relatively consistent electrical conductivity results over the monitoring period. The downgradient wells, MW4 and MW5, returned varied electrical conductivity results throughout the monitoring period.

1.2 Objectives

The objectives of this groundwater assessment were to:

- Assess the current groundwater contamination status of Lots 8 and 11; and
- Assess the groundwater flow direction.
- Improve understanding of the contamination status of groundwater beneath the site.

2 CONCEPTUAL SITE MODEL

Based on the summary information above and previous reports a conceptual site model was prepared.

2.1 Site History Summary

The site lies on a former sand mine and hence it is likely that the top 3-4m has been disturbed and the heavy minerals been extracted. "Tailing slimes" often have low permeabilities and are enriched in iron. Post sand mining the site was previously part of larger steel fabrication site. Metal cleaning and polishing via sand blasting was common practice for such a land use. Heavy minerals extracted from sand mining such as rutile and ilmenite and, at times, Pasminco slag sand were used as sandblasting media. From 2012-2013 the western portion of site was redeveloped in the Midal Cables facility. The Midal Cables facility manufactured aluminium transmission cable from molten aluminium sourced from the nearby TAC. During construction the site surface was classified as insitu GSW and ENM by JME. Due to the thickness of the concrete slabs and relatively short life of the facility it is considered very unlikely that the Midal operations impacted on the groundwater quality of the site with the exception of a former septic system in the southern portion of Lot 11 which is no longer in use. This is supported by the groundwater monitoring discussed in Section 1.1.3. The manufacture of aluminium cable from molten metal included the use of an emulsion to lubricate the cable strands during the drawing process. Excess emulsion was capture in an "emulsion trench" and recycled through the process. The emulsion trench was located in the northern Midal building. The trench was constructed of cement below the water table. No groundwater has appeared to have seeped into the disused trench since Midal has shut down and therefore it reasonable assume that emulsion did not leak into the groundwater when Midal was operating.

The site is adjacent to a specialised vehicle manufacturer and it is considered likely that hydrocarbons, degreasers and PFAS were used. PFAS in soil across the site was assessed in JME2005-2 and no significant concentrations were detected.

TAC is situated to the west of the site. TAC is likely to be up hydraulic gradient from the site.

2.2 Site Condition

The site appears to contain fill extended to approximately 0.3 to 1.0mbgl, and was observed to be primarily sand and include traces to some:

- Brick;
- Ceramics;
- Glass;
- Concrete;
- Coal;
- Ash; and
- Slag.

Contamination, above the adopted guidelines for industrial use, within the fill had been found to include heavy metals (arsenic, cadmium, copper, lead and zinc)

Beneath the fill, a layer of light grey to dark grey sand was observed, interpreted as representing reinstated sand mining tailings.

2.3 Source Zone Characteristics

2.3.1 Primary Groundwater Contaminant Sources

The primary source of impact on the site was considered to be heavy metal contamination resulting from sandblasting media and the metallic surface upon which they were used.

The primary source of offsite groundwater impact is the potential use of hydrocarbons, degreasers and fire fighting foams on the western neighbouring site and the smelting of aluminium further to the west.

2.3.2 Identified Contaminants of Concern

The groundwater chemicals of concern include site were considered to include:

- Hydrocarbons:
 - TRH F1
 - TRH F2
 - Benzo[a]pyrene (BaP)
 - Total PAH
- Degreasers (Chlorinated hydrocarbons, CHCs)
- Heavy metals
 - Aluminium
 - Arsenic
 - Cadmium
 - Copper
 - Lead and
 - Zinc
- PFAS

2.4 Contaminant Transport Mechanisms

Primary transport mechanism that were considered to have potential to cause the migration of contamination was predominantly the infiltration of stormwater and groundwater flow.

If present, volatile and semi volatile hydrocarbons (VHC and SVHC) in groundwater have the potential to partition into the air in the soil pore spaces and can move into buildings, ambient air, confined spaces or excavations on a site.

2.5 Contaminant Exposure Pathways

For contaminated soil to pose a risk to a receptor, a complete exposure pathway must exist between the source of the impact and the receptor. A complete exposure pathway consists of the following elements:

- A source and mechanism for release;
- A storage and/or transport medium (e.g. contaminants stored in groundwater and transported into the atmosphere via volatilisation);
- An exposure point, where the receptor comes in contact with the contamination; and
- An exposure route (e.g. inhalation).

It was considered that construction and associated earthworks during the proposed redevelopment of the site had the potential to create human health exposure pathways, including:

- Exposure to excavation/construction workers on the proposed development via dermal contact and/or incidental ingestion of COCs in groundwater; and

- Soil gas during excavation could move into the atmosphere, creating an exposure pathway to inhalation by site workers and patrons of nearby premises.
- Inhalation by site users and visitors of soil vapour through joins or fissures in the concrete slab.

Other potential exposure pathways include groundwater dependent ecosystems and surface water at the groundwater discharge point.

2.6 Identification of Receptors at Risk

Potential sensitive receptors were considered to include:

- Site workers;
- Maintenance workers;
- Trespassers; and
- Neighbouring groundwater dependent ecosystems.

TABLE 1: DP2018 CONCEPTUAL SITE MODEL

Known and Potential Primary Sources	Contaminants of Concern	Release Mechanism	Potential Impacted Media	Potential Receptors	Exposure Pathways
Site surface soils	Arsenic, cadmium, copper, lead and zinc	Infiltration of storm water	Groundwater	Site workers Maintenance workers Trespassers	Inhalation Dermal contact Incidental ingestion
Up hydraulic gradient groundwater	TRH, PAH, BTEX, CHC, PFAS, aluminium and fluoride	On site migration of groundwater	Groundwater and soil vapour	Neighbouring groundwater dependent ecosystems	Uptake of groundwater via the root system

3 DATA GAP ANALYSIS

The following gaps in the current data set were identified as needing to be addressed in order to gain a more complete understanding of the contamination status of the site.

3.1 Groundwater

The groundwater contamination status for a broad range of contaminants has been monitored on Lot 11 from 2013-2017. Although having a similar previous history, the groundwater contamination status of Lot 8 is unknown.

Additional groundwater assessment was required to increase confidence that groundwater contamination did not represent a significant AEC on the site. Groundwater assessment would assess:

- Depth and flow direction of groundwater beneath the site; and
- Contamination status of groundwater beneath the sites.

Collected data would be used to inform a decision on whether or not groundwater contamination (if present) represented regional contamination, or site-specific impact and whether remediation of groundwater, if required, is practical or not.

4 DATA QUALITY OBJECTIVES

4.1 Step 1 State the Problem

Previous assessments indicated that the site has been used for sand mining, steel manufacturing and aluminium smelting purposes, and that the surface of the site has been covered with uncontrolled fill. The previous site uses have caused the surface soils to be impacted with arsenic, cadmium, copper, lead and zinc. Offsite upgradient groundwater is known to be impacted with fluoride and potentially impacted with VHC, SVHC, CHC, PFAS and aluminium.

Problems to be addressed in this SAQP are:

- The contamination status of the groundwater beneath the site; and
- The extent, if any, of on-site migration of up gradient contamination;
- The impact of groundwater contamination on the proposed site use;
- The groundwater flow direction, hydraulic gradient and groundwater velocity.
- Potential impact of groundwater contamination on sensitive receptors.

4.2 Step 2 Identify the Decisions

The decisions that are required to be made are:

- What is the groundwater contamination status of the site?
- Is groundwater beneath the site being contaminated by on-site contamination;
- Is contamination being transported off site via groundwater migration;
- Is contamination being transported on site via groundwater migration; and
- Is remediation of the groundwater required?

4.3 Step 3 Identify the Inputs into the Decision

The primary inputs to the decision regarding soil contamination described in Step 2 are:

- Analytical results from groundwater samples collected by JME;
- Survey data and depth to groundwater data;
- Groundwater pump test data; and

- Assessment of analytical results against investigation criteria.

The primary inputs to the decision regarding groundwater contamination described in Step 2 are:

- Groundwater gradient obtained from current and proposed groundwater wells on and near the site;
- Groundwater analytical results from neighbouring locations (where available);
- Analytical results from groundwater samples collected by JME; and
- Assessment of analytical results against investigation criteria.

4.3.1 Groundwater Assessment Criteria

Drinking Water

Because the site is located in an area with a reticulated water supply, it is unlikely that groundwater would be used for domestic drinking purposes. The nearest registered domestic use groundwater well is approximately 440m down gradient (south) of the site; Likewise, it was considered unlikely groundwater would be used for recreational purposes, such as the filling of swimming pools, in an area with a reticulated water supply.

Due to the shallow (<1m) depth of groundwater beneath the site, it was considered that trench workers may potentially contact and incidentally ingest groundwater seepage in trenches on the site.

Drinking water validation criteria were established from:

- National Health and Medical Research Council (NHMRC) Australian Drinking-Water Guidelines 6, Version 3.4 Updated October 2017. National Water Quality Management Strategy;
- World Health Organization (WHO) 2017 Guidelines for drinking-water quality, 4th edition, incorporating the 1st addendum; and
- USEPA RSLs Residential Tap Water Criteria. Online database of assessment criteria that are current as of November 2017.

It was considered that incidental ingestion would only involve small amounts of groundwater, therefore a factor of 10 has been applied to non-carcinogenic contaminant criteria. It is noted that NHMRC guidelines for toluene, ethyl benzene and xylene were not adjusted by a factor of ten as they are based on the inhalation exposure pathway only. Criteria derived by the USEPA for carcinogenic compounds were multiplied by x10 to adjust the target cancer risk level from 1:1,000,000 to 1:100,000, to be consistent with Australia's recommended target cancer risk level.

Groundwater Vapour

Due to the proposed redevelopment incorporating ground floor offices, vapour intrusion was considered to be a potential exposure pathway on the site.

Groundwater beneath the site is expected to be about 2m below ground surface. CRC CARE Technical Report No. 10 Health screening levels for petroleum hydrocarbons in soil and groundwater states that at depths of <2m, soil vapour measurements should be compared with soil vapour HSLs. Soil vapour HSLs have been sourced from Table 1A(3) Soil HSLs for vapour

intrusion – Low-high density residential, in the NEPM Schedule B1, Guideline on Investigation Levels for Soil and Groundwater (see Section 5.3).

CRC CARE Technical Report No. 10 provides HSLs for contaminants in soil vapour in Table B1 Soil Vapour Health Screening Levels. Soil Vapour criteria were established for Intrusive Maintenance Worker (Shallow Trench) – 0m to <2m, as well as for HSL-D (Commercial/Industrial) use.

Adopted criteria are shown in Table 3 (below).

Protection of Aquatic Ecosystems

The investigation levels presented on the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG) website are considered applicable for the protection of the ecosystems of receiving waters. As these guidelines apply to receiving waters, it is generally conservative to apply these to groundwater on site.

ANZG advocates a site-specific approach to developing guideline trigger values, based on such factors as local biological effects data, the current level of disturbance of the ecosystem, etc. The guidelines provide detailed approaches and advice on identifying appropriate guideline values for selected indicators. These guideline values help to ensure that agreed community values and their management goals are protected.

The nearest surface water receptor is in the tidal zone of the Hunter River, approximately 890m south of site. The default guideline values from ANZG were based on slightly to moderately disturbed marine water.

PFAS National Environmental Management Plan Version 2.0

The Heads of EPAs Australia and New Zealand (HEPA) and the Australian Government Department of the Environment and Energy (DoEE) *PFAS National Environmental Management Plan*, January 2018 (the NEMP2.0) provides environmental guidance values that represent a nationally agreed suite that should be used to inform site investigations.

The potential sources of PFAS groundwater contamination were considered to be either;

- Groundwater migration from the adjoining site to the west; and/or
- Direct application to land from
 - bush firefighting activities; and/or
 - The testing of firefighting equipment manufactured on the site to the west.

No significant PFAS contamination was detected in the soils collected from five locations as reported in JME2005-2. However, JME20005-2 does indicate that that surface soils were removed from Lot 11 during the Midal project development.

NEPM2.0 requires that following the identification of a credible source or sources of PFAS, priority should be given to early investigation of risks to sensitive off-site receptors. Considerations of for a qualitative human health and ecological risk assessment are summarised in Table 2.

TABLE 2: Qualitative Human Health and Ecological PFAS Risk Assessment

Aspect	Consideration	Qualitative Risk
ingestion by livestock of contaminated stockwater (surface water and/or groundwater) and of contaminated grazing material and soil	Open paddocks 300m to south of site do not appear to be used for livestock. No nearby downgradient stock use bores	Very low

Aspect	Consideration	Qualitative Risk
Human intake of contaminated water through drinking or cooking	Because the site is located in an area with a reticulated water supply, it is unlikely that groundwater would be used for domestic drinking purposes. The nearest registered domestic use groundwater well is approximately 440m down gradient (south) of the site;	Low-Medium
Human exposure to contaminated water through activities such as cleaning, showering and swimming	As above.	Low-Medium
Consumption by humans of foodstuffs (including seafood, meat, eggs, grains, milk, fruit and vegetables) produced in the impacted area.	Rural residential properties to the south. Paddocks are overgrown with no evidence of livestock. It is possible to raise livestock/chickens etc in the future.	Low-Medium.
Exposure of terrestrial (including avian) and aquatic organisms to contaminated soil, sediments and/or water	Groundwater not expected to surface until it reaches the Hunter River. By this stage it would be likely to have undergone significant natural dilution.	Not significant
Ingestion by terrestrial (including avian) and aquatic organisms of contaminated plants and/or animals	Groundwater is around 1-1.5m below ground surface and therefore it is unlikely that root systems of grasses in lands adjoining the site would not intercept it.	Not significant

Based on the qualitative risk assessment it was considered that drinking water guidelines supplied in NEMP2.0 are appropriate for this assessment.

Adopted criteria are shown in Table 3 (below).

TABLE 3: ADOPTED GROUNDWATER CONTAMINANT TRIGGER VALUES

Analyte Name	Units	Adopted Trigger Value	Reliability/Comment
Benzene	µg/L	500	moderate
Toluene	µg/L	180	unknown
Ethylbenzene	µg/L	80	unknown
m/p-xylene	µg/L	75	unknown
o-xylene	µg/L	350	unknown
Chloroform	µg/L	370	unknown
1,1,2,2-Tetrachloroethylene	µg/L	70	unknown
1,1,2-Trichloroethylene	µg/L	330	unknown
1,1-Dichloroethylene	µg/L	700	unknown
Chloroethylene	µg/L	100	unknown
1,1,1-Trichloroethane	µg/L	270	unknown
1,1,2,2-Tetrachloroethane	µg/L	400	unknown
1,1,2-Trichloroethane	µg/L	1,900	unknown
1,2-Dichloroethane	µg/L	1,900	unknown
1,1-Dichloropropane	µg/L	500	unknown
1,2-Dichloropropane	µg/L	900	unknown

Analyte Name	Units	Adopted Trigger Value	Reliability/Comment
1,3-Dichloropropane	µg/L	1,100	unknown
TRH C6-C10 (F1)	µg/L	50	unknown
TRH >C10-C16 (F2)	µg/L	60	LOR
TRH >C16-C34 (F3)	µg/L	500	LOR
TRH >C34-C40 (F4)	µg/L	500	LOR
Naphthalene	µg/L	50	moderate
Phenanthrene	µg/L	0.6	unknown
Anthracene	µg/L	0.01	unknown
Fluoranthene	µg/L	1.0	unknown
Benzo(a)pyrene	µg/L	0.1	unknown
Arsenic	µg/L	13*	unknown
Cadmium, Cd	µg/L	0.7	very high
Chromium, Cr (VI)	µg/L	4.4	very high
Copper, Cu	µg/L	1.3	very high
Lead, Pb	µg/L	4.4	low
Nickel, Ni	µg/L	7	very high
Zinc, Zn	µg/L	15	moderate
Aluminium (pH>6.5)	µg/L	55*	unknown
Mercury	µg/L	0.1	very high
Sum of PFOS/PFHxS	µg/L	0.07	unknown
PFOA	µg/L	0.56	unknown
Fluoride	mg/L	15	Australian Drinking Water guideline x 10

4.4 Step 4 Define the Site Boundaries

The lateral extent of the site was defined as Lots 8 and 11 in Deposited Plan (DP) 270328 (as defined on the website maps.six.nsw.gov.au).

The vertical extent of assessment was defined as groundwater up to 2m below the apparent groundwater table.

This assessment was expected to take place within April 2021.

4.5 Step 5 Develop an Analytical Approach

The analytical approach will be as follows:

- DQIs will be applied as per Section 8.1. If the results of the analytical data validation are acceptable with respect to the DQIs, then the data will be deemed suitable for the purposes of this assessment; and
- Results from previously and newly installed groundwater monitoring wells will be assessed. If contaminant concentrations are less than the trigger values established in Section 4.3.1, or are considered to be comparable to regional values, then it will be considered that no groundwater-specific remediation is required. Otherwise, appropriate contingency measures will be assessed.

4.6 Step 6 Specify the Performance or Acceptance Criteria

The null hypothesis was that groundwater beneath the site has not been significantly contaminated by current and previous on and offsite activities.

Potential decision errors are considered to include:

- Sampling errors, which occur when collected samples are not representative of conditions within the investigation area; and
- Measurement errors, which occur during sample collection, handling, preparation, analysis and data production.

These errors may lead the decision maker to make the following errors:

- Deciding that the investigation area is suitable for industrial/commercial land use when it is actually not; and
- Deciding that the investigation area is not suitable for industrial/commercial land use when it actually is.

An assessment will be made as to the likelihood of a decision error being made based on the results of the QA/QC assessment, and the closeness of analytical results to the investigation criteria outlined in Section 4.3. It is considered that a margin for error is accounted for by the level of conservatism built into guideline trigger values.

4.7 Step 7 Optimise the Design for Obtaining Data

In order to optimise the quality of data collected, JME will use:

- Licensed drillers and experienced JME field staff to install wells and collect samples;
- Registered surveyors to survey the wells;
- Calibrated equipment to collect field data; and
- NATA-accredited laboratories. Laboratory analysis will be in accordance with the requirements of the NEPM (Schedule B3) and will be referenced to USEPA or APHA methods.

Details of sampling methods and analytical requirements are discussed in Section 5.

5 SAMPLING PLAN

5.1 Groundwater Assessment

In order to assess the contamination status of groundwater beneath the site, JME proposes to install three groundwater monitoring wells across the site – one up-gradient wells near the western boundary, and two down-gradient wells near the eastern boundary. JME will also utilise three existing wells used for the operational groundwater monitoring of the Midal Cables Facility. It is intended that the positioning of these wells will allow for:

- Assessment of groundwater gradient and flow direction;
- Comparison of the contamination status of groundwater entering and leaving site;
- Assessment of the impact of on-site contamination of groundwater;
- Comparison of current groundwater conditions with historic groundwater conditions; and
- Assessment of potential for off-site migration of groundwater to cause on-site contamination to impact a receiving body of water.

5.2 Installation of Wells

Boreholes will be drilled using a drilling rig fitted with hollow flight augers, and logged to record changes in lithology and sampling intervals. Particular note will be made of the base of fill, and depth at which groundwater is encountered, based on the driller's observations and visual observation of samples.

In each well, 3m of machine-slotted 50mm class 18 u-PVC screen will be installed over an interval from 2m below to 1m above the perceived top of groundwater. 50mm solid class 18 u-PVC casing will be installed from the top of the slotted screen to approximately 0.5m above the ground surface. The annulus around the casing will be filled with clean coarse sand and gravel to approximately 0.3m above the top of the slotted casing. Bentonite will be placed in the annulus above the sand, and protruding casing will be left in place as a standpipe.

Following installation, groundwater wells will be developed using a Typhoon™ submersible pump to surge the hole, and then to rapidly pump out accumulated groundwater. This procedure is designed to remove from the hole sediment and water stirred up during drilling operations. Prior to well development, any personnel handling decontaminated well development equipment that directly contacts bore water must wash their hands with plain soap and rinse thoroughly in tap water before donning a clean, new pair of disposable nitrile gloves. A new pair of nitrile gloves must be worn for each well developed.

5.3 Sampling Plan

Groundwater gauging and sampling collection will be conducted approximately one week after the installation of groundwater wells, to allow them to settle and equilibrate. Sampling will be conducted in accordance with the following protocols:

- Prior to purging, the presence or absence of phase separated hydrocarbons (PSH) and depth to groundwater will be measured using an oil-water interface probe;
- Prior to sampling, each well will be purged using a low flow peristaltic pump until uniform turbidity is (visually) obtained, and field water quality parameters (electrical conductivity (EC), pH and temperature) have stabilised to within 10% difference for three successive readings at least three minutes apart. If water quality parameters do not stabilise, groundwater will not be sampled until at least three times the volume of the sampling equipment has been purged; and
- Field measurements - pH, EC, temperature, dissolved oxygen (DO) and redox potential (Eh) – will be recorded during purging using equipment confirmed not to impact water quality.

Sampling QA/QC protocols are described in Section 8.

6 HEALTH, SAFETY AND THE ENVIRONMENT

6.1 Hazards and Control Measures

During drilling and sampling operations, there is potential for hazards to be encountered that present risks to health, safety and the environment (HSE). These risks will be addressed via the use of Safe Work Method Statements (SWMS), including considerations as detailed in Table 4.

TABLE 4: HSE HAZARDS and CONTROL MEASURES

Activity	Hazard	Control
Set up on site	Interaction with other site users	Sign onto site register
		Demarcate work area, exclusion zone
Drilling	Noise	Hearing protection
	Interaction with rig/excavator	Exclusion zone
		Communicate with operators
Excavation	Dust	Air fibre monitoring
		Dust masks
	Open excavations	Fence site
		Backfill as soon as practicable

	Interaction with rig/excavator	Exclusion zone
		Communicate with operators
Sampling	Sharp/abrasive fill	Neoprene gloves
	Contaminated fill/groundwater	Nitrile gloves
Asbestos assessment	Airborne asbestos fibres	Suit and mask

6.2 Personal Protective Equipment

Personal Protective Equipment (PPE) for the site will include:

- Hard hat;
- Safety glasses;
- Hi-visibility workwear;
- Long sleeves and trousers;
- Steel-capped boots;
- Chemical resistant rubber gloves (for persons coming in contact with soil/groundwater); and
- Dust resistant disposable overalls and P1 (minimum) dust masks (when handling potentially asbestos contaminated soil).

7 ANALYSIS PLAN

Groundwater samples will be analysed for the analytes listed in Table 3 above.

Primary and intra laboratory duplicate samples will be analysed by SGS Australia (SGS), Sydney. Laboratory analysis will be in accordance with the requirements of the NEPM (Schedule B3) and will be referenced to USEPA or APHA methods. Laboratory analytical methods are summarised in Table 5. Inter laboratory duplicate samples will be analysed by ALS Environmental (ALS) Sydney Laboratory. SGS and ALS are NATA accredited for the analysis to be undertaken.

TABLE 5: SUMMARY OF ANALYTICAL METHOD REFERENCES

Analysis	Medium	SGS Reference
TRH	Water	USEPA 5030B, 8020A, 8260, 3510B and 8015B
PAH	Water	USEPA 3500C and 8270D
Metals	Water	USEPA 6020A
Mercury	Water	APHA 3112 and 3500
VOC	Water	USEPA 5021A/8260 P&T/HS/GC/MS
PFAS	Water	In house LC-MS/MS
Fluoride	Water	APHA 4110 B

8 QUALITY ASSURANCE/QUALITY CONTROL PLAN

The QA/QC plan is designed to achieve predetermined DQIs that will demonstrate accuracy, precision, comparability, representativeness and completeness of the data generated.

8.1 Data Quality Indicators for the Project

DQIs for the project will be based on field and laboratory considerations in the table in Appendix V of the NSW Department of Environment and Conservation (DEC) Guidelines for the NSW Site Auditor Scheme (2nd Edition) Contaminated Sites. Specific DQIs for field and laboratory QA/QC samples are shown in Table 6.

TABLE 6: DATA QUALITY INDICATORS

Type of Quality Control Sample	Control Limit
Duplicate Samples	RPDs within 50% for analyte concentrations greater than 5 x LOR.
Rinsate Samples	Analytes not detected at concentrations greater than the blank water.
Laboratory Spikes	Laboratory spike acceptance limits are a “live” range and updated regularly. The laboratory acceptance limits at the time of analysis will be used.
Laboratory Blanks	Analytes not detected.

A review of the DQIs will be undertaken to assess the usability and representative nature of data generated from the project. The outcome of the DQI assessment will either:

- Recommend the data is suitable to be used for the project; or
- Limit the suitability of the data to be used, or
- Recommend further contamination/validation sampling.

8.2 Sampling Protocols

The following sampling protocols will be observed during the project:

- Dedicated sampling equipment (including the silicon tubing in the peristaltic pump) will be used for groundwater sample collection and will be changed between each sampling location.
- HDPE tubing will be used for groundwater sampling as it considered to present a lower risk of PFAS contamination of the samples.
- Groundwater samples will be collected in appropriate laboratory-supplied vessels;
- Samples will be placed on ice awaiting dispatch to the laboratory;
- Samples will be dispatched to the laboratory under chain of custody (CoC) conditions. CoC documentation will include:
 - sample identification of each sample;
 - date sampled; and
 - date dispatched to the laboratory; and
- Samples will be dispatched within three days of collection, to avoid holding time exceedances.

8.3 Field Quality Control Samples

The following quality control samples will be collected in the field:

- Intra and inter-laboratory duplicates will be collected at the rate of 1 per 20 primary samples collected; and
- A rinsate sample will be collected on every day that non-dedicated or non-disposable sampling equipment is utilised. Rinsate water will be deionised water purchased from a hardware store.
- Site tap water will be used for PFAS rinsate. The rinsate water will be tested before and after it is used.

8.4 Laboratory Quality Control

Laboratory quality control protocols will include the following:

- Laboratory analysis of samples will be undertaken by a NATA-accredited environmental testing laboratory;
- The laboratory will implement a quality control plan conforming to the NEPM Schedule B3 Guidelines for Analysis of Potentially Contaminated Soils;

- The laboratory will analyse reagent blanks, spike samples, duplicate spikes, matrix spikes, and surrogate spikes and duplicates to assess the laboratory's quality control; and
- The laboratory will extract and/or analyse the samples within the required holding times.

9 POST-ASSESSMENT ACTION PLAN

9.1 Data Assessment

Field observations, particularly those related to depths of groundwater and fill, will be used to revise the CSM as described in Section 2.

Analytical results will be compared with assessment and validation criteria as outlined in Section 4.3.1.

9.2 Requirement for Groundwater Remediation

The consideration that the leaching of contamination from fill on the site to groundwater or on site migration of contaminated groundwater, and subsequent off-site movement of contamination via groundwater migration, does not represent a significant risk of environmental impact will be considered to be supported if:

- Analytes are not detected at concentrations above the laboratory limit of reporting, or above the trigger values listed in Section 4.3.2; OR
- Groundwater contamination is found to be consistent with samples collected from nearby locations in the same historic land use setting; OR
- The primary source of groundwater contamination has been removed or will be managed/remediated.

In this case, it will be considered that site contamination is not being transported off-site via groundwater migration, and that no groundwater-specific remediation is required.

If field observations and analytical results indicate that contamination is being transported off-site via groundwater migration, the CSM and RAP will be revised.

10 GROUNDWATER ASSESSMENT

10.1 Field Work

Three groundwater monitoring wells (MW7 – MW9) were installed on 6 April 2021 and one groundwater monitoring well, MW10, was installed on 3 June by the FICO group, under the guidance of a JME environmental scientist. The wells were installed as per the requirements of the SAQP.

Construction details of monitoring wells are represented graphically in Appendix A.

Groundwater monitoring wells were left for at least a week to allow them to settle and equilibrate.

Groundwater gauging and sample collection from MW7 – MW9, plus pre-existing monitoring wells MW4-MW6, was conducted by a JME environmental scientist on 13 April 2021. Monitoring wells were sampled in accordance with the SAQP.

Following sampling monitoring wells MW7 and MW 8, a typhoon pump was placed down each well to maintain a constant groundwater head. The extracted water was collected in pre-weighed buckets over an 8-10 period. The time was kept with an iPhone stopwatch. The water

in the buckets was weighed on a top load balance. The groundwater head was measured using an interface probe.

Groundwater gauging and sample collection from MW4 – MW10, was conducted by a JME environmental scientist on 11 June 2021. Monitoring wells were sampled in accordance with the SAQP.

Groundwater depths and field parameters are recorded in Tables 7 and 8 (below).

10.2 Laboratory Analysis

Primary and inter duplicate and intra laboratory groundwater samples were analysed by SGS Australia (SGS), Sydney. The chain of custody did not direct SGS to forward the inter laboratory duplicate to ALS. This error was not noticed until after the analysis had been completed.

Samples were analysed for:

- PFAS (samples collected 13/4/2021 and 11/6/2021);
- Fluoride (samples collected 13/4/2021);
- Metals (Al, As, Cd, Cr, Cu, Ni, Pb, Zn, Hg) (samples collected 13/4/2021 and 11/6/2021);
- Volatile organic compounds (VOC) (samples collected 13/4/2021);
- PAH (samples collected 13/4/2021); and
- TRH (samples collected 13/4/2021).

10.3 Quality Assurance and Quality Control

Groundwater monitoring wells were installed by drillers licensed to install such wells, and experienced JME field staff.

The interface probe and water quality meter were hired from AirMet who deemed the equipment suitable for PFAS sampling and calibrated prior to use. Calibration certificates are attached in Appendix B.

Dedicated sampling equipment (excluding the flow cell) was used for groundwater sample collection and changed between each sampling location. The flow cell was purged between each sampling location, and not used during sample collection.

Groundwater samples were collected in appropriate laboratory-supplied vessels, kept on ice during transport, and received by the laboratory at a temperature of 3.1°C for the samples collected 13/4/2021 and 5°C for the samples collected 11/6/2021. Samples were transported under CoC conditions and received by the laboratory with sufficient time to undertake analyses within specified holding times.

During the assessment, field duplicate (QC1) and triplicate (QC1A) groundwater samples were collected and analysed to assess whether field sampling procedures provided reproducible results. The relative percentage difference (RPD) of analyte concentrations between duplicates and their primary sample were calculated to be within the acceptance criterion of 50% for concentrations greater than 5x the laboratory limit of reporting.

RPD results are included in Summary Table 3 (attached).

An equipment blank sample was not collected on 13/4/2021. A PFAS equipment rinsate was collected on 11/6/2021. Tap water was collected from site in a plastic bucket. A sample of the water was collected from the bucket (QCC). After sampling monitoring well MW9, the sampling train was placed in the bucket and the peristaltic pump was engaged. The sampling train was

flushed for two minutes. A rinsate sample (QCD) was collected from the peristaltic pump (See Plate 1). A number of PFAS substances were detected in both QCC and QCD at practically identical low concentrations. Hence it is considered unlikely that PFOA or PFOS were introduced by the sampling train. The source of these PFAS compounds was unknown.

It was assumed the water supplied from the onsite tap was from the Hunter Water reticulated water supply. Hunter Water routinely test the water supply for PFOA and PFOS+PFHxS. Typically, Hunter Water report the monthly average concentrations of PFOA as $<0.002\mu\text{g/L}$ and PFOS+PFHxS as $<0.004\mu\text{g/L}$ in the Grahamstown Zone. The monthly average for PFOS+PHxF in January 2021 was $0.004\mu\text{g/L}$ and the highest individual PFOS+PFHxS concentration was 0.005 from May 2020- May 2021. Hunter Waters reporting limit is higher than reporting supplied by the laboratory used in this assessment and Hunter Water do not report on the presence/absence of other PFAS compounds observed in samples QCC and QCD. The tap water being the source of the PFAS compounds observed in QCC and QCD. cannot be ruled out.

The monitoring wells were sampled using identical and dedicated HDPE tubing. The monitoring wells were sampled in the following order, MW7, MW8, MW6, MW9, MW10, MW5 and MW4. The two wells with the lowest PFAS concentrations were sampled in the middle of the sampling run indicating that cross contamination between sampling locations caused by the sampling method is unlikely.



Plate 1: Collecting rinsate sample QCD from monitoring well MW9 sampling train.

Groundwater quality assurance/quality control (QA/QC) results are presented in Summary Table 3 (attached).

SGS is National Association of Testing Authorities (NATA)-accredited for the analyses requested. SGS conducted internal quality control using spikes, laboratory duplicates and method blanks.

A review of SGS's Data Quality Objective (DQOs) for the analysis of soil samples indicated that DQOs were met, with the following exceptions:

- for samples collected 13/04/2021:
 - Surrogate analysis for PFAS in Aqueous Samples - Low Level for two items; and
 - Surrogate analysis for PAH in Water for two items.
- For samples collected 11/06/2021:
 - "Some surrogate recovery is outside of the acceptance criteria due to sample matrix interference".

It should be noted that the surrogate recovery for the PFAS compounds of interest were within Laboratory QA/QC documentation is included in Appendix C.

Based on a review of QA/QC results it is considered that analytical results are indicative of the contamination status of the site at the time of sampling.

10.4 Results

10.4.1 Field Observations

Groundwater field measurements are listed in Table 7 and Table 8, and borehole logs are included in Appendix A. Note Monitoring wells MW4, MW5 and MW6 were installed in 2012 by the same drilling company and environmental scientist, using the same method, who installed monitoring wells MW7-MW10.

TABLE 7: MONITORING WELL GROUNDWATER PROPERTIES 13 April 2021

Well	Top of Case Elevation (mAHD)	Groundwater Depth (mbTOC)	Calculated Groundwater Elevation (mAHD)	Dissolved Oxygen (ppm)	Electrical Conductivity (µS/cm)	pH	Redox Potential (mV)	Temperature (°C)
MW4	5.07	1.534	3.536	0.25	630	6.45	-149	23.5
MW5	5.19	1.636	3.554	0.98	617	6.78	-180	22.3
MW6	7.05	2.667	4.383	8.73	94.4	5.15	-118	20.9
MW7	6.04	2.199	3.841	2.02	244	5.96	-148	22.6
MW8	6.13	2.241	3.889	2.16	224	5.67	-150	22.5
MW9	7.22	2.904	4.316	2.45	200	5.73	-148	22.8

TABLE 8: MONITORING WELL GROUNDWATER PROPERTIES 11 June 2021

Well	Top of Case Elevation (mAHD)	Groundwater Depth (mbTOC)	Calculated Groundwater Elevation (mAHD)	Dissolved Oxygen (ppm)	Electrical Conductivity (µS/cm)	pH	Redox Potential (mV)	Temperature (°C)
MW4	5.07	1.882	3.188	0.16	360	6.32	-24.9	21.4
MW5	5.19	1.920	3.270	0.60	271	6.11	45.8	19.9
MW6	7.05	3.055	3.995	7.40	96.6	5.04	165.2	18.9
MW7	6.04	2.542	3.498	0.17	179	5.78	16.1	20.4
MW8	6.13	2.584	3.546	1.56	149.6	6.01	123	19.6
MW9	7.22	3.205	4.015	2.87	165.9	5.17	106	22.8
MW10	-	1.786	-	1.37	242	6.02	-44.2	19.5

The total depth of monitoring wells MW4 (4.223 mbTOC), MW5 (4mbTOC) and MW6 (5.1 mbTOC) were measured on 11/6/2021 indicating these wells have not silted up over time.

10.4.2 Groundwater Flow Direction Groundwater Gradient and Infiltration Rate

The tops of the casing of groundwater wells MW4 -MW9 were surveyed by registered surveyors DeWitt Consulting Pty Ltd. The survey results were combined with the depth to groundwater results obtained by JME to assess the altitude of the groundwater at each groundwater well location. Groundwater contours were generated using Surfer 13™. The groundwater contours indicate that the groundwater flows in a south south east direction. The groundwater contours are shown in Figure 3.

The groundwater gradient was estimated using the collected data for monitoring wells MW4 and MW9. Monitoring wells MW4 and MW9 are approximately 312m apart and the difference in the groundwater elevation is approximately 0.76m. Therefore, the hydraulic gradient is approximately 0.0024.

During the constant head test in monitoring well MW7, 64 kg (L) of water was collected in a ten-minute (600 second) period whilst maintaining a well head 0.112m below the standing groundwater level. Hence the inflow rate was 0.107 L/s

The slotted well casing in MW7 was set approximately 2.3m below the standing ground water level. The borehole annulus had a radius of 0.1m. Hence the area of the borehole annulus was 1.45m². Hence the flow rate of the aquifer at MW7 was approximately 0.074 L/s/m² or 7.4x10⁻⁵ m/s or 6.4 m/da.

During the constant head test in monitoring well MW8, 65 kg (L) of water was collected in an eight-minute (480 second) period whilst maintaining a well head 0.121m below the standing groundwater level. Hence the inflow rate was 0.135 L/s.

The slotted well casing in MW8 was set approximately 2.26m below the standing ground water level. The borehole annulus had a radius of 0.1m. Hence the area of the borehole annulus was 1.42m². Hence the flow rate of the aquifer at MW8 was approximately 0.095 L/s/m² or 9.5x10⁻⁵ m/s or 8.2 m/day.

The groundwater velocity can be calculated using the formula:

$$V=Kl/n$$

Where V is the groundwater velocity;

K is approximated by the aquifer flow rates derived from the field pump tests;

l is the hydraulic gradient calculated from field measurements; and

n is the effective porosity (or specific yield) which is typically 0.22 for sand.

Hence the groundwater velocity is estimated to be around 0.07- 0.09 m/day. Based on this estimate it would take approximately 13-17 years for the site groundwater to reach the nearest domestic groundwater well and 33-43 years for the site groundwater to reach the Hunter River.

10.4.3 Laboratory Analysis

Laboratory results from groundwater monitoring wells were compared with adopted DGVs (as developed in the SAQP). The comparison is summarised in Summary Table 2 (attached). Note that PFAS results were only tabulated if the analyte was detected above the laboratory LOR.

BTEX, TRH and PAH were not detected at concentrations above the laboratory LOR.

CHCs were not detected at concentrations above the laboratory LOR, with the exception of chloroform, which was detected in sample MW5 at a concentration significantly below the adopted DGV.

Several PFAS compounds were detected in the six samples collected on the 13/4/2021 and the seven samples collected on 11/6/2021. The PFAS fingerprint in the samples collected from MW4, MW5, MW7 and MW8 appeared similar in the makeup of compounds and their concentrations. PFOS was detected at concentrations above the NEMP2.0 99% ecological protection value for both monitoring rounds in monitoring wells MW4, MW5, MW7 and MW8 and in monitoring wells MW9 and MW10 in the second monitoring round. The sum of PFOS and PHxS exceeded the adopted DGV in MW4 in the second monitoring round. PFOA was detected at concentrations below the adopted DGV in monitoring wells MW4, MW5, MW7 and MW8. PFOA was not detected above the laboratory limit of report in monitoring wells MW6 and MW9.

Fluoride was detected below the adopted DGV in monitoring wells MW4, MW5, MW6, and MW9.

Arsenic, cadmium, nickel, lead and mercury were either not detected at concentrations above the laboratory LOR or detected in some wells above the laboratory detection limit but below the adopted DGVs.

The following metals were detected in some samples at concentrations which exceeded adopted guideline values:

- Aluminium was detected at concentrations significantly greater than the adopted DGV in the each of the monitoring wells sampled;
- Copper was detected in monitoring wells MW4, MW5 and MW7 in the first monitoring round;
- Chromium was detected in MW6 in both monitoring rounds; and
- Zinc was detected in monitoring wells MW4, MW7 and MW8 in the first monitoring round only and monitoring well MW5 in both monitoring wells.

Laboratory analytical reports are presented in Appendix C.

11 DISCUSSION

The site is situated in Tomago with the topography sloping downward from north northwest to a south southeast. The groundwater flows in a similar direction.

The site has had a two main industrial land use including sand mining and metal fabrication (steel and aluminium). A soil contamination assessment by JME indicated the site soil in the eastern portion of site was impacted with arsenic, copper, cadmium, lead and zinc. Lead exceeded the human health criteria whilst the remaining metals exceeded the ecological criteria. The RAP prepared by JME recommended the excavation and removal of the significant lead impacted areas with capping and stormwater management to mitigate potential offsite ecological impacts of arsenic, copper, cadmium and zinc.

The groundwater monitoring undertaken on 13 April 2021 was undertaken after a significant rainfall event in March 2021 where 459mm of rainfall was recorded at the Williamstown Base and another 40mm of rainfall was recorded on 8 April 2021. By comparison, 46.8mm of rainfall was recorded in the thirty days preceding the groundwater monitoring event on 11 June 2021. The difference in rainfall preceding the monitoring events had an expected effect on the groundwater depth which was higher on the 13 April across the wells monitored. Similarly with the historical electrical conductivity data displayed in Graphs 1-3, the electrical

conductivity of the two upgradient wells, MW6 and MW9, were relatively stable when compared to the remaining wells.

Groundwater monitoring indicated that the impact of arsenic, cadmium and copper in soil on the groundwater is negligible across both sampling rounds with the lower concentrations being observed in the second monitoring round. Cadmium has not exceeded the DGV in the samples in the recent monitoring rounds. Copper concentrations were slightly above the DGV in the first round, with no exceedances in the second monitoring round. Chromium slightly exceeded the DGV in both monitoring rounds. There were no exceedances of lead in either sampling rounds in the monitoring wells sampled.

Zinc was significantly elevated at MW7 with a concentration of 89 µg/L compared to trigger value of 15 µg/L in the first monitoring round and less than the trigger value with a concentration of 5µg/L in the second monitoring round. Monitoring well MW7 was in the vicinity, but down hydraulic gradient of, the highest soil zinc impacts reported in JME20005-2. It appears that the form of zinc present in the soil is more labile than the forms of the other metals that have impacted the soils in the vicinity of MW7. The difference in the zinc concentrations in the two monitoring rounds was likely to be caused by the 10-fold difference in rainfall in the thirty days leading up to the monitoring events. The highest zinc groundwater concentration, 220µg/L was detected in monitoring well MW10, located in Lot 11. It was reasonably assumed that a significant proportion of the surface soils were removed from Lot 11 and on this basis is expected that the zinc in this area would self attenuate.

The highest zinc soil impacts are associated with the highest lead soil impacts and, as such, are planned to be removed from the site or placed under a cap in the remediation process.

PFOA detections were significantly lower than the adopted human health trigger values and the NEMP2.0 99% ecological protection value. The PFOS+PFHxS concentration exceeded the adopted human health trigger by 20% in monitoring well MW4 in the second monitoring event and was below it the first monitoring event. The PFOS+PFHxS concentrations were below the adopted human health trigger in the remaining wells across both monitoring events. The concentration PFOS was detected in the downgradient wells were almost 30 times greater than the NEMP2.0 99% ecological protection value. Although the concentrations in the wells nearer to the Varley site are slightly higher and gradually diminish across the site, the concentrations of PFOS are similar enough in the PFAS impacted wells to consider its presence is unlikely to be caused by onsite migration from the neighbouring site. Therefore, it is considered possible that PFAS was either previously used on site or a significant (bush) fire threatened the site. Either way, the primary source has been removed from site and no significant PFAS soil concentrations (secondary source) were reported in JME2005-2, thus groundwater concentrations of PFAS should naturally attenuate with time. No PFOS was detected in the upgradient wells, MW6 and MW9.

It is difficult to assign trends in concentrations from 2 rounds of monitoring and its recommended that additional rounds of monitoring are undertaken to provide a better understanding of the background values. This will assist the assessment the remediation effort required to minimise the impact on offsite receptors in a sustainable fashion.

The site is within the TAC buffer zone. The TAC buffer zone is a special environment management zone and is define in the TAC conditions of consent and is derived from the ambient fluoride levels associated with TAC operations. Fluoride and aluminium concentrations were largest in the upgradient wells and appeared to diminish the further away from TAC the groundwater well was located. Aluminium concentrations were 160 times greater than the adopted trigger value in monitoring well MW9 and 129 greater in monitoring well

MW6. On this basis, aluminium is considered to be highest ecological risk to down gradient receptors.

No further action is required for fluoride and aluminium because these will continue to migrate onto site whilst the TAC smelter is still operable. The concentration of fluoride does exceed the drinking water guidelines in some wells and therefore the drinking of groundwater should be strictly prohibited on site.

12 CONCLUSION

JME considers that the elevated arsenic, cadmium, copper, lead and zinc concentrations in soil had not had a significant impact on the site's groundwater. It was noted that zinc was significantly elevated in a monitoring well, MW7, near the sites boundary following a significant rainfall event and was below the DGV in the second monitoring event. The zinc impacted soils with the highest concentrations are associated with the lead impacted soils that are planned to be removed along with the placement of a cap over a portion of site. The cap, in conjunction with a storm water system was intended to reduce stormwater percolation through the soil thereby reducing the metal leaching potential. PFAS concentrations were considered not to be risk to human health and would attenuate as there were no continuing sources.

On this basis, it considered that groundwater specific remediation is not required.

13 REFERENCES

Australian and New Zealand Water Quality Guideline website

JME20005-2 Detailed Contamination Assessment 21D and 21F School Drive Tomago, JM
Environments, June 2020

JME20005-3 Remedial Action Plan 21D and 21F School Drive Tomago revision 1, June 2020.

National Environment Protection (Assessment of Site Contamination) Measure (1999, updated
2013) Schedule B1, Guideline on Investigation Levels for Soil and Groundwater

National Environment Protection (Assessment of Site Contamination) Measure (1999, updated
2013) Schedule B2, Guideline on Site Characterisation

National Environment Protection (Assessment of Site Contamination) Measure (1999, updated
2013) 1999 Errata Updated 30 April 2014

NSW EPA (2017) Guidelines for the NSW Site Auditor Scheme (3rd Edition) Contaminated Sites

NSW Department of Environment and Conservation NSW (2007) Guidelines for the Assessment
and Management of Groundwater Contamination

NSW EPA (2020) Guidelines for Consultants Reporting on Contaminated Sites

Google Earth

PFAS National Environmental Management Plan January 2018, Heads of EPAs Australia and
New Zealand

maps.six.gov.nsw.au

14 LIMITATIONS

It is the nature of contaminated site investigations that the degree of variability in site conditions cannot be known completely, and no sampling and analysis program can eliminate all uncertainty concerning the condition of the site. Professional judgement must be exercised in the collection and interpretation of data.

In preparing this report, current guidelines for assessment and management of contaminated land were followed. This work has been conducted in good faith, in accordance with JME's understanding of the client's brief, and general accepted practice for environmental consulting.

This report was prepared for Remondis Australia Pty Ltd, with the objective of refining the understanding of contamination on the site that could potentially impact on the development of the property for use as apartments. No warranty, expressed or implied, is made as to the information and professional advice included in this report. This report is not intended for other parties or other uses, except for the purpose of assessing a Development Application for the site. Anyone using this document does so at their own risk, and should satisfy themselves concerning its applicability and, where necessary, should seek expert advice in relation to the particular situation at the time.

This report is only applicable for the site's proposed redevelopment. If the proposed redevelopment is altered, the report may have to be altered accordingly.

This report does not comprise a geotechnical assessment and should not be used for geotechnical purposes.

Figures



CLIENT: Remondis

PROJECT TITLE: School Drive, Tomago

PROJECT: JME20005

DWG #: 1

REVISION: 1

SCALE: NTS

DATE: 1/06/2021

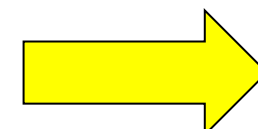
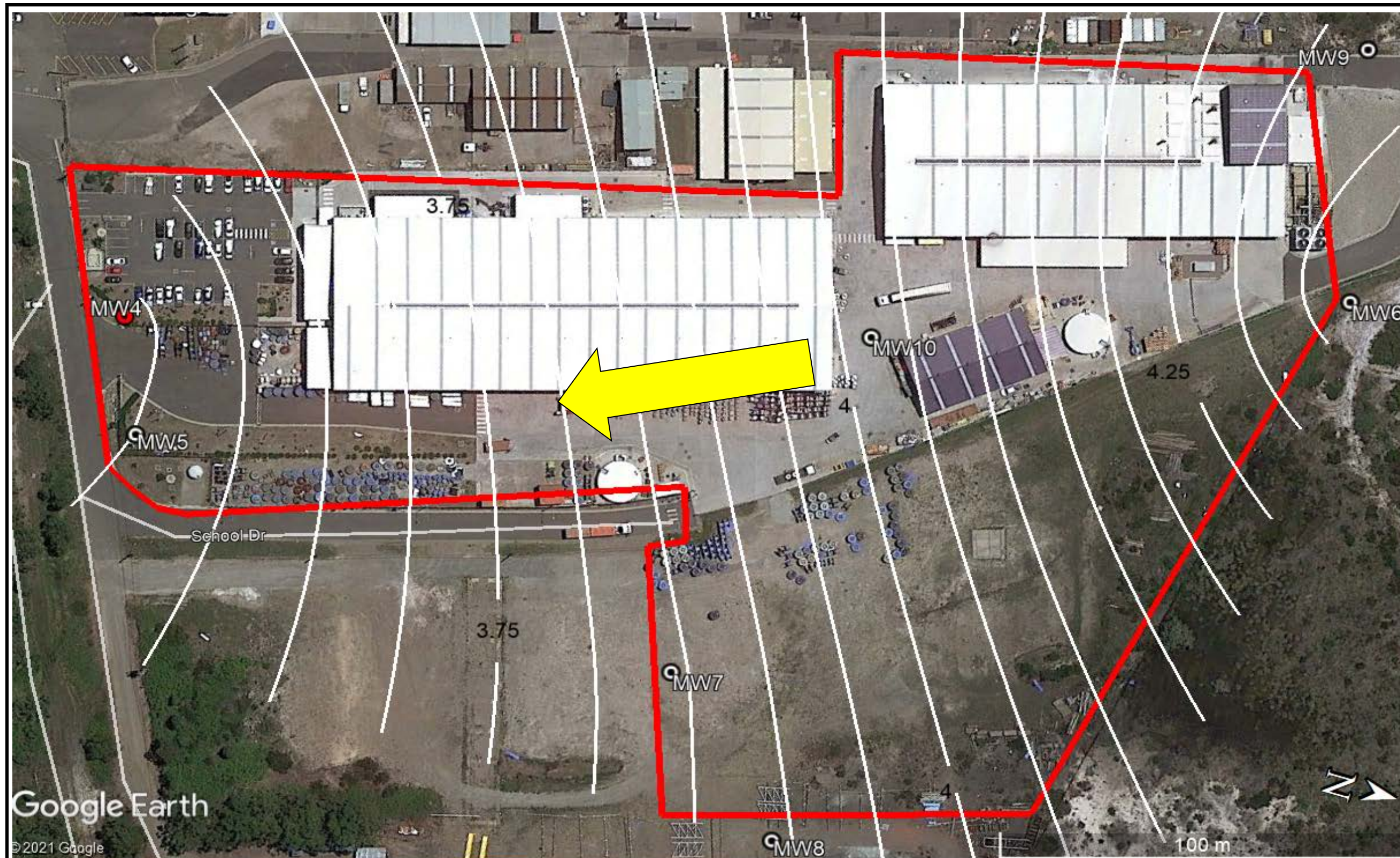
DESIGNED: JMc

DRAWN: JMc

STATUS: NFC

FIGURE TITLE:
Monitoring Well Locations

FIGURE NUMBER: 2



Inferred groundwater flow direction



CLIENT: Remondis

PROJECT TITLE: School Drive, Tomago

PROJECT: JME20005

DWG #: 1

REVISION: 1

SCALE: NTS

DATE: 28/04/2021

DESIGNED: JMc

DRAWN: JMc

STATUS:

NFC

FIGURE TITLE:

Groundwater Contours

FIGURE NUMBER: 3

Summary Tables



Summary Table 1

	TRH C6-C9	TRH C10-C36	Cl	SO4	NO3-N	Alkalinity	NH ₃ as N	NO ₂ as N	TKN	TN	TP	Ca	Mg	Na
	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	Monitoring Well MW4													
Min	<40	<450	15	20	0	10	0.035	0.007	0.62	0.62	0.03	0.6	1	21
Max	<40	<450	110	220	23	170	0.53	0.086	2.9	26	0.2	18	29	110
Mean	<40	<450	34	87	5	51	0.15	0.02	2	7	0.08	5	9	63
	Monitoring Well MW5													
Min	<40	<450	13	20	0	35	0.038	0.005	0.62	0.7	0.01	15	3.8	13
Max	<40	<450	82	110	19	240	12	0.27	13	23	0.24	68	29	89
Mean	<40	<450	38.5	66.5	5	102	2	0	4	8.916	0	32	14	52
	Monitoring Well MW6													
Min	<40	<450	10	14	0.55	<5	<0.005	<0.005	<0.05	0.67	<0.02	0.5	0.6	7.8
Max	<40	<450	13	21	2.6	7	0.14	0.007	1.3	2.8	0.22	1.2	1.1	11
Mean	<40	<450	11	17	1.3	<5	0.03	<0.005	0.3	1.6	0.08	0.8	0.7	9

	K	Al	As	Cd	Cr	Cu	Fe	Pb	Ni	Mn	Zn	Hg
	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
	Monitoring Well MW4											
Min	1.5	91	<1	<0.1	3	<1	75	<1	<1	8	34	<0.1
Max	4.2	2300	2	0.3	8	5	1100	<1	2	150	230	<0.1
Mean	2.6	1191	<1	<0.1	4	2	323	<1	<1	56	72	<0.1
	Monitoring Well MW5											
Min	1.7	450	<1	<0.1	3	1	57	<1	<1	20	5	<0.1
Max	5.5	2300	2	0.2	8	5	680	2	2	710	79	<0.1
Mean	3.4	1102.5	<1	<0.1	5	3	157	1	1	228	42	<0.1
	Monitoring Well MW6											
Min	0.2	4300	<1	<0.1	2	<1	5	<1	<1	6	5	<0.1
Max	0.4	7800	<1	0.4	5	3	390	<1	<1	21	11	0.2
Mean	0.3	5646	<1	<0.1	3	2	107	<1	<1	14	8	<0.1



Summary Table 2

Analyte Name	Units	Adopted	NEMP	Description	MW4	MW4	MW5	MW5	MW6	MW6	MW7	MW7	MW8	MW8	MW9	MW9	MW10
		Trigger	99%	Sample Date	13/4/2021	11/6/2021	13/4/2021	11/6/2021	13/4/2021	11/6/2021	13/4/2021	11/6/2021	13/4/2021	11/6/2021	13/4/2021	11/6/2021	11/6/2021
		Value	Ecological	Matrix	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
			Protection	Reporting Limit	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Vinyl chloride (Chloroethene)	µg/L	100		0.3	<0.3	N.A.	<0.3	N.A.	<0.3	N.A.	<0.3	N.A.	<0.3	N.A.	<0.3	N.A.	N.A.
1,1-dichloroethene	µg/L	700		0.5	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	N.A.
Chloroform (THM)	µg/L	370		0.5	<0.5	N.A.	0.9	N.A.	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	N.A.
1,2-dichloroethane	µg/L	1900		0.5	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	N.A.
1,1,1-trichloroethane	µg/L	270		0.5	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	N.A.
Benzene	µg/L	500		0.5	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	N.A.
1,2-dichloropropane	µg/L	900		0.5	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	N.A.
Trichloroethene (Trichloroethylene,TCE)	µg/L	330		0.5	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	N.A.
1,1,2-trichloroethane	µg/L	1900		0.5	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	N.A.
Toluene	µg/L	180		0.5	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	N.A.
1,3-dichloropropane	µg/L	1100		0.5	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	N.A.
Tetrachloroethene (Perchloroethylene,PCE)	µg/L	70		0.5	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	N.A.
m/p-xylene	µg/L	75		1	<1	N.A.	<1	N.A.	<1	N.A.	<1	N.A.	<1	N.A.	<1	N.A.	N.A.
1,1,2,2-tetrachloroethane	µg/L	400		0.5	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	N.A.
o-xylene	µg/L	350		0.5	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	<0.5	N.A.	N.A.
Total VOC	µg/L	-		10	<10	N.A.	<10	N.A.	<10	N.A.	<10	N.A.	<10	N.A.	<10	N.A.	N.A.
TRH C6-C10 (F1)	µg/L	50		50	<50	N.A.	<50	N.A.	<50	N.A.	<50	N.A.	<50	N.A.	<50	N.A.	N.A.
TRH >C10-C16 (F2)	µg/L	60		60	<60	N.A.	<60	N.A.	<60	N.A.	<60	N.A.	<60	N.A.	<60	N.A.	N.A.
TRH >C16-C34 (F3)	µg/L	500		500	<500	N.A.	<500	N.A.	<500	N.A.	<500	N.A.	<500	N.A.	<500	N.A.	N.A.
TRH >C34-C40 (F4)	µg/L	500		500	<500	N.A.	<500	N.A.	<500	N.A.	<500	N.A.	<500	N.A.	<500	N.A.	N.A.
Naphthalene	µg/L	50		0.1	<0.1	N.A.	<0.1	N.A.	<0.1	N.A.	<0.1	N.A.	<0.1	N.A.	<0.1	N.A.	N.A.
Phenanthrene	µg/L	0.6		0.1	<0.1	N.A.	<0.1	N.A.	<0.1	N.A.	<0.1	N.A.	<0.1	N.A.	<0.1	N.A.	N.A.
Anthracene	µg/L	0.01		0.1	<0.1	N.A.	<0.1	N.A.	<0.1	N.A.	<0.1	N.A.	<0.1	N.A.	<0.1	N.A.	N.A.
Fluoranthene	µg/L	1		0.1	<0.1	N.A.	<0.1	N.A.	<0.1	N.A.	<0.1	N.A.	<0.1	N.A.	<0.1	N.A.	N.A.
Benzo(a)pyrene	µg/L	0.1		0.1	<0.1	N.A.	<0.1	N.A.	<0.1	N.A.	<0.1	N.A.	<0.1	N.A.	<0.1	N.A.	N.A.
Fluortide	mg/L	15		0.1	4.6	N.A.	1.5	N.A.	8.7	N.A.	<0.1	N.A.	<0.1	N.A.	12	N.A.	N.A.
Aluminium	µg/L	55		5	770	N.A.	270	N.A.	7100	N.A.	250	N.A.	190	N.A.	8800	N.A.	N.A.
Arsenic, As	µg/L	13		1	2	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Cadmium, Cd	µg/L	0.7		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Copper, Cu	µg/L	1.3		1	3	1	3	<1	1	1	3	<1	<1	1	<1	<1	<1
Chromium, Cr	µg/L	4.4		1	3	2	3	3	6	8	4	3	3	2	3	3	3
Nickel, Ni	µg/L	7		1	2	<1	2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Lead, Pb	µg/L	4.4		1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Zinc, Zn	µg/L	15		5	34	12	33	17	6	<5	89	5	18	<5	<5	<5	220
Mercury	mg/L	0.0001		0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Perfluorobutanoic acid (PFBA)	µg/L	-	-	0.0005	0.020	0.035	0.022	0.007	<0.0005	<0.0005	0.0030	0.0014	<0.0005	0.001	<0.0005	<0.0001	0.0097
Perfluoropentanoic acid (PFPeA)	µg/L	-	-	0.0005	0.0079	0.014	0.0055	0.003	<0.0005	<0.0005	0.0034	0.0025	<0.0005	<0.0005	<0.0005	0.0006	0.0026
Perfluorohexanoic acid (PFHxA)	µg/L	-	-	0.0005	0.0095	0.016	0.0072	0.0065	<0.0005	0.0005	0.0048	0.0022	<0.0005	0.0007	<0.0005	<0.0005	0.0054
Perfluoroheptanoic acid (PFHpA)	µg/L	-	-	0.0005	0.0053	0.0081	0.0022	0.0044	<0.0005	0.0006	0.0014	0.0011	<0.0005	0.0005	<0.0005	<0.0005	0.0018
Perfluorooctanoic Acid (PFOA)	µg/L	0.56	19	0.0005	0.0067	0.016	0.0023	0.012	<0.0005	<0.0005	0.0052	0.0018	0.0031	0.010	<0.0005	<0.0005	0.018
Perfluorobutane sulfonate (PFBS)	µg/L	-	-	0.001	0.003	0.002	0.002	0.001	<0.001	<0.001	0.0010	0.003	0.002	0.001	<0.001	<0.001	0.001
Perfluoropentane sulfonate (PFPeS)	µg/L	-	-	0.001	0.003	0.002	0.002	<0.001	<0.001	<0.001	<0.001	0.001	0.002	<0.001	<0.001	<0.001	0.001
Perfluorohexane sulfonate (PFHxS)	µg/L	-	-	0.0002	0.028	0.068	0.015	0.027	0.0006	<0.0002	0.0043	0.021	0.023	0.026	0.0003	0.0005	0.034
Perfluoroheptane sulfonate (PFHpS)	µg/L	-	-	0.0002	0.0006	0.0003	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	0.0004	<0.0002	<0.0002	<0.0002	0.0008
Perfluorooctane sulfonate (PFOS)	µg/L		0.00023	0.0002	0.0063	0.016	0.0057	0.0071	<0.0002	<0.0002	0.0043	0.0081	0.0040	0.011	<0.0002	0.0007	0.026
Sum of PFHxS and PFOS	µg/L	0.07			0.0343	0.084	0.0207	0.0341	0.0006	<0.0002	0.0086	0.0291	0.0270	0.037	0.0003	0.0012	0.06
1H,1H,2H,2H-Perfluorooctane sulfonate (6:2) (6:2 FTS)	µg/L			0.0005	<0.0005	<0.0005	0.0050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

exceeds NEMP 2.0 Ecological DGV

exceeds adopted DGV by <250%

exceeds adopted DGV by >250%



Summary Table 3

Analyte Name	Units	Description	MW4	QC2	Relative	QC2A	Relative	MW7	QC1	Relative	QC1A	Relative	QCC	QCD
		Sample Date	11/6/2021	11/6/2021	percentage	11/6/2021	percentage	13/4/2021	13/4/2021	percentage	13/4/2021	percentage	11/6/2021	11/6/2021
		Matrix	Water	Water	difference	Water	difference	Water	Water	difference	Water	difference	Water	Water
		Reporting Limit	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Vinyl chloride (Chloroethene)	µg/L	0.3	N.A.	N.A.	N.A.	N.A.	N.A.	<0.3	<0.3	0%	<0.3	0%	N.A.	N.A.
1,1-dichloroethene	µg/L	0.5	N.A.	N.A.	N.A.	N.A.	N.A.	<0.5	<0.5	0%	<0.5	0%	N.A.	N.A.
Chloroform (THM)	µg/L	0.5	N.A.	N.A.	N.A.	N.A.	N.A.	<0.5	<0.5	0%	<0.5	0%	N.A.	N.A.
1,2-dichloroethane	µg/L	0.5	N.A.	N.A.	N.A.	N.A.	N.A.	<0.5	<0.5	0%	<0.5	0%	N.A.	N.A.
1,1,1-trichloroethane	µg/L	0.5	N.A.	N.A.	N.A.	N.A.	N.A.	<0.5	<0.5	0%	<0.5	0%	N.A.	N.A.
Benzene	µg/L	0.5	N.A.	N.A.	N.A.	N.A.	N.A.	<0.5	<0.5	0%	<0.5	0%	N.A.	N.A.
1,2-dichloropropane	µg/L	0.5	N.A.	N.A.	N.A.	N.A.	N.A.	<0.5	<0.5	0%	<0.5	0%	N.A.	N.A.
Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	N.A.	N.A.	N.A.	N.A.	N.A.	<0.5	<0.5	0%	<0.5	0%	N.A.	N.A.
1,1,2-trichloroethane	µg/L	0.5	N.A.	N.A.	N.A.	N.A.	N.A.	<0.5	<0.5	0%	<0.5	0%	N.A.	N.A.
Toluene	µg/L	0.5	N.A.	N.A.	N.A.	N.A.	N.A.	<0.5	<0.5	0%	<0.5	0%	N.A.	N.A.
1,3-dichloropropane	µg/L	0.5	N.A.	N.A.	N.A.	N.A.	N.A.	<0.5	<0.5	0%	<0.5	0%	N.A.	N.A.
Tetrachloroethene (Perchloroethylene,PCE)	µg/L	0.5	N.A.	N.A.	N.A.	N.A.	N.A.	<0.5	<0.5	0%	<0.5	0%	N.A.	N.A.
m/p-xylene	µg/L	1	N.A.	N.A.	N.A.	N.A.	N.A.	<1	<1	0%	<1	0%	N.A.	N.A.
1,1,2,2-tetrachloroethane	µg/L	0.5	N.A.	N.A.	N.A.	N.A.	N.A.	<0.5	<0.5	0%	<0.5	0%	N.A.	N.A.
o-xylene	µg/L	0.5	N.A.	N.A.	N.A.	N.A.	N.A.	<0.5	<0.5	0%	<0.5	0%	N.A.	N.A.
Total VOC	µg/L	10	N.A.	N.A.	N.A.	N.A.	N.A.	<10	<10	0%	<10	0%	N.A.	N.A.
TRH C6-C10 (F1)	µg/L	50	N.A.	N.A.	N.A.	N.A.	N.A.	<50	<50	0%	<50	0%	N.A.	N.A.
TRH >C10-C16 (F2)	µg/L	60	N.A.	N.A.	N.A.	N.A.	N.A.	<60	<60	0%	<60	0%	N.A.	N.A.
TRH >C16-C34 (F3)	µg/L	500	N.A.	N.A.	N.A.	N.A.	N.A.	<500	<500	0%	<500	0%	N.A.	N.A.
TRH >C34-C40 (F4)	µg/L	500	N.A.	N.A.	N.A.	N.A.	N.A.	<500	<500	0%	<500	0%	N.A.	N.A.
Naphthalene	µg/L	0.1	N.A.	N.A.	N.A.	N.A.	N.A.	<0.1	<0.1	0%	<0.1	0%	N.A.	N.A.
Phenanthrene	µg/L	0.1	N.A.	N.A.	N.A.	N.A.	N.A.	<0.1	<0.1	0%	<0.1	0%	N.A.	N.A.
Anthracene	µg/L	0.1	N.A.	N.A.	N.A.	N.A.	N.A.	<0.1	<0.1	0%	<0.1	0%	N.A.	N.A.
Fluoranthene	µg/L	0.1	N.A.	N.A.	N.A.	N.A.	N.A.	<0.1	<0.1	0%	<0.1	0%	N.A.	N.A.
Benzo(a)pyrene	µg/L	0.1	N.A.	N.A.	N.A.	N.A.	N.A.	<0.1	<0.1	0%	<0.1	0%	N.A.	N.A.
Fluortide	mg/L	0.1	N.A.	N.A.	N.A.	N.A.	N.A.	<0.1	<0.1	0%	0.15	40%	N.A.	N.A.
Aluminium	µg/L	5	N.A.	N.A.	N.A.	N.A.	N.A.	250	260	4%	240	4%	N.A.	N.A.
Arsenic, As	µg/L	1	1	N.A.	N.A.	<1	0%	<1	<1	0%	<1	0%	N.A.	N.A.
Cadmium, Cd	µg/L	0.1	<0.1	N.A.	N.A.	<0.1	0%	<0.1	<0.1	0%	<0.1	0%	N.A.	N.A.
Copper, Cu	µg/L	1	1	N.A.	N.A.	<1	0%	3	2	40%	<1	100%	N.A.	N.A.
Chromium, Cr	µg/L	1	2	N.A.	N.A.	2	0%	4	4	0%	4	0%	N.A.	N.A.
Nickel, Ni	µg/L	1	<1	N.A.	N.A.	<1	0%	<1	<1	0%	<1	0%	N.A.	N.A.
Lead, Pb	µg/L	1	<1	N.A.	N.A.	<1	0%	<1	<1	0%	<1	0%	N.A.	N.A.
Zinc, Zn	µg/L	5	12	N.A.	N.A.	7	53%	89	83	7%	77	14%	N.A.	N.A.
Mercury	mg/L	0.0001	<0.0001	N.A.	N.A.	<0.0001	0%	<0.0001	<0.0001	0%	<0.0001	0%	N.A.	N.A.
Perfluorobutanoic acid (PFBA)	µg/L	0.0005	0.035	0.033	6%	<0.1	N.A.	0.0030	0.0024	22%	0.0021	35%	0.0011	0.0013
Perfluoropentanoic acid (PFPeA)	µg/L	0.0005	0.014	0.013	7%	<0.02	N.A.	0.0034	0.0023	39%	0.0021	47%	0.0016	0.0016
Perfluorohexanoic acid (PFHxA)	µg/L	0.0005	0.016	0.014	13%	<0.02	N.A.	0.0048	0.0039	21%	0.0036	29%	0.001	0.001
Perfluoroheptanoic acid (PFHpA)	µg/L	0.0005	0.0081	0.0086	6%	<0.02	N.A.	0.0014	0.0020	35%	0.0015	7%	0.0006	<0.0005
Perfluorooctanoic Acid (PFOA)	µg/L	0.0005	0.016	0.017	6%	<0.01	N.A.	0.0052	0.0040	26%	0.0045	14%	0.0005	0.0012
Perfluorobutane sulfonate (PFBS)	µg/L	0.001	0.002	0.002	0%	<0.02	N.A.	0.001	0.001	0%	0.001	0%	<0.001	<0.001
Perfluoropentane sulfonate (PFPeS)	µg/L	0.001	0.002	0.002	0%	<0.02	N.A.	<0.001	<0.001	0%	<0.001	0%	<0.001	<0.001
Perfluorohexane sulfonate (PFHxS)	µg/L	0.0002	0.068	0.058	16%	0.04	52%	0.0043	0.0033	26%	0.0042	2%	0.0017	0.0014
Perfluoroheptane sulfonate (PFHpS)	µg/L	0.0002	0.0003	0.0003	0%	<0.02	N.A.	0.0002	<0.0002	0%	<0.0002	0%	<0.0002	<0.0002
Perfluorooctane sulfonate (PFOS)	µg/L	0.0002	0.016	0.020	22%	0.01	46%	0.0043	0.0030	36%	0.0038	12%	0.0017	0.0018
Sum of PFHxS and PFOS	µg/L		0.0840	0.0780	7%	0.05	51%	0.0086	0.0063	31%	0.0080	7%	0.0034	0.0032
1H,1H,2H,2H-Perfluorooctane sulfonate (6:2) (6:2 FTS)	µg/L	0.0005	<0.0005	<0.0005	0%	<0.05	N.A.	<0.0005	<0.0005	0%	<0.0005	0%	<0.0005	<0.0005

Appendix A

Borehole Logs

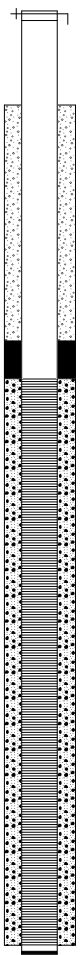
MONITORING WELL LOG: MW7

SHEET 1 of 1

PROJECT No: JME20005
SITE: 21F School Drive Tomago
CLIENT: Remondis
CONTRACTOR: FICO Group

DATE: 6 April 2021
LOGGED BY: J.McMahon
TOTAL DEPTH: 4.5
DRILLER: Sean Curry

EASTING: 381109.61
NORTHING: 6367238.55
CASING HEIGHT: 0.5m
DRILLING METHOD: Hollow Flight Auger

DEPTH (m)	WELL CONSTRUCTION	LEGEND	DESCRIPTION	ODOUR	PID (ppmv)	SAMPLE LABEL	REMARKS
							
			Ground Surface				
			Fill: grey brown SAND with some gravel				
1			Light brown SAND. Potential sand mining tailings?				
2							
3							
4							
5							
6							

NOTES

Descriptions are based on observations and hand testing of grab samples. Mechanical Tests were not performed unless otherwise stated.

First Occurrence of Groundwater: 1.8 mbgs

Static Groundwater Level: 2.199 mbtoc 13/04/2021

Reviewed By: JMc

FILE

MONITORING WELL LOG: MW8

SHEET 1 of 1

PROJECT No: JME20005
SITE: 21F School Drive Tomago
CLIENT: Remondis
CONTRACTOR: FICO Group

DATE: 6 April 2021
LOGGED BY: J.McMahon
TOTAL DEPTH: 4.5
DRILLER: Sean Curry

EASTING: 381144.77
NORTHING: 6367275.03
CASING HEIGHT: 0.5m
DRILLING METHOD: Hollow Flight Auger

DEPTH (m)	WELL CONSTRUCTION	LEGEND	DESCRIPTION	ODOUR	PID (ppmv)	SAMPLE LABEL	REMARKS
			Ground Surface				
1			Fill: dark gray SAND, with gravel and cobbles				
2			Light brown SAND. Potential sand mining tailings?				
3							
4							
5							
6							

NOTES

Descriptions are based on observations and hand testing of grab samples. Mechanical Tests were not performed unless otherwise stated.

First Occurrence of Groundwater: 1.8 mbgs

Static Groundwater Level: 2.241 mbtoc 13/04/2021

Reviewed By: JMc

FILE

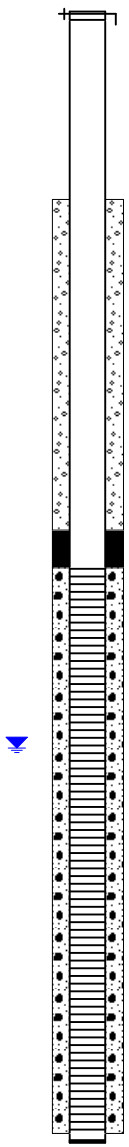
MONITORING WELL LOG: MW9

SHEET 1 of 1

PROJECT No: JME20005
SITE: 21D School Drive Tomago
CLIENT: Remondis
CONTRACTOR: FICO Group

DATE: 6 April 2021
LOGGED BY: J.McMahon
TOTAL DEPTH: 5
DRILLER: Sean Curry

EASTING: 380900.99
NORTHING: 6367351.91
CASING HEIGHT: 1m
DRILLING METHOD: Hollow Flight Auger

DEPTH (m)	WELL CONSTRUCTION	LEGEND	DESCRIPTION	ODOUR	PID (ppmv)	SAMPLE LABEL	REMARKS
0			Ground Surface				
			Fill: Gravels and sand				
			Fill: grey brown SAND				
1			Light brown SAND. Potential sand mining tailings?				
2							
3							
4							
5							

NOTES

Descriptions are based on observations and hand testing of grab samples. Mechanical Tests were not performed unless otherwise stated.

First Occurrence of Groundwater: 2 mbgs

Static Groundwater Level: 2.904 mbtoc 13/04/2021

Reviewed By: JMc

FILE

MONITORING WELL LOG: MW10

SHEET 1 of 1

PROJECT No: JME20005
SITE: 21D School Drive Tomago
CLIENT: Remondis
CONTRACTOR: FICO Group

DATE: 3 June 2021
LOGGED BY: J.McMahon
TOTAL DEPTH: 4
DRILLER: Sean Curry

EASTING: 381010
NORTHING: 6367258
CASING HEIGHT: 0m
DRILLING METHOD: Solid Flight Auger

DEPTH (m)	WELL CONSTRUCTION	LEGEND	DESCRIPTION	ODOUR	PID (ppmv)	SAMPLE LABEL	REMARKS
			Ground Surface				
			Concrete			MW10-1	
			Fill: grey brown SAND			MW10-2	
1							
			Light brown SAND. Potential sand mining tailings?				MW10 was drilled three times. First two times the auger was refused on large ballast
2						MW10-3	
3							
4							
5							
6							

NOTES

Descriptions are based on observations and hand testing of grab samples. Mechanical Tests were not performed unless otherwise stated.

First Occurrence of Groundwater: 2 mbgs

Static Groundwater Level: 2.904 mbtoc 13/04/2021

Reviewed By: JMc

FILE

Appendix B

Calibration Certificates

Multi Parameter Water Meter

Instrument **YSI Quatro Pro Plus**
 Serial No. **10E101052**



airmet
 Air-Met Scientific Pty Ltd
 1300 137 067

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

Certificate of Calibration

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

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 10.00		pH 10.00		355386	pH 9.98
2. pH 7.00		pH 7.00		355072	pH 7.04
3. pH 4.00		pH 4.00		351412	pH 4.03
4. mV		227.4mV		357172/357173	227.5 mV
5. EC		2.76mS		350510	2.76mS
6. D.O		0.00ppm		10959	0.03ppm
7. Temp		23.1°C		MultiTherm	22.2°C

Calibrated by:

Eloise Carroll

Calibration date:

9/04/2021

Next calibration due:

9/05/2021

Multi Parameter Water Meter



airmet

Air-Met Scientific Pty Ltd
1300 137 067

Instrument **YSI Quatro Pro Plus**
Serial No. **18G103299**

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

Certificate of Calibration

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

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 10.00		pH 10.00		355386	pH 9.96
2. pH 7.00		pH 7.00		360390	pH 7.08
3. pH 4.00		pH 4.00		367234	pH 4.20
4. mV		231.8mV		364217/358634	234.0mV
5. EC		2.76mS		350510	2.75mS
6. D.O		0.00ppm		10959	0.01ppm
7. Temp		21.5°C		MultiTherm	20.8°C

Calibrated by:

Lauren Tompkins

Calibration date:

1/06/2021

Next calibration due:

1/07/2021

Appendix B

Laboratory Documents



SAMPLE RECEIPT ADVICE

SE218617

CLIENT DETAILS

Contact James McMahon
Client JM ENVIRONMENTS
Address 37 TOOKE STREET
COOKS HILL NSW 2300

Telephone 0427 893 668
Facsimile (Not specified)
Email james@jmenvironments.com

Project JME20006
Order Number JME20006
Samples 8

LABORATORY DETAILS

Manager Huong Crawford
Laboratory SGS Alexandria Environmental
Address Unit 16, 33 Maddox St
Alexandria NSW 2015

Telephone +61 2 8594 0400
Facsimile +61 2 8594 0499
Email au.environmental.sydney@sgs.com

Samples Received Thu 15/4/2021
Report Due Wed 21/4/2021
SGS Reference SE218617

SUBMISSION DETAILS

This is to confirm that 8 samples were received on Thursday 15/4/2021. Results are expected to be ready by COB Wednesday 21/4/2021. Please quote SGS reference SE218617 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice
Samples received in correct containers	Yes	Sample counts by matrix	8 Water
Date documentation received	15/4/2021	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	3.1°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

Unless otherwise instructed, water and bulk samples will be held for one month from date of report, and soil samples will be held for two months.

COMMENTS

PFAS subcontracted to SGS Melbourne, 10/585 Blackburn Road, Notting Hill, VIC, NATA Accreditation Numbe. 2562/14420.

This document is issued by the Company under its General Conditions of Service accessible at www.sgs.com/en/Terms-and-Conditions.aspx. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.



SAMPLE RECEIPT ADVICE

SE218617

CLIENT DETAILS

Client **JM ENVIRONMENTS**

Project **JME20006**

SUMMARY OF ANALYSIS

No.	Sample ID	Anions by Ion Chromatography in Water	Mercury (dissolved) in Water	PAH (Polynuclear Aromatic Hydrocarbons) in Water	Trace Metals (Dissolved) in Water by ICPMS	TRH (Total Recoverable Hydrocarbons) in Water	VOCs in Water	Volatile Petroleum Hydrocarbons in Water
001	MW4	1	1	22	7	9	78	7
002	MW5	1	1	22	7	9	78	7
003	MW6	1	1	22	7	9	78	7
004	MW7	1	1	22	7	9	78	7
005	MW8	1	1	22	7	9	78	7
006	MW9	1	1	22	7	9	78	7
007	QC1	1	1	22	7	9	78	7
008	QC1A	1	1	22	7	9	78	7

CONTINUED OVERLEAF

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .



SAMPLE RECEIPT ADVICE

SE218617

CLIENT DETAILS

Client **JM ENVIRONMENTS**

Project **JME20006**

SUMMARY OF ANALYSIS

No.	Sample ID	Per- and Polyfluoroalkyl Substances (PFAS) in
001	MW4	55
002	MW5	55
003	MW6	55
004	MW7	55
005	MW8	55
006	MW9	55
007	QC1	55
008	QC1A	55

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

CLIENT DETAILS

Contact James McMahon
Client JM ENVIRONMENTS
Address 37 TOOKE STREET
COOKS HILL NSW 2300

Telephone 0427 893 668
Facsimile (Not specified)
Email james@jmenvironments.com

Project JME20006
Order Number JME20006
Samples 8

LABORATORY DETAILS

Manager Huong Crawford
Laboratory SGS Alexandria Environmental
Address Unit 16, 33 Maddox St
Alexandria NSW 2015

Telephone +61 2 8594 0400
Facsimile +61 2 8594 0499
Email au.environmental.sydney@sgs.com

SGS Reference SE218617 R0
Date Received 15/4/2021
Date Reported 22/4/2021

COMMENTS

Accredited for compliance with ISO/IEC 17025 - Testing. NATA accredited laboratory 2562(4354).

PFAS subcontracted to SGS Melbourne, 10/585 Blackburn Road, Notting Hill, VIC, NATA Accreditation Numbe. 2562/14420. Report Numbers ME319993 & ME319993A

MA1523: Some PFAS surrogate recovery values are out of acceptance range due to matrix interference

SIGNATORIES



Dong LIANG
Metals/Inorganics Team Leader



Ly Kim HA
Organic Section Head



Shane MCDERMOTT
Inorganic/Metals Chemist

VOCs in Water [AN433] Tested: 20/4/2021

PARAMETER	UOM	LOR	MW4	MW5	MW6	MW7	MW8
			WATER - 13/4/2021 SE218617.001	WATER - 13/4/2021 SE218617.002	WATER - 13/4/2021 SE218617.003	WATER - 13/4/2021 SE218617.004	WATER - 13/4/2021 SE218617.005
Dichlorodifluoromethane (CFC-12)	µg/L	5	<5	<5	<5	<5	<5
Chloromethane	µg/L	5	<5	<5	<5	<5	<5
Vinyl chloride (Chloroethene)	µg/L	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Bromomethane	µg/L	10	<10	<10	<10	<10	<10
Chloroethane	µg/L	5	<5	<5	<5	<5	<5
Trichlorofluoromethane	µg/L	1	<1	<1	<1	<1	<1
Acetone (2-propanone)	µg/L	10	<10	<10	<10	<10	<10
Iodomethane	µg/L	5	<5	<5	<5	<5	<5
1,1-dichloroethene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acrylonitrile	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dichloromethane (Methylene chloride)	µg/L	5	<5	<5	<5	<5	<5
Allyl chloride	µg/L	2	<2	<2	<2	<2	<2
Carbon disulfide	µg/L	2	<2	<2	<2	<2	<2
trans-1,2-dichloroethene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MtBE (Methyl-tert-butyl ether)	µg/L	2	<2	<2	<2	<2	<2
1,1-dichloroethane	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Vinyl acetate	µg/L	10	<10	<10	<10	<10	<10
MEK (2-butanone)	µg/L	10	<10	<10	<10	<10	<10
cis-1,2-dichloroethene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromochloromethane	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroform (THM)	µg/L	0.5	<0.5	0.9	<0.5	<0.5	<0.5
2,2-dichloropropane	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-dichloroethane	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-trichloroethane	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-dichloropropene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Carbon tetrachloride	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-dichloropropane	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2-nitropropane	µg/L	100	<100	<100	<100	<100	<100
Bromodichloromethane (THM)	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MIBK (4-methyl-2-pentanone)	µg/L	5	<5	<5	<5	<5	<5
cis-1,3-dichloropropene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,3-dichloropropene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-trichloroethane	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,3-dichloropropane	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane (THM)	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2-hexanone (MBK)	µg/L	5	<5	<5	<5	<5	<5
1,2-dibromoethane (EDB)	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethene (Perchloroethylene,PCE)	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1,2-tetrachloroethane	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chlorobenzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform (THM)	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
m/p-xylene	µg/L	1	<1	<1	<1	<1	<1
cis-1,4-dichloro-2-butene	µg/L	1	<1	<1	<1	<1	<1
Styrene (Vinyl benzene)	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2-tetrachloroethane	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
o-xylene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Xylenes	µg/L	1.5	<1.5	<1.5	<1.5	<1.5	<1.5
1,2,3-trichloropropane	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,4-dichloro-2-butene	µg/L	1	<1	<1	<1	<1	<1
Isopropylbenzene (Cumene)	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromobenzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5

VOCs in Water [AN433] Tested: 20/4/2021 (continued)

PARAMETER	UOM	LOR	MW4	MW5	MW6	MW7	MW8
			WATER	WATER	WATER	WATER	WATER
			13/4/2021 SE218617.001	13/4/2021 SE218617.002	13/4/2021 SE218617.003	13/4/2021 SE218617.004	13/4/2021 SE218617.005
n-propylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2-chlorotoluene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
4-chlorotoluene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,3,5-trimethylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
tert-butylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2,4-trimethylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
sec-butylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,3-dichlorobenzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,4-dichlorobenzene	µg/L	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
p-isopropyltoluene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-dichlorobenzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
n-butylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-dibromo-3-chloropropane	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2,4-trichlorobenzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Hexachlorobutadiene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2,3-trichlorobenzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total BTEX	µg/L	3	<3	<3	<3	<3	<3
Total VOC	µg/L	10	<10	<10	<10	<10	<10

VOCs in Water [AN433] Tested: 20/4/2021 (continued)

PARAMETER	UOM	LOR	MW9	QC1	QC1A
			WATER - 13/4/2021 SE218617.006	WATER - 13/4/2021 SE218617.007	WATER - 13/4/2021 SE218617.008
Dichlorodifluoromethane (CFC-12)	µg/L	5	<5	<5	<5
Chloromethane	µg/L	5	<5	<5	<5
Vinyl chloride (Chloroethene)	µg/L	0.3	<0.3	<0.3	<0.3
Bromomethane	µg/L	10	<10	<10	<10
Chloroethane	µg/L	5	<5	<5	<5
Trichlorofluoromethane	µg/L	1	<1	<1	<1
Acetone (2-propanone)	µg/L	10	<10	<10	<10
Iodomethane	µg/L	5	<5	<5	<5
1,1-dichloroethene	µg/L	0.5	<0.5	<0.5	<0.5
Acrylonitrile	µg/L	0.5	<0.5	<0.5	<0.5
Dichloromethane (Methylene chloride)	µg/L	5	<5	<5	<5
Allyl chloride	µg/L	2	<2	<2	<2
Carbon disulfide	µg/L	2	<2	<2	<2
trans-1,2-dichloroethene	µg/L	0.5	<0.5	<0.5	<0.5
MtBE (Methyl-tert-butyl ether)	µg/L	2	<2	<2	<2
1,1-dichloroethane	µg/L	0.5	<0.5	<0.5	<0.5
Vinyl acetate	µg/L	10	<10	<10	<10
MEK (2-butanone)	µg/L	10	<10	<10	<10
cis-1,2-dichloroethene	µg/L	0.5	<0.5	<0.5	<0.5
Bromochloromethane	µg/L	0.5	<0.5	<0.5	<0.5
Chloroform (THM)	µg/L	0.5	<0.5	<0.5	<0.5
2,2-dichloropropane	µg/L	0.5	<0.5	<0.5	<0.5
1,2-dichloroethane	µg/L	0.5	<0.5	<0.5	<0.5
1,1,1-trichloroethane	µg/L	0.5	<0.5	<0.5	<0.5
1,1-dichloropropene	µg/L	0.5	<0.5	<0.5	<0.5
Carbon tetrachloride	µg/L	0.5	<0.5	<0.5	<0.5
Benzene	µg/L	0.5	<0.5	<0.5	<0.5
Dibromomethane	µg/L	0.5	<0.5	<0.5	<0.5
1,2-dichloropropane	µg/L	0.5	<0.5	<0.5	<0.5
Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	<0.5	<0.5	<0.5
2-nitropropane	µg/L	100	<100	<100	<100
Bromodichloromethane (THM)	µg/L	0.5	<0.5	<0.5	<0.5
MIBK (4-methyl-2-pentanone)	µg/L	5	<5	<5	<5
cis-1,3-dichloropropene	µg/L	0.5	<0.5	<0.5	<0.5
trans-1,3-dichloropropene	µg/L	0.5	<0.5	<0.5	<0.5
1,1,2-trichloroethane	µg/L	0.5	<0.5	<0.5	<0.5
Toluene	µg/L	0.5	<0.5	<0.5	<0.5
1,3-dichloropropane	µg/L	0.5	<0.5	<0.5	<0.5
Dibromochloromethane (THM)	µg/L	0.5	<0.5	<0.5	<0.5
2-hexanone (MBK)	µg/L	5	<5	<5	<5
1,2-dibromoethane (EDB)	µg/L	0.5	<0.5	<0.5	<0.5
Tetrachloroethene (Perchloroethylene,PCE)	µg/L	0.5	<0.5	<0.5	<0.5
1,1,1,2-tetrachloroethane	µg/L	0.5	<0.5	<0.5	<0.5
Chlorobenzene	µg/L	0.5	<0.5	<0.5	<0.5
Ethylbenzene	µg/L	0.5	<0.5	<0.5	<0.5
Bromoform (THM)	µg/L	0.5	<0.5	<0.5	<0.5
m/p-xylene	µg/L	1	<1	<1	<1
cis-1,4-dichloro-2-butene	µg/L	1	<1	<1	<1
Styrene (Vinyl benzene)	µg/L	0.5	<0.5	<0.5	<0.5
1,1,2,2-tetrachloroethane	µg/L	0.5	<0.5	<0.5	<0.5
o-xylene	µg/L	0.5	<0.5	<0.5	<0.5
Total Xylenes	µg/L	1.5	<1.5	<1.5	<1.5
1,2,3-trichloropropane	µg/L	0.5	<0.5	<0.5	<0.5
trans-1,4-dichloro-2-butene	µg/L	1	<1	<1	<1
Isopropylbenzene (Cumene)	µg/L	0.5	<0.5	<0.5	<0.5
Bromobenzene	µg/L	0.5	<0.5	<0.5	<0.5

VOCs in Water [AN433] Tested: 20/4/2021 (continued)

PARAMETER	UOM	LOR	MW9	QC1	QC1A
			WATER - 13/4/2021 SE218617.006	WATER - 13/4/2021 SE218617.007	WATER - 13/4/2021 SE218617.008
n-propylbenzene	µg/L	0.5	<0.5	<0.5	<0.5
2-chlorotoluene	µg/L	0.5	<0.5	<0.5	<0.5
4-chlorotoluene	µg/L	0.5	<0.5	<0.5	<0.5
1,3,5-trimethylbenzene	µg/L	0.5	<0.5	<0.5	<0.5
tert-butylbenzene	µg/L	0.5	<0.5	<0.5	<0.5
1,2,4-trimethylbenzene	µg/L	0.5	<0.5	<0.5	<0.5
sec-butylbenzene	µg/L	0.5	<0.5	<0.5	<0.5
1,3-dichlorobenzene	µg/L	0.5	<0.5	<0.5	<0.5
1,4-dichlorobenzene	µg/L	0.3	<0.3	<0.3	<0.3
p-isopropyltoluene	µg/L	0.5	<0.5	<0.5	<0.5
1,2-dichlorobenzene	µg/L	0.5	<0.5	<0.5	<0.5
n-butylbenzene	µg/L	0.5	<0.5	<0.5	<0.5
1,2-dibromo-3-chloropropane	µg/L	0.5	<0.5	<0.5	<0.5
1,2,4-trichlorobenzene	µg/L	0.5	<0.5	<0.5	<0.5
Naphthalene	µg/L	0.5	<0.5	<0.5	<0.5
Hexachlorobutadiene	µg/L	0.5	<0.5	<0.5	<0.5
1,2,3-trichlorobenzene	µg/L	0.5	<0.5	<0.5	<0.5
Total BTEX	µg/L	3	<3	<3	<3
Total VOC	µg/L	10	<10	<10	<10

Volatile Petroleum Hydrocarbons in Water [AN433] Tested: 20/4/2021

PARAMETER	UOM	LOR	MW4	MW5	MW6	MW7	MW8
			WATER	WATER	WATER	WATER	WATER
			-	-	-	-	-
			13/4/2021 SE218617.001	13/4/2021 SE218617.002	13/4/2021 SE218617.003	13/4/2021 SE218617.004	13/4/2021 SE218617.005
Benzene (F0)	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TRH C6-C9	µg/L	40	<40	<40	<40	<40	<40
TRH C6-C10	µg/L	50	<50	<50	<50	<50	<50
TRH C6-C10 minus BTEX (F1)	µg/L	50	<50	<50	<50	<50	<50

PARAMETER	UOM	LOR	MW9	QC1	QC1A
			WATER	WATER	WATER
			-	-	-
			13/4/2021 SE218617.006	13/4/2021 SE218617.007	13/4/2021 SE218617.008
Benzene (F0)	µg/L	0.5	<0.5	<0.5	<0.5
TRH C6-C9	µg/L	40	<40	<40	<40
TRH C6-C10	µg/L	50	<50	<50	<50
TRH C6-C10 minus BTEX (F1)	µg/L	50	<50	<50	<50

TRH (Total Recoverable Hydrocarbons) in Water [AN403] Tested: 19/4/2021

PARAMETER	UOM	LOR	MW4	MW5	MW6	MW7	MW8
			WATER	WATER	WATER	WATER	WATER
			- 13/4/2021 SE218617.001	- 13/4/2021 SE218617.002	- 13/4/2021 SE218617.003	- 13/4/2021 SE218617.004	- 13/4/2021 SE218617.005
TRH C10-C14	µg/L	50	<50	<50	<50	<50	<50
TRH C15-C28	µg/L	200	<200	<200	<200	<200	<200
TRH C29-C36	µg/L	200	<200	<200	<200	<200	<200
TRH C37-C40	µg/L	200	<200	<200	<200	<200	<200
TRH >C10-C16	µg/L	60	<60	<60	<60	<60	<60
TRH >C10-C16 - Naphthalene (F2)	µg/L	60	<60	<60	<60	<60	<60
TRH >C16-C34 (F3)	µg/L	500	<500	<500	<500	<500	<500
TRH >C34-C40 (F4)	µg/L	500	<500	<500	<500	<500	<500
TRH C10-C40	µg/L	320	<320	<320	<320	<320	<320

PARAMETER	UOM	LOR	MW9	QC1	QC1A
			WATER	WATER	WATER
			- 13/4/2021 SE218617.006	- 13/4/2021 SE218617.007	- 13/4/2021 SE218617.008
TRH C10-C14	µg/L	50	<50	<50	<50
TRH C15-C28	µg/L	200	<200	<200	<200
TRH C29-C36	µg/L	200	<200	<200	<200
TRH C37-C40	µg/L	200	<200	<200	<200
TRH >C10-C16	µg/L	60	<60	<60	<60
TRH >C10-C16 - Naphthalene (F2)	µg/L	60	<60	<60	<60
TRH >C16-C34 (F3)	µg/L	500	<500	<500	<500
TRH >C34-C40 (F4)	µg/L	500	<500	<500	<500
TRH C10-C40	µg/L	320	<320	<320	<320

PAH (Polynuclear Aromatic Hydrocarbons) in Water [AN420] Tested: 19/4/2021

PARAMETER	UOM	LOR	MW4	MW5	MW6	MW7	MW8
			WATER	WATER	WATER	WATER	WATER
			13/4/2021 SE218617.001	13/4/2021 SE218617.002	13/4/2021 SE218617.003	13/4/2021 SE218617.004	13/4/2021 SE218617.005
Naphthalene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(ah)anthracene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total PAH (18)	µg/L	1	<1	<1	<1	<1	<1

PARAMETER	UOM	LOR	MW9	QC1	QC1A
			WATER	WATER	WATER
			13/4/2021 SE218617.006	13/4/2021 SE218617.007	13/4/2021 SE218617.008
Naphthalene	µg/L	0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	µg/L	0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	µg/L	0.1	<0.1	<0.1	<0.1
Acenaphthylene	µg/L	0.1	<0.1	<0.1	<0.1
Acenaphthene	µg/L	0.1	<0.1	<0.1	<0.1
Fluorene	µg/L	0.1	<0.1	<0.1	<0.1
Phenanthrene	µg/L	0.1	<0.1	<0.1	<0.1
Anthracene	µg/L	0.1	<0.1	<0.1	<0.1
Fluoranthene	µg/L	0.1	<0.1	<0.1	<0.1
Pyrene	µg/L	0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	0.1	<0.1	<0.1	<0.1
Chrysene	µg/L	0.1	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	µg/L	0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	µg/L	0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	µg/L	0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1	<0.1	<0.1
Dibenzo(ah)anthracene	µg/L	0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	µg/L	0.1	<0.1	<0.1	<0.1
Total PAH (18)	µg/L	1	<1	<1	<1

Anions by Ion Chromatography in Water [AN245] Tested: 20/4/2021

			MW4	MW5	MW6	MW7	MW8
			WATER	WATER	WATER	WATER	WATER
			-	-	-	-	-
			13/4/2021	13/4/2021	13/4/2021	13/4/2021	13/4/2021
PARAMETER	UOM	LOR	SE218617.001	SE218617.002	SE218617.003	SE218617.004	SE218617.005
Fluoride	mg/L	0.1	4.6	1.5	8.7	<0.10	<0.10

			MW9	QC1	QC1A
			WATER	WATER	WATER
			-	-	-
			13/4/2021	13/4/2021	13/4/2021
PARAMETER	UOM	LOR	SE218617.006	SE218617.007	SE218617.008
Fluoride	mg/L	0.1	12	<0.10	0.15

Trace Metals (Dissolved) in Water by ICPMS [AN318] Tested: 19/4/2021

PARAMETER	UOM	LOR	MW4	MW5	MW6	MW7	MW8
			WATER	WATER	WATER	WATER	WATER
			- 13/4/2021 SE218617.001	- 13/4/2021 SE218617.002	- 13/4/2021 SE218617.003	- 13/4/2021 SE218617.004	- 13/4/2021 SE218617.005
Arsenic, As	µg/L	1	2	<1	<1	<1	<1
Cadmium, Cd	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Copper, Cu	µg/L	1	3	3	1	3	<1
Chromium, Cr	µg/L	1	3	3	6	4	3
Nickel, Ni	µg/L	1	2	2	<1	<1	<1
Lead, Pb	µg/L	1	<1	<1	<1	<1	<1
Zinc, Zn	µg/L	5	34	33	6	89	18

PARAMETER	UOM	LOR	MW9	QC1	QC1A
			WATER	WATER	WATER
			- 13/4/2021 SE218617.006	- 13/4/2021 SE218617.007	- 13/4/2021 SE218617.008
Arsenic, As	µg/L	1	<1	<1	<1
Cadmium, Cd	µg/L	0.1	<0.1	<0.1	<0.1
Copper, Cu	µg/L	1	<1	2	<1
Chromium, Cr	µg/L	1	3	4	4
Nickel, Ni	µg/L	1	<1	<1	<1
Lead, Pb	µg/L	1	<1	<1	<1
Zinc, Zn	µg/L	5	<5	83	77

Mercury (dissolved) in Water [AN311(Perth)/AN312] Tested: 19/4/2021

			MW4	MW5	MW6	MW7	MW8
			WATER	WATER	WATER	WATER	WATER
			-	-	-	-	-
			13/4/2021	13/4/2021	13/4/2021	13/4/2021	13/4/2021
PARAMETER	UOM	LOR	SE218617.001	SE218617.002	SE218617.003	SE218617.004	SE218617.005
Mercury	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

			MW9	QC1	QC1A
			WATER	WATER	WATER
			-	-	-
			13/4/2021	13/4/2021	13/4/2021
PARAMETER	UOM	LOR	SE218617.006	SE218617.007	SE218617.008
Mercury	mg/L	0.0001	<0.0001	<0.0001	<0.0001

Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous Samples - Low Level [MA-1523] Tested: 20/4/2021

PARAMETER	UOM	LOR	MW4	MW5	MW6	MW7	MW8
			WATER	WATER	WATER	WATER	WATER
			13/4/2021 SE218617.001	13/4/2021 SE218617.002	13/4/2021 SE218617.003	13/4/2021 SE218617.004	13/4/2021 SE218617.005
Perfluorobutanoic acid (PFBA)	µg/L	0.0005	0.020	0.022	<0.0005	0.0030	<0.0005
Perfluoropentanoic acid (PFPeA)	µg/L	0.0005	0.0079	0.0055	<0.0005	0.0034	<0.0005
Perfluorohexanoic acid (PFHxA)	µg/L	0.0005	0.0095	0.0072	<0.0005	0.0048	<0.0005
Perfluoroheptanoic acid (PFHpA)	µg/L	0.0005	0.0053	0.0022	<0.0005	0.0014	<0.0005
Perfluorooctanoic Acid (PFOA)	µg/L	0.0005	0.0067	0.0023	<0.0005	0.0052	0.0031
Perfluorononanoic acid (PFNA)	µg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluorodecanoic acid (PFDA)	µg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoroundecanoic acid (PFUnA)	µg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluorododecanoic acid (PFDoA)	µg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluorohexadecanoic acid (PFHxDA)	µg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorobutane sulfonate (PFBS)	µg/L	0.001	0.003	0.002	<0.001	0.001	0.002
Perfluoropentane sulfonate (PFPeS)	µg/L	0.001	0.003	0.002	<0.001	<0.001	0.002
Perfluorohexane sulfonate (PFHxS)	µg/L	0.0002	0.028	0.015	0.0006	0.0043	0.023
Perfluoroheptane sulfonate (PFHpS)	µg/L	0.0002	0.0006	<0.0002	<0.0002	0.0002	0.0004
Perfluorooctane sulfonate (PFOS)	µg/L	0.0002	0.0063	0.0057	<0.0002	0.0043	0.0040
Sum of PFHxS and PFOS	µg/L	0.0002	0.035	0.020	0.0006	0.0086	0.027
Perfluorononane sulfonate (PFNS)	µg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorodecane sulfonate (PFDS)	µg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorododecane sulfonate (PFDoS)	µg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1H,1H,2H,2H-Perfluorohexane sulfonate (4:2) (4:2 FTS)	µg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1H,1H,2H,2H-Perfluorooctane sulfonate (6:2) (6:2 FTS)	µg/L	0.0005	<0.0005	0.0050	<0.0005	<0.0005	<0.0005
1H,1H,2H,2H-Perfluorodecane sulfonate (8:2) (8:2 FTS)	µg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorooctane sulfonamide (PFOSA)	µg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
N-Methylperfluorooctane sulfonamide (N-MeFOSA)	µg/L	0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
N-Ethylperfluorooctane sulfonamide (N-EtFOSA)	µg/L	0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
2-(N-Methylperfluorooctane sulfonamido)-ethanol	µg/L	0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
2-(N-Ethylperfluorooctane sulfonamido)-ethanol	µg/L	0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
N-Methylperfluorooctanesulfonamidoacetic acid	µg/L	0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
N-Ethylperfluorooctanesulfonamidoacetic Acid	µg/L	0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025

Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous Samples - Low Level [MA-1523] Tested: 20/4/2021 (continued)

PARAMETER	UOM	LOR	MW9	QC1	QC1A
			WATER - 13/4/2021 SE218617.006	WATER - 13/4/2021 SE218617.007	WATER - 13/4/2021 SE218617.008
Perfluorobutanoic acid (PFBA)	µg/L	0.0005	<0.0005	0.0024	0.0021
Perfluoropentanoic acid (PFPeA)	µg/L	0.0005	<0.0005	0.0023	0.0021
Perfluorohexanoic acid (PFHxA)	µg/L	0.0005	<0.0005	0.0039	0.0036
Perfluoroheptanoic acid (PFHpA)	µg/L	0.0005	<0.0005	0.0020	0.0015
Perfluorooctanoic Acid (PFOA)	µg/L	0.0005	<0.0005	0.0040	0.0045
Perfluorononanoic acid (PFNA)	µg/L	0.001	<0.001	<0.001	<0.001
Perfluorodecanoic acid (PFDA)	µg/L	0.001	<0.001	<0.001	<0.001
Perfluoroundecanoic acid (PFUnA)	µg/L	0.001	<0.001	<0.001	<0.001
Perfluorododecanoic acid (PFDoA)	µg/L	0.001	<0.001	<0.001	<0.001
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.001	<0.001	<0.001	<0.001
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.001	<0.001	<0.001	<0.001
Perfluorohexadecanoic acid (PFHxDA)	µg/L	0.002	<0.002	<0.002	<0.002
Perfluorobutane sulfonate (PFBS)	µg/L	0.001	<0.001	0.001	0.001
Perfluoropentane sulfonate (PFPeS)	µg/L	0.001	<0.001	<0.001	<0.001
Perfluorohexane sulfonate (PFHxS)	µg/L	0.0002	0.0003	0.0033	0.0042
Perfluoroheptane sulfonate (PFHpS)	µg/L	0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonate (PFOS)	µg/L	0.0002	<0.0002	0.0030	0.0038
Sum of PFHxS and PFOS	µg/L	0.0002	0.0003	0.0063	0.0080
Perfluorononane sulfonate (PFNS)	µg/L	0.0005	<0.0005	<0.0005	<0.0005
Perfluorodecane sulfonate (PFDS)	µg/L	0.0005	<0.0005	<0.0005	<0.0005
Perfluorododecane sulfonate (PFDoS)	µg/L	0.0005	<0.0005	<0.0005	<0.0005
1H,1H,2H,2H-Perfluorohexane sulfonate (4:2) (4:2 FTS)	µg/L	0.0005	<0.0005	<0.0005	<0.0005
1H,1H,2H,2H-Perfluorooctane sulfonate (6:2) (6:2 FTS)	µg/L	0.0005	<0.0005	<0.0005	<0.0005
1H,1H,2H,2H-Perfluorodecane sulfonate (8:2) (8:2 FTS)	µg/L	0.0005	<0.0005	<0.0005	<0.0005
Perfluorooctane sulfonamide (PFOSA)	µg/L	0.002	<0.002	<0.002	<0.002
N-Methylperfluorooctane sulfonamide (N-MeFOSA)	µg/L	0.0025	<0.0025	<0.0025	<0.0025
N-Ethylperfluorooctane sulfonamide (N-EtFOSA)	µg/L	0.0025	<0.0025	<0.0025	<0.0025
2-(N-Methylperfluorooctane sulfonamido)-ethanol	µg/L	0.0025	<0.0025	<0.0025	<0.0025
2-(N-Ethylperfluorooctane sulfonamido)-ethanol	µg/L	0.0025	<0.0025	<0.0025	<0.0025
N-Methylperfluorooctanesulfonamidoacetic acid	µg/L	0.0025	<0.0025	<0.0025	<0.0025
N-Ethylperfluorooctanesulfonamidoacetic Acid	µg/L	0.0025	<0.0025	<0.0025	<0.0025

METHOD

METHODOLOGY SUMMARY

AN020	Unpreserved water sample is filtered through a 0.45µm membrane filter and acidified with nitric acid similar to APHA3030B.
AN245	Anions by Ion Chromatography: A water sample is injected into an eluent stream that passes through the ion chromatographic system where the anions of interest ie Br, Cl, NO ₂ , NO ₃ and SO ₄ are separated on their relative affinities for the active sites on the column packing material. Changes to the conductivity and the UV-visible absorbance of the eluent enable identification and quantitation of the anions based on their retention time and peak height or area. APHA 4110 B
AN311(Perth)/AN312	Mercury by Cold Vapour AAS in Waters: Mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500.
AN318	Determination of elements at trace level in waters by ICP-MS technique,, referenced to USEPA 6020B and USEPA 200.8 (5.4).
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the NEPM 1999 (2013), >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). Where F2 is corrected for Naphthalene, the VOC data for Naphthalene is used.
AN403	Additionally, the volatile C6-C9/C6-C10 fractions may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Recoverable Hydrocarbons - Silica (TRH-Silica) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents.
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependent on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.
AN420	(SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN433	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC's are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.
MA-1523	This method covers the analysis of per- and polyfluoroalkyl substances (PFAS) in aqueous, solid and biosolid samples and solvent extracts, determined as the total of linear and branched isomers. After spiking with isotopically labelled quantification surrogates and clean-up via SPE cartridges sample extracts are analysed by liquid chromatography/mass spectrometry (LC-MS/MS). PFAS concentrations are determined by isotope dilution quantification.

FOOTNOTES

*	NATA accreditation does not cover the performance of this service.	-	Not analysed.	UOM	Unit of Measure.
**	Indicative data, theoretical holding time exceeded.	NVL	Not validated.	LOR	Limit of Reporting.
***	Indicates that both * and ** apply.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the "Total" LOR will be the sum of those two LORs.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.

Note that in terms of units of radioactivity:

- 1 Bq is equivalent to 27 pCi
- 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au/en-gb/environment-health-and-safety.

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STATEMENT OF QA/QC PERFORMANCE

SE218617 R0

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Samples 8

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SGS Reference SE218617 R0
Date Received 15 Apr 2021
Date Reported 22 Apr 2021

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS' stated Data Quality Objectives (DQO). Comments arising from the comparison were made and are reported below.

The data relating to sampling was taken from the Chain of Custody document.

This QA/QC Statement must be read in conjunction with the referenced Analytical Report.

The Statement and the Analytical Report must not be reproduced except in full.

All Data Quality Objectives were met with the exception of the following:

Surrogate	PAH (Polynuclear Aromatic Hydrocarbons) in Water	3 items
	Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous Samples - Low Level	2 items

SAMPLE SUMMARY

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the

Anions by Ion Chromatography in Water

Method: ME-(AU)-[ENV]AN245

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW4	SE218617.001	LB222913	13 Apr 2021	15 Apr 2021	11 May 2021	20 Apr 2021	11 May 2021	20 Apr 2021
MW5	SE218617.002	LB222913	13 Apr 2021	15 Apr 2021	11 May 2021	20 Apr 2021	11 May 2021	20 Apr 2021
MW6	SE218617.003	LB222913	13 Apr 2021	15 Apr 2021	11 May 2021	20 Apr 2021	11 May 2021	20 Apr 2021
MW7	SE218617.004	LB222913	13 Apr 2021	15 Apr 2021	11 May 2021	20 Apr 2021	11 May 2021	20 Apr 2021
MW8	SE218617.005	LB222913	13 Apr 2021	15 Apr 2021	11 May 2021	20 Apr 2021	11 May 2021	20 Apr 2021
MW9	SE218617.006	LB222913	13 Apr 2021	15 Apr 2021	11 May 2021	20 Apr 2021	11 May 2021	20 Apr 2021
QC1	SE218617.007	LB222913	13 Apr 2021	15 Apr 2021	11 May 2021	20 Apr 2021	11 May 2021	20 Apr 2021
QC1A	SE218617.008	LB222913	13 Apr 2021	15 Apr 2021	11 May 2021	20 Apr 2021	11 May 2021	20 Apr 2021

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW4	SE218617.001	LB222817	13 Apr 2021	15 Apr 2021	11 May 2021	19 Apr 2021	11 May 2021	19 Apr 2021
MW5	SE218617.002	LB222817	13 Apr 2021	15 Apr 2021	11 May 2021	19 Apr 2021	11 May 2021	19 Apr 2021
MW6	SE218617.003	LB222817	13 Apr 2021	15 Apr 2021	11 May 2021	19 Apr 2021	11 May 2021	19 Apr 2021
MW7	SE218617.004	LB222817	13 Apr 2021	15 Apr 2021	11 May 2021	19 Apr 2021	11 May 2021	19 Apr 2021
MW8	SE218617.005	LB222817	13 Apr 2021	15 Apr 2021	11 May 2021	19 Apr 2021	11 May 2021	19 Apr 2021
MW9	SE218617.006	LB222817	13 Apr 2021	15 Apr 2021	11 May 2021	19 Apr 2021	11 May 2021	19 Apr 2021
QC1	SE218617.007	LB222817	13 Apr 2021	15 Apr 2021	11 May 2021	19 Apr 2021	11 May 2021	19 Apr 2021
QC1A	SE218617.008	LB222817	13 Apr 2021	15 Apr 2021	11 May 2021	19 Apr 2021	11 May 2021	19 Apr 2021

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW4	SE218617.001	LB222820	13 Apr 2021	15 Apr 2021	20 Apr 2021	19 Apr 2021	29 May 2021	20 Apr 2021
MW5	SE218617.002	LB222820	13 Apr 2021	15 Apr 2021	20 Apr 2021	19 Apr 2021	29 May 2021	20 Apr 2021
MW6	SE218617.003	LB222820	13 Apr 2021	15 Apr 2021	20 Apr 2021	19 Apr 2021	29 May 2021	20 Apr 2021
MW7	SE218617.004	LB222820	13 Apr 2021	15 Apr 2021	20 Apr 2021	19 Apr 2021	29 May 2021	20 Apr 2021
MW8	SE218617.005	LB222820	13 Apr 2021	15 Apr 2021	20 Apr 2021	19 Apr 2021	29 May 2021	20 Apr 2021
MW9	SE218617.006	LB222820	13 Apr 2021	15 Apr 2021	20 Apr 2021	19 Apr 2021	29 May 2021	20 Apr 2021
QC1	SE218617.007	LB222820	13 Apr 2021	15 Apr 2021	20 Apr 2021	19 Apr 2021	29 May 2021	20 Apr 2021
QC1A	SE218617.008	LB222820	13 Apr 2021	15 Apr 2021	20 Apr 2021	19 Apr 2021	29 May 2021	20 Apr 2021

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW4	SE218617.001	LB222814	13 Apr 2021	15 Apr 2021	10 Oct 2021	19 Apr 2021	10 Oct 2021	19 Apr 2021
MW5	SE218617.002	LB222814	13 Apr 2021	15 Apr 2021	10 Oct 2021	19 Apr 2021	10 Oct 2021	19 Apr 2021
MW6	SE218617.003	LB222814	13 Apr 2021	15 Apr 2021	10 Oct 2021	19 Apr 2021	10 Oct 2021	19 Apr 2021
MW7	SE218617.004	LB222814	13 Apr 2021	15 Apr 2021	10 Oct 2021	19 Apr 2021	10 Oct 2021	19 Apr 2021
MW8	SE218617.005	LB222814	13 Apr 2021	15 Apr 2021	10 Oct 2021	19 Apr 2021	10 Oct 2021	19 Apr 2021
MW9	SE218617.006	LB222814	13 Apr 2021	15 Apr 2021	10 Oct 2021	19 Apr 2021	10 Oct 2021	19 Apr 2021
QC1	SE218617.007	LB222814	13 Apr 2021	15 Apr 2021	10 Oct 2021	19 Apr 2021	10 Oct 2021	19 Apr 2021
QC1A	SE218617.008	LB222814	13 Apr 2021	15 Apr 2021	10 Oct 2021	19 Apr 2021	10 Oct 2021	19 Apr 2021

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW4	SE218617.001	LB222820	13 Apr 2021	15 Apr 2021	20 Apr 2021	19 Apr 2021	29 May 2021	20 Apr 2021
MW5	SE218617.002	LB222820	13 Apr 2021	15 Apr 2021	20 Apr 2021	19 Apr 2021	29 May 2021	20 Apr 2021
MW6	SE218617.003	LB222820	13 Apr 2021	15 Apr 2021	20 Apr 2021	19 Apr 2021	29 May 2021	20 Apr 2021
MW7	SE218617.004	LB222820	13 Apr 2021	15 Apr 2021	20 Apr 2021	19 Apr 2021	29 May 2021	20 Apr 2021
MW8	SE218617.005	LB222820	13 Apr 2021	15 Apr 2021	20 Apr 2021	19 Apr 2021	29 May 2021	20 Apr 2021
MW9	SE218617.006	LB222820	13 Apr 2021	15 Apr 2021	20 Apr 2021	19 Apr 2021	29 May 2021	20 Apr 2021
QC1	SE218617.007	LB222820	13 Apr 2021	15 Apr 2021	20 Apr 2021	19 Apr 2021	29 May 2021	20 Apr 2021
QC1A	SE218617.008	LB222820	13 Apr 2021	15 Apr 2021	20 Apr 2021	19 Apr 2021	29 May 2021	20 Apr 2021

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW4	SE218617.001	LB222924	13 Apr 2021	15 Apr 2021	20 Apr 2021	20 Apr 2021	30 May 2021	21 Apr 2021
MW5	SE218617.002	LB222924	13 Apr 2021	15 Apr 2021	20 Apr 2021	20 Apr 2021	30 May 2021	21 Apr 2021
MW6	SE218617.003	LB222924	13 Apr 2021	15 Apr 2021	20 Apr 2021	20 Apr 2021	30 May 2021	21 Apr 2021
MW7	SE218617.004	LB222924	13 Apr 2021	15 Apr 2021	20 Apr 2021	20 Apr 2021	30 May 2021	21 Apr 2021
MW8	SE218617.005	LB222924	13 Apr 2021	15 Apr 2021	20 Apr 2021	20 Apr 2021	30 May 2021	21 Apr 2021
MW9	SE218617.006	LB222924	13 Apr 2021	15 Apr 2021	20 Apr 2021	20 Apr 2021	30 May 2021	21 Apr 2021
QC1	SE218617.007	LB222924	13 Apr 2021	15 Apr 2021	20 Apr 2021	20 Apr 2021	30 May 2021	21 Apr 2021

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the

VOCs in Water (continued)

Method: ME-(AU)-ENVJAN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC1A	SE218617.008	LB222924	13 Apr 2021	15 Apr 2021	20 Apr 2021	20 Apr 2021	30 May 2021	21 Apr 2021

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-ENVJAN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW4	SE218617.001	LB222924	13 Apr 2021	15 Apr 2021	20 Apr 2021	20 Apr 2021	30 May 2021	21 Apr 2021
MW5	SE218617.002	LB222924	13 Apr 2021	15 Apr 2021	20 Apr 2021	20 Apr 2021	30 May 2021	21 Apr 2021
MW6	SE218617.003	LB222924	13 Apr 2021	15 Apr 2021	20 Apr 2021	20 Apr 2021	30 May 2021	21 Apr 2021
MW7	SE218617.004	LB222924	13 Apr 2021	15 Apr 2021	20 Apr 2021	20 Apr 2021	30 May 2021	21 Apr 2021
MW8	SE218617.005	LB222924	13 Apr 2021	15 Apr 2021	20 Apr 2021	20 Apr 2021	30 May 2021	21 Apr 2021
MW9	SE218617.006	LB222924	13 Apr 2021	15 Apr 2021	20 Apr 2021	20 Apr 2021	30 May 2021	21 Apr 2021
QC1	SE218617.007	LB222924	13 Apr 2021	15 Apr 2021	20 Apr 2021	20 Apr 2021	30 May 2021	21 Apr 2021
QC1A	SE218617.008	LB222924	13 Apr 2021	15 Apr 2021	20 Apr 2021	20 Apr 2021	30 May 2021	21 Apr 2021

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	MW4	SE218617.001	%	40 - 130%	29 ④
	MW5	SE218617.002	%	40 - 130%	58
	MW6	SE218617.003	%	40 - 130%	63
	MW7	SE218617.004	%	40 - 130%	48
	MW8	SE218617.005	%	40 - 130%	54
	MW9	SE218617.006	%	40 - 130%	65
	QC1	SE218617.007	%	40 - 130%	52
	QC1A	SE218617.008	%	40 - 130%	55
d14-p-terphenyl (Surrogate)	MW4	SE218617.001	%	40 - 130%	45
	MW5	SE218617.002	%	40 - 130%	89
	MW6	SE218617.003	%	40 - 130%	90
	MW7	SE218617.004	%	40 - 130%	65
	MW8	SE218617.005	%	40 - 130%	73
	MW9	SE218617.006	%	40 - 130%	88
	QC1	SE218617.007	%	40 - 130%	81
	QC1A	SE218617.008	%	40 - 130%	82
d5-nitrobenzene (Surrogate)	MW4	SE218617.001	%	40 - 130%	24 ④
	MW5	SE218617.002	%	40 - 130%	48
	MW6	SE218617.003	%	40 - 130%	50
	MW7	SE218617.004	%	40 - 130%	39 ④
	MW8	SE218617.005	%	40 - 130%	43
	MW9	SE218617.006	%	40 - 130%	50
	QC1	SE218617.007	%	40 - 130%	44
	QC1A	SE218617.008	%	40 - 130%	47

Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous Samples - Low Level

Method: MA-1523

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
(13C2_PFTeDA) Isotopically Labelled Internal Recovery Standard	MW4	SE218617.001	%	10 - 150%	116
	MW5	SE218617.002	%	10 - 150%	95
	MW6	SE218617.003	%	10 - 150%	102
	MW7	SE218617.004	%	10 - 150%	118
	MW8	SE218617.005	%	10 - 150%	132
	MW9	SE218617.006	%	10 - 150%	93
	QC1	SE218617.007	%	10 - 150%	110
	QC1A	SE218617.008	%	10 - 150%	91
(13C2-4:2 FTS) Isotopically Labelled Internal Recovery Standard	MW4	SE218617.001	%	10 - 150%	61
	MW5	SE218617.002	%	10 - 150%	60
	MW6	SE218617.003	%	10 - 150%	78
	MW7	SE218617.004	%	10 - 150%	72
	MW8	SE218617.005	%	10 - 150%	73
	MW9	SE218617.006	%	10 - 150%	73
	QC1	SE218617.007	%	10 - 150%	79
	QC1A	SE218617.008	%	10 - 150%	73
(13C2-6:2 FTS) Isotopically Labelled Internal Recovery Standard	MW4	SE218617.001	%	10 - 150%	67
	MW5	SE218617.002	%	10 - 150%	67
	MW6	SE218617.003	%	10 - 150%	81
	MW7	SE218617.004	%	10 - 150%	67
	MW8	SE218617.005	%	10 - 150%	78
	MW9	SE218617.006	%	10 - 150%	78
	QC1	SE218617.007	%	10 - 150%	91
	QC1A	SE218617.008	%	10 - 150%	82
(13C2-8:2 FTS) Isotopically Labelled Internal Recovery Standard	MW4	SE218617.001	%	10 - 150%	93
	MW5	SE218617.002	%	10 - 150%	64
	MW6	SE218617.003	%	10 - 150%	73
	MW7	SE218617.004	%	10 - 150%	90
	MW8	SE218617.005	%	10 - 150%	96
	MW9	SE218617.006	%	10 - 150%	78
	QC1	SE218617.007	%	10 - 150%	85
	QC1A	SE218617.008	%	10 - 150%	84
(13C2-PFDoA) Isotopically Labelled Internal Recovery Standard	MW4	SE218617.001	%	10 - 150%	116
	MW5	SE218617.002	%	10 - 150%	96

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous Samples - Low Level (continued)

Method: MA-1523

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
(13C2-PFDoA) Isotopically Labelled Internal Recovery Standard	MW6	SE218617.003	%	10 - 150%	98
	MW7	SE218617.004	%	10 - 150%	111
	MW8	SE218617.005	%	10 - 150%	131
	MW9	SE218617.006	%	10 - 150%	99
	QC1	SE218617.007	%	10 - 150%	111
	QC1A	SE218617.008	%	10 - 150%	94
(13C2-PFHxDA) Isotopically Labelled Internal Recovery Standard	MW4	SE218617.001	%	10 - 150%	142
	MW5	SE218617.002	%	10 - 150%	88
	MW6	SE218617.003	%	10 - 150%	100
	MW7	SE218617.004	%	10 - 150%	151 ↑
	MW8	SE218617.005	%	10 - 150%	163 ↑
	MW9	SE218617.006	%	10 - 150%	93
	QC1	SE218617.007	%	10 - 150%	117
	QC1A	SE218617.008	%	10 - 150%	86
(13C3-PFBS) Isotopically Labelled Internal Recovery Standard	MW4	SE218617.001	%	10 - 150%	90
	MW5	SE218617.002	%	10 - 150%	90
	MW6	SE218617.003	%	10 - 150%	98
	MW7	SE218617.004	%	10 - 150%	86
	MW8	SE218617.005	%	10 - 150%	85
	MW9	SE218617.006	%	10 - 150%	95
	QC1	SE218617.007	%	10 - 150%	97
	QC1A	SE218617.008	%	10 - 150%	91
(13C3-PFHxS) Isotopically Labelled Internal Recovery Standard	MW4	SE218617.001	%	10 - 150%	101
	MW5	SE218617.002	%	10 - 150%	95
	MW6	SE218617.003	%	10 - 150%	91
	MW7	SE218617.004	%	10 - 150%	94
	MW8	SE218617.005	%	10 - 150%	95
	MW9	SE218617.006	%	10 - 150%	100
	QC1	SE218617.007	%	10 - 150%	103
	QC1A	SE218617.008	%	10 - 150%	90
(13C4_PFOA) Isotopically Labelled Internal Recovery Standard	MW4	SE218617.001	%	10 - 150%	107
	MW5	SE218617.002	%	10 - 150%	101
	MW6	SE218617.003	%	10 - 150%	107
	MW7	SE218617.004	%	10 - 150%	102
	MW8	SE218617.005	%	10 - 150%	99
	MW9	SE218617.006	%	10 - 150%	105
	QC1	SE218617.007	%	10 - 150%	108
	QC1A	SE218617.008	%	10 - 150%	106
(13C4-PFBA) Isotopically Labelled Internal Recovery Standard	MW4	SE218617.001	%	10 - 150%	100
	MW5	SE218617.002	%	10 - 150%	102
	MW6	SE218617.003	%	10 - 150%	99
	MW7	SE218617.004	%	10 - 150%	100
	MW8	SE218617.005	%	10 - 150%	100
	MW9	SE218617.006	%	10 - 150%	99
	QC1	SE218617.007	%	10 - 150%	101
	QC1A	SE218617.008	%	10 - 150%	99
(13C4-PFHpA) Isotopically Labelled Internal Recovery Standard	MW4	SE218617.001	%	10 - 150%	102
	MW5	SE218617.002	%	10 - 150%	96
	MW6	SE218617.003	%	10 - 150%	106
	MW7	SE218617.004	%	10 - 150%	98
	MW8	SE218617.005	%	10 - 150%	95
	MW9	SE218617.006	%	10 - 150%	103
	QC1	SE218617.007	%	10 - 150%	101
	QC1A	SE218617.008	%	10 - 150%	101
(13C5-PFHxA) Isotopically Labelled Internal Recovery Standard	MW4	SE218617.001	%	10 - 150%	99
	MW5	SE218617.002	%	10 - 150%	95
	MW6	SE218617.003	%	10 - 150%	107
	MW7	SE218617.004	%	10 - 150%	91
	MW8	SE218617.005	%	10 - 150%	89
	MW9	SE218617.006	%	10 - 150%	104
	QC1	SE218617.007	%	10 - 150%	105

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous Samples - Low Level (continued)

Method: MA-1523

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
(13C5-PFHxA) Isotopically Labelled Internal Recovery Standard	QC1A	SE218617.008	%	10 - 150%	97
(13C5-PFPeA) Isotopically Labelled Internal Recovery Standard	MW4	SE218617.001	%	10 - 150%	116
	MW5	SE218617.002	%	10 - 150%	99
	MW6	SE218617.003	%	10 - 150%	97
	MW7	SE218617.004	%	10 - 150%	105
	MW8	SE218617.005	%	10 - 150%	107
	MW9	SE218617.006	%	10 - 150%	95
	QC1	SE218617.007	%	10 - 150%	97
(13C6-PFDA) Isotopically Labelled Internal Recovery Standard	QC1A	SE218617.008	%	10 - 150%	96
	MW4	SE218617.001	%	10 - 150%	96
	MW5	SE218617.002	%	10 - 150%	98
	MW6	SE218617.003	%	10 - 150%	94
	MW7	SE218617.004	%	10 - 150%	92
	MW8	SE218617.005	%	10 - 150%	107
	MW9	SE218617.006	%	10 - 150%	101
(13C7-PFUDa) Isotopically Labelled Internal Recovery Standard	QC1	SE218617.007	%	10 - 150%	102
	QC1A	SE218617.008	%	10 - 150%	95
	MW4	SE218617.001	%	10 - 150%	116
	MW5	SE218617.002	%	10 - 150%	101
	MW6	SE218617.003	%	10 - 150%	103
	MW7	SE218617.004	%	10 - 150%	108
	MW8	SE218617.005	%	10 - 150%	135
(13C8-PFOS) Isotopically Labelled Internal Recovery Standard	MW9	SE218617.006	%	10 - 150%	97
	QC1	SE218617.007	%	10 - 150%	108
	QC1A	SE218617.008	%	10 - 150%	96
	MW4	SE218617.001	%	10 - 150%	98
	MW5	SE218617.002	%	10 - 150%	105
	MW6	SE218617.003	%	10 - 150%	103
	MW7	SE218617.004	%	10 - 150%	108
(13C8-PFOSA) Isotopically Labelled Internal Recovery Standard	MW8	SE218617.005	%	10 - 150%	106
	MW9	SE218617.006	%	10 - 150%	115
	QC1	SE218617.007	%	10 - 150%	114
	QC1A	SE218617.008	%	10 - 150%	107
	MW4	SE218617.001	%	10 - 150%	56
	MW5	SE218617.002	%	10 - 150%	93
	MW6	SE218617.003	%	10 - 150%	108
(13C9-PFNA) Isotopically Labelled Internal Recovery Standard	MW7	SE218617.004	%	10 - 150%	71
	MW8	SE218617.005	%	10 - 150%	63
	MW9	SE218617.006	%	10 - 150%	110
	QC1	SE218617.007	%	10 - 150%	104
	QC1A	SE218617.008	%	10 - 150%	104
	MW4	SE218617.001	%	10 - 150%	101
	MW5	SE218617.002	%	10 - 150%	90
(D3-N-MeFOSA) Isotopically Labelled Internal Recovery Standard	MW6	SE218617.003	%	10 - 150%	97
	MW7	SE218617.004	%	10 - 150%	96
	MW8	SE218617.005	%	10 - 150%	100
	MW9	SE218617.006	%	10 - 150%	104
	QC1	SE218617.007	%	10 - 150%	92
	QC1A	SE218617.008	%	10 - 150%	107
	MW4	SE218617.001	%	10 - 150%	65
(D3-N-MeFOSAA) Isotopically Labelled Internal Recovery Standard	MW5	SE218617.002	%	10 - 150%	93
	MW6	SE218617.003	%	10 - 150%	113
	MW7	SE218617.004	%	10 - 150%	81
	MW8	SE218617.005	%	10 - 150%	73
	MW9	SE218617.006	%	10 - 150%	100
	QC1	SE218617.007	%	10 - 150%	100
	QC1A	SE218617.008	%	10 - 150%	95
(D3-N-MeFOSAA) Isotopically Labelled Internal Recovery Standard	MW4	SE218617.001	%	10 - 150%	55
	MW5	SE218617.002	%	10 - 150%	77
	MW6	SE218617.003	%	10 - 150%	101
	MW7	SE218617.004	%	10 - 150%	68

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous Samples - Low Level (continued)

Method: MA-1523

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
(D3-N-MeFOSAA) Isotopically Labelled Internal Recovery Standard	MW8	SE218617.005	%	10 - 150%	56
	MW9	SE218617.006	%	10 - 150%	90
	QC1	SE218617.007	%	10 - 150%	95
	QC1A	SE218617.008	%	10 - 150%	98
(D5-N-EtFOSA) Isotopically Labelled Internal Recovery Standard	MW4	SE218617.001	%	10 - 150%	73
	MW5	SE218617.002	%	10 - 150%	104
	MW6	SE218617.003	%	10 - 150%	103
	MW7	SE218617.004	%	10 - 150%	85
	MW8	SE218617.005	%	10 - 150%	69
	MW9	SE218617.006	%	10 - 150%	115
	QC1	SE218617.007	%	10 - 150%	113
	QC1A	SE218617.008	%	10 - 150%	89
(D5-N-EtFOSAA) Isotopically Labelled Internal Recovery Standard	MW4	SE218617.001	%	10 - 150%	69
	MW5	SE218617.002	%	10 - 150%	69
	MW6	SE218617.003	%	10 - 150%	80
	MW7	SE218617.004	%	10 - 150%	74
	MW8	SE218617.005	%	10 - 150%	85
	MW9	SE218617.006	%	10 - 150%	81
	QC1	SE218617.007	%	10 - 150%	102
	QC1A	SE218617.008	%	10 - 150%	86
(D7-N-MeFOSE) Isotopically Labelled Internal Recovery Standard	MW4	SE218617.001	%	10 - 150%	62
	MW5	SE218617.002	%	10 - 150%	102
	MW6	SE218617.003	%	10 - 150%	98
	MW7	SE218617.004	%	10 - 150%	76
	MW8	SE218617.005	%	10 - 150%	67
	MW9	SE218617.006	%	10 - 150%	101
	QC1	SE218617.007	%	10 - 150%	102
	QC1A	SE218617.008	%	10 - 150%	98
(D9-N-EtFOSE) Isotopically Labelled Internal Recovery Standard	MW4	SE218617.001	%	10 - 150%	64
	MW5	SE218617.002	%	10 - 150%	94
	MW6	SE218617.003	%	10 - 150%	104
	MW7	SE218617.004	%	10 - 150%	96
	MW8	SE218617.005	%	10 - 150%	68
	MW9	SE218617.006	%	10 - 150%	115
	QC1	SE218617.007	%	10 - 150%	104
	QC1A	SE218617.008	%	10 - 150%	100

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	MW4	SE218617.001	%	40 - 130%	98
	MW5	SE218617.002	%	40 - 130%	97
	MW6	SE218617.003	%	40 - 130%	99
	MW7	SE218617.004	%	40 - 130%	98
	MW8	SE218617.005	%	40 - 130%	99
	MW9	SE218617.006	%	40 - 130%	98
	QC1	SE218617.007	%	40 - 130%	100
	QC1A	SE218617.008	%	40 - 130%	99
d4-1,2-dichloroethane (Surrogate)	MW4	SE218617.001	%	40 - 130%	103
	MW5	SE218617.002	%	40 - 130%	103
	MW6	SE218617.003	%	40 - 130%	105
	MW7	SE218617.004	%	40 - 130%	103
	MW8	SE218617.005	%	40 - 130%	105
	MW9	SE218617.006	%	40 - 130%	106
	QC1	SE218617.007	%	40 - 130%	104
	QC1A	SE218617.008	%	40 - 130%	105
d8-toluene (Surrogate)	MW4	SE218617.001	%	40 - 130%	97
	MW5	SE218617.002	%	40 - 130%	96
	MW6	SE218617.003	%	40 - 130%	98
	MW7	SE218617.004	%	40 - 130%	98
	MW8	SE218617.005	%	40 - 130%	97
	MW9	SE218617.006	%	40 - 130%	97

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

VOCs in Water (continued)

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
d8-toluene (Surrogate)	QC1	SE218617.007	%	40 - 130%	98
	QC1A	SE218617.008	%	40 - 130%	98

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	MW4	SE218617.001	%	40 - 130%	98
	MW5	SE218617.002	%	40 - 130%	97
	MW6	SE218617.003	%	40 - 130%	99
	MW7	SE218617.004	%	40 - 130%	98
	MW8	SE218617.005	%	40 - 130%	99
	MW9	SE218617.006	%	40 - 130%	98
	QC1	SE218617.007	%	40 - 130%	100
	QC1A	SE218617.008	%	40 - 130%	99
d4-1,2-dichloroethane (Surrogate)	MW4	SE218617.001	%	60 - 130%	103
	MW5	SE218617.002	%	60 - 130%	103
	MW6	SE218617.003	%	60 - 130%	105
	MW7	SE218617.004	%	60 - 130%	103
	MW8	SE218617.005	%	60 - 130%	105
	MW9	SE218617.006	%	60 - 130%	106
	QC1	SE218617.007	%	60 - 130%	104
	QC1A	SE218617.008	%	60 - 130%	105
d8-toluene (Surrogate)	MW4	SE218617.001	%	40 - 130%	97
	MW5	SE218617.002	%	40 - 130%	96
	MW6	SE218617.003	%	40 - 130%	98
	MW7	SE218617.004	%	40 - 130%	98
	MW8	SE218617.005	%	40 - 130%	97
	MW9	SE218617.006	%	40 - 130%	97
	QC1	SE218617.007	%	40 - 130%	98
	QC1A	SE218617.008	%	40 - 130%	98

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Anions by Ion Chromatography in Water

Method: ME-(AU)-[ENV]AN245

Sample Number	Parameter	Units	LOR	Result
LB222913.001	Fluoride	mg/L	0.1	<0.10

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Sample Number	Parameter	Units	LOR	Result
LB222817.001	Mercury	mg/L	0.0001	<0.0001

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result
LB222820.001	Naphthalene	µg/L	0.1	<0.1
	2-methylnaphthalene	µg/L	0.1	<0.1
	1-methylnaphthalene	µg/L	0.1	<0.1
	Acenaphthylene	µg/L	0.1	<0.1
	Acenaphthene	µg/L	0.1	<0.1
	Fluorene	µg/L	0.1	<0.1
	Phenanthrene	µg/L	0.1	<0.1
	Anthracene	µg/L	0.1	<0.1
	Fluoranthene	µg/L	0.1	<0.1
	Pyrene	µg/L	0.1	<0.1
	Benzo(a)anthracene	µg/L	0.1	<0.1
	Chrysene	µg/L	0.1	<0.1
	Benzo(a)pyrene	µg/L	0.1	<0.1
	Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1
	Dibenzo(ah)anthracene	µg/L	0.1	<0.1
	Benzo(ghi)perylene	µg/L	0.1	<0.1
Surrogates	d5-nitrobenzene (Surrogate)	%	-	50
	2-fluorobiphenyl (Surrogate)	%	-	56
	d14-p-terphenyl (Surrogate)	%	-	72

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR	Result
LB222814.001	Arsenic, As	µg/L	1	<1
	Cadmium, Cd	µg/L	0.1	<0.1
	Chromium, Cr	µg/L	1	<1
	Copper, Cu	µg/L	1	<1
	Lead, Pb	µg/L	1	<1
	Nickel, Ni	µg/L	1	<1
	Zinc, Zn	µg/L	5	<5

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR	Result
LB222820.001	TRH C10-C14	µg/L	50	<50
	TRH C15-C28	µg/L	200	<200
	TRH C29-C36	µg/L	200	<200
	TRH C37-C40	µg/L	200	<200

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB222924.001	Fumigants	2,2-dichloropropane	µg/L	0.5	<0.5
		1,2-dichloropropane	µg/L	0.5	<0.5
		cis-1,3-dichloropropene	µg/L	0.5	<0.5
		trans-1,3-dichloropropene	µg/L	0.5	<0.5
		1,2-dibromoethane (EDB)	µg/L	0.5	<0.5
	Halogenated Aliphatics	Dichlorodifluoromethane (CFC-12)	µg/L	5	<5
		Chloromethane	µg/L	5	<5
		Vinyl chloride (Chloroethene)	µg/L	0.3	<0.3
		Bromomethane	µg/L	10	<10
		Chloroethane	µg/L	5	<5
		Trichlorofluoromethane	µg/L	1	<1
		Iodomethane	uo/L	5	<5

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

VOCs in Water (continued)

Method: ME-(AU)-ENVJAN433

Sample Number		Parameter	Units	LOR	Result
LB222924.001	Halogenated Aliphatics	1,1-dichloroethene	µg/L	0.5	<0.5
		Dichloromethane (Methylene chloride)	µg/L	5	<5
		Allyl chloride	µg/L	2	<2
		trans-1,2-dichloroethene	µg/L	0.5	<0.5
		1,1-dichloroethane	µg/L	0.5	<0.5
		cis-1,2-dichloroethene	µg/L	0.5	<0.5
		Bromochloromethane	µg/L	0.5	<0.5
		1,2-dichloroethane	µg/L	0.5	<0.5
		1,1,1-trichloroethane	µg/L	0.5	<0.5
		1,1-dichloropropene	µg/L	0.5	<0.5
		Carbon tetrachloride	µg/L	0.5	<0.5
		Dibromomethane	µg/L	0.5	<0.5
		Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	<0.5
		1,1,2-trichloroethane	µg/L	0.5	<0.5
		1,3-dichloropropane	µg/L	0.5	<0.5
		Tetrachloroethene (Perchloroethylene,PCE)	µg/L	0.5	<0.5
		1,1,1,2-tetrachloroethane	µg/L	0.5	<0.5
		cis-1,4-dichloro-2-butene	µg/L	1	<1
		1,1,2,2-tetrachloroethane	µg/L	0.5	<0.5
		1,2,3-trichloropropane	µg/L	0.5	<0.5
		trans-1,4-dichloro-2-butene	µg/L	1	<1
		1,2-dibromo-3-chloropropane	µg/L	0.5	<0.5
	Halogenated Aromatics	Hexachlorobutadiene	µg/L	0.5	<0.5
		Chlorobenzene	µg/L	0.5	<0.5
		Bromobenzene	µg/L	0.5	<0.5
		2-chlorotoluene	µg/L	0.5	<0.5
		4-chlorotoluene	µg/L	0.5	<0.5
		1,3-dichlorobenzene	µg/L	0.5	<0.5
		1,4-dichlorobenzene	µg/L	0.3	<0.3
		1,2-dichlorobenzene	µg/L	0.5	<0.5
	Monocyclic Aromatic Hydrocarbons	1,2,4-trichlorobenzene	µg/L	0.5	<0.5
		1,2,3-trichlorobenzene	µg/L	0.5	<0.5
		Benzene	µg/L	0.5	<0.5
		Toluene	µg/L	0.5	<0.5
		Ethylbenzene	µg/L	0.5	<0.5
		m/p-xylene	µg/L	1	<1
		Styrene (Vinyl benzene)	µg/L	0.5	<0.5
		o-xylene	µg/L	0.5	<0.5
		Isopropylbenzene (Cumene)	µg/L	0.5	<0.5
		n-propylbenzene	µg/L	0.5	<0.5
		1,3,5-trimethylbenzene	µg/L	0.5	<0.5
	Nitrogenous Compounds	tert-butylbenzene	µg/L	0.5	<0.5
		1,2,4-trimethylbenzene	µg/L	0.5	<0.5
		sec-butylbenzene	µg/L	0.5	<0.5
		p-isopropyltoluene	µg/L	0.5	<0.5
		n-butylbenzene	µg/L	0.5	<0.5
		Acrylonitrile	µg/L	0.5	<0.5
	Oxygenated Compounds	Acetone (2-propanone)	µg/L	10	<10
		MtBE (Methyl-tert-butyl ether)	µg/L	2	<1
		Vinyl acetate	µg/L	10	<10
		MEK (2-butanone)	µg/L	10	<10
		MIBK (4-methyl-2-pentanone)	µg/L	5	<5
		2-hexanone (MBK)	µg/L	5	<5
	Polycyclic VOCs	Naphthalene	µg/L	0.5	<0.5
	Sulphonated	Carbon disulfide	µg/L	2	<2
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	99
		d8-toluene (Surrogate)	%	-	95
		Bromofluorobenzene (Surrogate)	%	-	97
	Trihalomethanes	Chloroform (THM)	µg/L	0.5	<0.5
		Bromodichloromethane (THM)	µg/L	0.5	<0.5
		Dibromochloromethane (THM)	µg/L	0.5	<0.5

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

VOCs in Water (continued)

Method: ME-(AU)-[ENV]AN433

Sample Number	Parameter	Units	LOR	Result
LB222924.001	Trihalomethanes	Bromoform (THM)	µg/L	0.5

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Sample Number	Parameter	Units	LOR	Result
LB222924.001	TRH C6-C9	µg/L	40	<40
	d4-1,2-dichloroethane (Surrogate)	%	-	99
	d8-toluene (Surrogate)	%	-	95
	Bromofluorobenzene (Surrogate)	%	-	97

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: $RPD = | \text{OriginalResult} - \text{ReplicateResult} | \times 100 / \text{Mean}$

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: $MAD = 100 \times \text{SDL} / \text{Mean} + \text{LR}$

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-ENVJAN420

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218617.006	LB222820.024	Naphthalene	µg/L	0.1	<0.1	<0.1	200	0
		2-methylnaphthalene	µg/L	0.1	<0.1	<0.1	200	0
		1-methylnaphthalene	µg/L	0.1	<0.1	<0.1	200	0
		Acenaphthylene	µg/L	0.1	<0.1	<0.1	200	0
		Acenaphthene	µg/L	0.1	<0.1	<0.1	200	0
		Fluorene	µg/L	0.1	<0.1	<0.1	200	0
		Phenanthrene	µg/L	0.1	<0.1	<0.1	200	0
		Anthracene	µg/L	0.1	<0.1	<0.1	200	0
		Fluoranthene	µg/L	0.1	<0.1	<0.1	200	0
		Pyrene	µg/L	0.1	<0.1	<0.1	200	0
		Benzo(a)anthracene	µg/L	0.1	<0.1	<0.1	200	0
		Chrysene	µg/L	0.1	<0.1	<0.1	200	0
		Benzo(b&j)fluoranthene	µg/L	0.1	<0.1	<0.1	200	0
		Benzo(k)fluoranthene	µg/L	0.1	<0.1	<0.1	200	0
		Benzo(a)pyrene	µg/L	0.1	<0.1	<0.1	200	0
		Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1	<0.1	200	0
		Dibenzo(ah)anthracene	µg/L	0.1	<0.1	<0.1	200	0
		Benzo(ghi)perylene	µg/L	0.1	<0.1	<0.1	200	0
	Surrogates	d5-nitrobenzene (Surrogate)	µg/L	-	0.2	0.2	30	11
		2-fluorobiphenyl (Surrogate)	µg/L	-	0.3	0.3	30	15
		d14-p-terphenyl (Surrogate)	µg/L	-	0.4	0.4	30	8

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-ENVJAN318

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218657.006	LB222814.014	Lead, Pb	µg/L	1	<1	<1	200	0

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-ENVJAN403

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218617.006	LB222820.024	TRH C10-C14	µg/L	50	<50	<50	200	0
		TRH C15-C28	µg/L	200	<200	<200	200	0
		TRH C29-C36	µg/L	200	<200	<200	200	0
		TRH C37-C40	µg/L	200	<200	<200	200	0
		TRH C10-C40	µg/L	320	<320	<320	200	0
	TRH F Bands	TRH >C10-C16	µg/L	60	<60	<60	200	0
		TRH >C10-C16 - Naphthalene (F2)	µg/L	60	<60	<60	200	0
		TRH >C16-C34 (F3)	µg/L	500	<500	<500	200	0
		TRH >C34-C40 (F4)	µg/L	500	<500	<500	200	0

VOCs in Water

Method: ME-(AU)-ENVJAN433

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218617.001	LB222924.027	Fumigants						
		2,2-dichloropropane	µg/L	0.5	<0.5	<0.5	200	0
		1,2-dichloropropane	µg/L	0.5	<0.5	<0.5	200	0
		cis-1,3-dichloropropene	µg/L	0.5	<0.5	<0.5	200	0
		trans-1,3-dichloropropene	µg/L	0.5	<0.5	<0.5	200	0
		1,2-dibromoethane (EDB)	µg/L	0.5	<0.5	<0.5	200	0
	Halogenated	Dichlorodifluoromethane (CFC-12)	µg/L	5	<5	<5	200	0
	Aliphatics	Chloromethane	µg/L	5	<5	<5	200	0
		Vinyl chloride (Chloroethene)	µg/L	0.3	<0.3	<0.3	200	0
		Bromomethane	µg/L	10	<10	<10	200	0
		Chloroethane	µg/L	5	<5	<5	200	0
		Trichlorofluoromethane	µg/L	1	<1	<1	200	0
		Iodomethane	µg/L	5	<5	<5	200	0
		1,1-dichloroethene	µg/L	0.5	<0.5	<0.5	200	0
		Dichloromethane (Methylene chloride)	µg/L	5	<5	<5	200	0
		Allyl chloride	µg/L	2	<2	<2	200	0
		trans-1,2-dichloroethene	µg/L	0.5	<0.5	<0.5	200	0
		1,1-dichloroethane	µg/L	0.5	<0.5	<0.5	200	0
		cis-1,2-dichloroethene	µg/L	0.5	<0.5	<0.5	200	0
		Bromochloromethane	µg/L	0.5	<0.5	<0.5	200	0
		1,2-dichloroethane	µg/L	0.5	<0.5	<0.5	200	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: $RPD = | \text{OriginalResult} - \text{ReplicateResult} | \times 100 / \text{Mean}$

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: $MAD = 100 \times \text{SDL} / \text{Mean} + \text{LR}$

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

VOCs in Water (continued)

Method: ME-(AU)-ENVJAN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %	
SE218617.001	LB222924.027	Halogenated Aliphatics	1,1,1-trichloroethane	µg/L	0.5	<0.5	<0.5	200	0	
			1,1-dichloropropene	µg/L	0.5	<0.5	<0.5	200	0	
		Carbon tetrachloride	µg/L	0.5	<0.5	<0.5	200	0		
		Dibromomethane	µg/L	0.5	<0.5	<0.5	200	0		
		Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	<0.5	<0.5	200	0		
		1,1,2-trichloroethane	µg/L	0.5	<0.5	<0.5	200	0		
		1,3-dichloropropane	µg/L	0.5	<0.5	<0.5	200	0		
		Tetrachloroethene (Perchloroethylene,PCE)	µg/L	0.5	<0.5	<0.5	200	0		
		1,1,1,2-tetrachloroethane	µg/L	0.5	<0.5	<0.5	200	0		
		cis-1,4-dichloro-2-butene	µg/L	1	<1	<1	200	0		
		1,1,2,2-tetrachloroethane	µg/L	0.5	<0.5	<0.5	200	0		
		1,2,3-trichloropropane	µg/L	0.5	<0.5	<0.5	200	0		
		trans-1,4-dichloro-2-butene	µg/L	1	<1	<1	200	0		
		1,2-dibromo-3-chloropropane	µg/L	0.5	<0.5	<0.5	200	0		
		Hexachlorobutadiene	µg/L	0.5	<0.5	<0.5	200	0		
		Halogenated Aromatics	Chlorobenzene	µg/L	0.5	<0.5	<0.5	200	0	
			Bromobenzene	µg/L	0.5	<0.5	<0.5	200	0	
			2-chlorotoluene	µg/L	0.5	<0.5	<0.5	200	0	
			4-chlorotoluene	µg/L	0.5	<0.5	<0.5	200	0	
			1,3-dichlorobenzene	µg/L	0.5	<0.5	<0.5	200	0	
			1,4-dichlorobenzene	µg/L	0.3	<0.3	<0.3	200	0	
			1,2-dichlorobenzene	µg/L	0.5	<0.5	<0.5	200	0	
			1,2,4-trichlorobenzene	µg/L	0.5	<0.5	<0.5	200	0	
			1,2,3-trichlorobenzene	µg/L	0.5	<0.5	<0.5	200	0	
			Monocyclic Aromatic	Benzene	µg/L	0.5	<0.5	<0.5	200	0
		Toluene		µg/L	0.5	<0.5	<0.5	200	0	
		Ethylbenzene		µg/L	0.5	<0.5	<0.5	200	0	
		m/p-xylene		µg/L	1	<1	<1	200	0	
		Styrene (Vinyl benzene)		µg/L	0.5	<0.5	<0.5	200	0	
		o-xylene		µg/L	0.5	<0.5	<0.5	200	0	
		Isopropylbenzene (Cumene)		µg/L	0.5	<0.5	<0.5	200	0	
		n-propylbenzene		µg/L	0.5	<0.5	<0.5	200	0	
		1,3,5-trimethylbenzene		µg/L	0.5	<0.5	<0.5	200	0	
		tert-butylbenzene		µg/L	0.5	<0.5	<0.5	200	0	
		1,2,4-trimethylbenzene		µg/L	0.5	<0.5	<0.5	200	0	
		sec-butylbenzene		µg/L	0.5	<0.5	<0.5	200	0	
		p-isopropyltoluene		µg/L	0.5	<0.5	<0.5	200	0	
		n-butylbenzene		µg/L	0.5	<0.5	<0.5	200	0	
		Nitrogenous		Acrylonitrile	µg/L	0.5	<0.5	<0.5	200	0
		Oxygenated Compounds		Acetone (2-propanone)	µg/L	10	<10	<10	200	0
			MtBE (Methyl-tert-butyl ether)	µg/L	2	<2	<0.5	200	0	
			Vinyl acetate	µg/L	10	<10	<10	200	0	
			MEK (2-butanone)	µg/L	10	<10	<10	200	0	
			MIBK (4-methyl-2-pentanone)	µg/L	5	<5	<5	200	0	
			2-hexanone (MBK)	µg/L	5	<5	<5	200	0	
		Polycyclic	Naphthalene	µg/L	0.5	<0.5	<0.5	200	0	
		Sulphonated	Carbon disulfide	µg/L	2	<2	<2	200	0	
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.3	9.6	30	6	
			d8-toluene (Surrogate)	µg/L	-	9.7	9.6	30	1	
			Bromofluorobenzene (Surrogate)	µg/L	-	9.8	9.4	30	4	
		Trihalomethanes	Chloroform (THM)	µg/L	0.5	<0.5	<0.5	200	0	
			Bromodichloromethane (THM)	µg/L	0.5	<0.5	<0.5	200	0	
			Dibromochloromethane (THM)	µg/L	0.5	<0.5	<0.5	200	0	
			Bromoform (THM)	µg/L	0.5	<0.5	<0.5	200	0	
SE218680.003	LB222924.028	Fumigants	2,2-dichloropropane	µg/L	0.5	<0.5	<0.5	200	0	
			1,2-dichloropropane	µg/L	0.5	<0.5	<0.5	200	0	
			cis-1,3-dichloropropene	µg/L	0.5	<0.5	<0.5	200	0	
			trans-1,3-dichloropropene	µg/L	0.5	<0.5	<0.5	200	0	
			1,2-dibromoethane (EDB)	µg/L	0.5	<0.5	<0.5	200	0	
		Halogenated Aliphatics	Dichlorodifluoromethane (CFC-12)	µg/L	5	<5	<5	200	0	
			Chloromethane	µg/L	5	<5	<5	200	0	

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: $RPD = | \text{OriginalResult} - \text{ReplicateResult} | \times 100 / \text{Mean}$

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: $MAD = 100 \times \text{SDL} / \text{Mean} + \text{LR}$

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

VOCs in Water (continued)

Method: ME-(AU)-ENVJAN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218680.003	LB222924.028	Halogenated	Vinyl chloride (Chloroethene)	µg/L	0.3	<0.3	<0.3	200	0
		Aliphatics	Bromomethane	µg/L	10	<10	<10	200	0
			Chloroethane	µg/L	5	<5	<5	200	0
			Trichlorofluoromethane	µg/L	1	<1	<1	200	0
			Iodomethane	µg/L	5	<5	<5	200	0
			1,1-dichloroethene	µg/L	0.5	<0.5	<0.5	200	0
			Dichloromethane (Methylene chloride)	µg/L	5	<5	<5	200	0
			Allyl chloride	µg/L	2	<2	<2	200	0
			trans-1,2-dichloroethene	µg/L	0.5	<0.5	<0.5	200	0
			1,1-dichloroethane	µg/L	0.5	<0.5	<0.5	200	0
			cis-1,2-dichloroethene	µg/L	0.5	<0.5	<0.5	200	0
			Bromochloromethane	µg/L	0.5	<0.5	<0.5	200	0
			1,2-dichloroethane	µg/L	0.5	<0.5	<0.5	200	0
			1,1,1-trichloroethane	µg/L	0.5	<0.5	<0.5	200	0
			1,1-dichloropropene	µg/L	0.5	<0.5	<0.5	200	0
			Carbon tetrachloride	µg/L	0.5	<0.5	<0.5	200	0
			Dibromomethane	µg/L	0.5	<0.5	<0.5	200	0
			Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	<0.5	<0.5	200	0
			1,1,2-trichloroethane	µg/L	0.5	<0.5	<0.5	200	0
			1,3-dichloropropane	µg/L	0.5	<0.5	<0.5	200	0
			Tetrachloroethene (Perchloroethylene,PCE)	µg/L	0.5	<0.5	<0.5	200	0
			1,1,1,2-tetrachloroethane	µg/L	0.5	<0.5	<0.5	200	0
			cis-1,4-dichloro-2-butene	µg/L	1	<1	<1	200	0
			1,1,2,2-tetrachloroethane	µg/L	0.5	<0.5	<0.5	200	0
			1,2,3-trichloropropane	µg/L	0.5	<0.5	<0.5	200	0
			trans-1,4-dichloro-2-butene	µg/L	1	<1	<1	200	0
			1,2-dibromo-3-chloropropane	µg/L	0.5	<0.5	<0.5	200	0
			Hexachlorobutadiene	µg/L	0.5	<0.5	<0.5	200	0
		Halogenated	Chlorobenzene	µg/L	0.5	<0.5	<0.5	200	0
		Aromatics	Bromobenzene	µg/L	0.5	<0.5	<0.5	200	0
			2-chlorotoluene	µg/L	0.5	<0.5	<0.5	200	0
			4-chlorotoluene	µg/L	0.5	<0.5	<0.5	200	0
			1,3-dichlorobenzene	µg/L	0.5	<0.5	<0.5	200	0
			1,4-dichlorobenzene	µg/L	0.3	<0.3	<0.3	200	0
			1,2-dichlorobenzene	µg/L	0.5	<0.5	<0.5	200	0
			1,2,4-trichlorobenzene	µg/L	0.5	<0.5	<0.5	200	0
			1,2,3-trichlorobenzene	µg/L	0.5	<0.5	<0.5	200	0
		Monocyclic	Benzene	µg/L	0.5	<0.5	<0.5	200	0
		Aromatic	Toluene	µg/L	0.5	<0.5	<0.5	160	0
			Ethylbenzene	µg/L	0.5	<0.5	<0.5	200	0
			m/p-xylene	µg/L	1	<1	<1	200	0
			Styrene (Vinyl benzene)	µg/L	0.5	<0.5	<0.5	200	0
			o-xylene	µg/L	0.5	<0.5	<0.5	200	0
			Isopropylbenzene (Cumene)	µg/L	0.5	<0.5	<0.5	200	0
			n-propylbenzene	µg/L	0.5	<0.5	<0.5	200	0
			1,3,5-trimethylbenzene	µg/L	0.5	<0.5	<0.5	200	0
			tert-butylbenzene	µg/L	0.5	<0.5	<0.5	200	0
			1,2,4-trimethylbenzene	µg/L	0.5	<0.5	<0.5	200	0
			sec-butylbenzene	µg/L	0.5	<0.5	<0.5	200	0
			p-isopropyltoluene	µg/L	0.5	<0.5	<0.5	200	0
			n-butylbenzene	µg/L	0.5	<0.5	<0.5	200	0
		Nitrogenous	Acrylonitrile	µg/L	0.5	<0.5	<0.5	200	0
		Oxygenated	Acetone (2-propanone)	µg/L	10	<10	<10	200	0
		Compounds	MtBE (Methyl-tert-butyl ether)	µg/L	2	<2	<0.5	200	0
			Vinyl acetate	µg/L	10	<10	<10	200	0
			MEK (2-butanone)	µg/L	10	<10	<10	200	0
			MIBK (4-methyl-2-pentanone)	µg/L	5	<5	<5	200	0
			2-hexanone (MBK)	µg/L	5	<5	<5	200	0
		Polycyclic	Naphthalene	µg/L	0.5	<0.5	<0.5	200	0
		Sulphonated	Carbon disulfide	µg/L	2	<2	<2	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.5	10.0	30	5

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: $RPD = | \text{OriginalResult} - \text{ReplicateResult} | \times 100 / \text{Mean}$

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: $MAD = 100 \times \text{SDL} / \text{Mean} + \text{LR}$

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

VOCs in Water (continued)

Method: ME-(AU)-ENVJAN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218680.003	LB222924.028	Surrogates	d8-toluene (Surrogate)	µg/L	-	9.8	9.7	30	1
			Bromofluorobenzene (Surrogate)	µg/L	-	9.9	9.7	30	2
		Trihalomethanes	Chloroform (THM)	µg/L	0.5	<0.5	<0.5	200	0
			Bromodichloromethane (THM)	µg/L	0.5	<0.5	<0.5	200	0
			Dibromochloromethane (THM)	µg/L	0.5	<0.5	<0.5	200	0
			Bromoform (THM)	µg/L	0.5	<0.5	<0.5	200	0

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-ENVJAN433

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %	
SE218617.001	LB222924.027	TRH C6-C10	µg/L	50	<50	<50	200	0	
		TRH C6-C9	µg/L	40	<40	<40	200	0	
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.3	9.6	30	6
			d8-toluene (Surrogate)	µg/L	-	9.7	9.6	30	1
			Bromofluorobenzene (Surrogate)	µg/L	-	9.8	9.4	30	4
		VPH F Bands	Benzene (F0)	µg/L	0.5	<0.5	<0.5	200	0
	TRH C6-C10 minus BTEX (F1)	µg/L	50	<50	<50	200	0		
SE218680.003	LB222924.028	TRH C6-C10	µg/L	50	<50	<50	200	0	
		TRH C6-C9	µg/L	40	<40	<40	200	0	
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.5	10.0	30	5
			d8-toluene (Surrogate)	µg/L	-	9.8	9.7	30	1
			Bromofluorobenzene (Surrogate)	µg/L	-	9.9	9.7	30	2
		VPH F Bands	Benzene (F0)	µg/L	0.5	<0.5	<0.5	200	0
			TRH C6-C10 minus BTEX (F1)	µg/L	50	<50	<50	200	0

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Anions by Ion Chromatography in Water

Method: ME-(AU)-[ENV]JAN245

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB222913.002	Fluoride	mg/L	0.1	2.0	2	80 - 120	98

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]JAN420

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB222820.002	Naphthalene	µg/L	0.1	27	40	60 - 140	67
	Acenaphthylene	µg/L	0.1	27	40	60 - 140	67
	Acenaphthene	µg/L	0.1	27	40	60 - 140	67
	Phenanthrene	µg/L	0.1	29	40	60 - 140	71
	Anthracene	µg/L	0.1	30	40	60 - 140	76
	Fluoranthene	µg/L	0.1	28	40	60 - 140	71
	Pyrene	µg/L	0.1	30	40	60 - 140	75
	Benzo(a)pyrene	µg/L	0.1	29	40	60 - 140	71
	Surrogates						
	d5-nitrobenzene (Surrogate)	µg/L	-	0.3	0.5	40 - 130	52
	2-fluorobiphenyl (Surrogate)	µg/L	-	0.3	0.5	40 - 130	64
	d14-p-terphenyl (Surrogate)	µg/L	-	0.3	0.5	40 - 130	66

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]JAN318

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB222814.002	Arsenic, As	µg/L	1	19	20	80 - 120	95
	Cadmium, Cd	µg/L	0.1	20	20	80 - 120	102
	Chromium, Cr	µg/L	1	21	20	80 - 120	103
	Copper, Cu	µg/L	1	21	20	80 - 120	106
	Lead, Pb	µg/L	1	22	20	80 - 120	111
	Nickel, Ni	µg/L	1	21	20	80 - 120	107
	Zinc, Zn	µg/L	5	22	20	80 - 120	111

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]JAN403

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB222820.002	TRH C10-C14	µg/L	50	1200	1200	60 - 140	96
	TRH C15-C28	µg/L	200	1400	1200	60 - 140	115
	TRH C29-C36	µg/L	200	1400	1200	60 - 140	121
	TRH F Bands						
	TRH >C10-C16	µg/L	60	1300	1200	60 - 140	108
	TRH >C16-C34 (F3)	µg/L	500	1400	1200	60 - 140	113
	TRH >C34-C40 (F4)	µg/L	500	770	600	60 - 140	128

VOCs in Water

Method: ME-(AU)-[ENV]JAN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB222924.002	Halogenated	1,1-dichloroethene	µg/L	0.5	49	45.45	60 - 140	107
	Aliphatics	1,2-dichloroethane	µg/L	0.5	51	45.45	60 - 140	113
		Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	50	45.45	60 - 140	109
	Halogenated	Chlorobenzene	µg/L	0.5	53	45.45	60 - 140	117
	Monocyclic	Benzene	µg/L	0.5	42	45.45	60 - 140	92
	Aromatic	Toluene	µg/L	0.5	46	45.45	60 - 140	102
		Ethylbenzene	µg/L	0.5	48	45.45	60 - 140	106
		m/p-xylene	µg/L	1	97	90.9	60 - 140	106
		o-xylene	µg/L	0.5	48	45.45	60 - 140	106
	Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.5	10	60 - 140	105
		d8-toluene (Surrogate)	µg/L	-	10.0	10	70 - 130	100
		Bromofluorobenzene (Surrogate)	µg/L	-	9.8	10	70 - 130	98
	Trihalomethan	Chloroform (THM)	µg/L	0.5	54	45.45	60 - 140	118

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]JAN433

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB222924.002	TRH C6-C10	µg/L	50	780	946.63	60 - 140	83
	TRH C6-C9	µg/L	40	690	818.71	60 - 140	84
	Surrogates						
	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.5	10	60 - 140	105
	d8-toluene (Surrogate)	µg/L	-	10.0	10	70 - 130	100
	Bromofluorobenzene (Surrogate)	µg/L	-	9.8	10	70 - 130	98
	VPH F Bands						
	TRH C6-C10 minus BTEX (F1)	µg/L	50	500	639.67	60 - 140	79

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub-sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Anions by Ion Chromatography in Water

Method: ME-(AU)-[ENV]AN245

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE218617.008	LB222913.018	Fluoride	mg/L	0.1	2.0	0.15	2	91

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE218617.001	LB222817.004	Mercury	mg/L	0.0001	0.0018	<0.0001	0.008	91

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE218567RE.0	LB222814.004	Zinc, Zn	µg/L	5	560	540	20	119

VOCs in Water

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE218680.004	LB222924.029	Monocyclic	Benzene	µg/L	0.5	44	<0.5	45.45	96
			Aromatic	Toluene	µg/L	0.5	46	<0.5	45.45
		Ethylbenzene		µg/L	0.5	47	<0.5	45.45	104
		m/p-xylene		µg/L	1	95	<1	90.9	104
		o-xylene		µg/L	0.5	48	<0.5	45.45	105
		Polycyclic	Naphthalene	µg/L	0.5	47	<0.5	-	-
			Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	0.0	10.4	-
		d8-toluene (Surrogate)		µg/L	-	0.0	9.7	-	100
		Bromofluorobenzene (Surrogate)		µg/L	-	0.0	9.8	-	97

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%	
SE218680.004	LB222924.029	TRH C6-C10	µg/L	50	720	<50	946.63	76	
		TRH C6-C9	µg/L	40	650	<40	818.71	79	
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	0.0	10.4	-	98
			d8-toluene (Surrogate)	µg/L	-	0.0	9.7	-	100
			Bromofluorobenzene (Surrogate)	µg/L	-	0.0	9.8	-	97
			VPH F	Benzene (F0)	µg/L	0.5		<0.5	-
		TRH C6-C10 minus BTEX (F1)		µg/L	50	440	<50	639.67	69
		Bands							

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: $RPD = | \text{OriginalResult} - \text{ReplicateResult} | \times 100 / \text{Mean}$

The original result is the analyte concentration of the matrix spike. The Duplicate result is the analyte concentration of the matrix spike duplicate.

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: $MAD = 100 \times \text{SDL} / \text{Mean} + \text{LR}$

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

QC criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found here : https://www.sgs.com.au/~media/Local/Australia/Documents/Technical Documents/MP-AU-ENV-QU-022_QA_QC_Plan.pdf

- * NATA accreditation does not cover the performance of this service.
- ** Indicative data, theoretical holding time exceeded.
- *** Indicates that both * and ** apply.
- Sample not analysed for this analyte.
- IS Insufficient sample for analysis.
- LNR Sample listed, but not received.
- LOR Limit of reporting.
- QFH QC result is above the upper tolerance.
- QFL QC result is below the lower tolerance.
- ① At least 2 of 3 surrogates are within acceptance criteria.
- ② RPD failed acceptance criteria due to sample heterogeneity.
- ③ Results less than 5 times LOR preclude acceptance criteria for RPD.
- ④ Recovery failed acceptance criteria due to matrix interference.
- ⑤ Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
- ⑥ LOR was raised due to sample matrix interference.
- ⑦ LOR was raised due to dilution of significantly high concentration of analyte in sample.
- ⑧ Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
- ⑨ Recovery failed acceptance criteria due to sample heterogeneity.
- ⑩ LOR was raised due to high conductivity of the sample (required dilution).
- † Refer to relevant report comments for further information.

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Yin, Emily (Sydney)

From: james@jmenvironments.com
Sent: Monday, 26 April 2021 1:25 PM
To: AU.SampleReceipt.Sydney (Sydney)
Cc: AU.Environmental.Sydney (Sydney)
Subject: [EXTERNAL] RE: Report Job SE218617, your reference JME20006, order number JME20006

*** WARNING: this message is from an EXTERNAL SENDER. Please be cautious, particularly with links and attachments. ***

Hi All,

Any chance I could get the dissolved aluminium results as well?

Kind Regards

James McMahon
0427 893 668
james@jmenvironments.com
Licenced Asbestos Assessor LAA001286
Certified Environmental Practitioner CEnvP 1235
Site Contamination Specialist SC41110

SGS EHS Alexandria Laboratory



SE218617A COC
Received: 26 – Apr – 2021



From: AU.SampleReceipt.Sydney@SGS.com <AU.SampleReceipt.Sydney@SGS.com>
Sent: Thursday, 22 April 2021 2:40 PM
To: james@jmenvironments.com
Subject: Report Job SE218617, your reference JME20006, order number JME20006

Dear Valued Customer,

Please find attached the report for SGS job SE218617, your reference JME20006, order number JME20006.

How are we doing? Please take a quick online [Survey](#)

If you have any questions or concerns, please don't hesitate to contact your SGS Client Services representative.

Best Regards,
SGS Alexandria Customer Service Team
SGS Australia Pty Ltd
Phone: +61 (0)2 8594 0400

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SAMPLE RECEIPT ADVICE

SE218617A

CLIENT DETAILS

Contact James McMahon
Client JM ENVIRONMENTS
Address 37 TOOKE STREET
COOKS HILL NSW 2300

Telephone 0427 893 668
Facsimile (Not specified)
Email james@jmenvironments.com

Project JME20006 - Additions
Order Number JME20006
Samples 8

LABORATORY DETAILS

Manager Huong Crawford
Laboratory SGS Alexandria Environmental
Address Unit 16, 33 Maddox St
Alexandria NSW 2015

Telephone +61 2 8594 0400
Facsimile +61 2 8594 0499
Email au.environmental.sydney@sgs.com

Samples Received Mon 26/4/2021
Report Due Tue 27/4/2021
SGS Reference SE218617A

SUBMISSION DETAILS

This is to confirm that 8 samples were received on Monday 26/4/2021. Results are expected to be ready by COB Tuesday 27/4/2021. Please quote SGS reference SE218617A when making enquiries. Refer below for details relating to sample integrity upon receipt.

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice
Samples received in correct containers	Yes	Sample counts by matrix	8 Water
Date documentation received	26/4/2021@1:25pm	Type of documentation received	Email
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	3.1°C	Sufficient sample for analysis	Yes
Turnaround time requested	Next Day		

Unless otherwise instructed, water and bulk samples will be held for one month from date of report, and soil samples will be held for two months.

COMMENTS

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SAMPLE RECEIPT ADVICE

SE218617A

CLIENT DETAILS

Client **JM ENVIRONMENTS**

Project **JME20006 - Additionsl**

SUMMARY OF ANALYSIS

No.	Sample ID	Trace Metals (Dissolved) in Water by ICPMS
001	MW4	1
002	MW5	1
003	MW6	1
004	MW7	1
005	MW8	1
006	MW9	1
007	QC1	1
008	QC1A	1

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.

The numbers shown in the table indicate the number of results requested in each package.

Please indicate as soon as possible should your request differ from these details .

Testing as per this table shall commence immediately unless the client intervenes with a correction .

CLIENT DETAILS

Contact James McMahon
Client JM ENVIRONMENTS
Address 37 TOOKE STREET
 COOKS HILL NSW 2300

Telephone 0427 893 668
Facsimile (Not specified)
Email james@jmenvironments.com
Project **JME20006 - Additional**
Order Number **JME20006**
Samples 8

LABORATORY DETAILS

Manager Huong Crawford
Laboratory SGS Alexandria Environmental
Address Unit 16, 33 Maddox St
 Alexandria NSW 2015

Telephone +61 2 8594 0400
Facsimile +61 2 8594 0499
Email au.environmental.sydney@sgs.com
SGS Reference **SE218617A R0**
Date Received 26/4/2021
Date Reported 26/4/2021

COMMENTS

Accredited for compliance with ISO/IEC 17025 - Testing. NATA accredited laboratory 2562(4354).

SIGNATORIES



Dong LIANG
 Metals/Inorganics Team Leader

Trace Metals (Dissolved) in Water by ICPMS [AN318] Tested: 26/4/2021

			MW4	MW5	MW6	MW7	MW8
			WATER - 13/4/2021 SE218617A.001	WATER - 13/4/2021 SE218617A.002	WATER - 13/4/2021 SE218617A.003	WATER - 13/4/2021 SE218617A.004	WATER - 13/4/2021 SE218617A.005
PARAMETER	UOM	LOR					
Aluminium, Al	µg/L	5	770	270	7100	250	190

			MW9	QC1	QC1A
			WATER - 13/4/2021 SE218617A.006	WATER - 13/4/2021 SE218617A.007	WATER - 13/4/2021 SE218617A.008
PARAMETER	UOM	LOR			
Aluminium, Al	µg/L	5	8800	260	240

METHOD

METHODOLOGY SUMMARY

AN020

Unpreserved water sample is filtered through a 0.45µm membrane filter and acidified with nitric acid similar to APHA3030B.

AN318

Determination of elements at trace level in waters by ICP-MS technique,, referenced to USEPA 6020B and USEPA 200.8 (5.4).

FOOTNOTES

*	NATA accreditation does not cover the performance of this service.	-	Not analysed.	UOM	Unit of Measure.
**	Indicative data, theoretical holding time exceeded.	NVL	Not validated.	LOR	Limit of Reporting.
***	Indicates that both * and ** apply.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the "Total" LOR will be the sum of those two LORs.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.

Note that in terms of units of radioactivity:

- 1 Bq is equivalent to 27 pCi
- 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au/en-gb/environment-health-and-safety.

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STATEMENT OF QA/QC PERFORMANCE

SE218617A R0

CLIENT DETAILS

Contact James McMahon
Client JM ENVIRONMENTS
Address 37 TOOKE STREET
COOKS HILL NSW 2300

Telephone 0427 893 668
Facsimile (Not specified)
Email james@jmenvironments.com

Project **JME20006 - Additional**
Order Number **JME20006**
Samples 8

LABORATORY DETAILS

Manager Huong Crawford
Laboratory SGS Alexandria Environmental
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Alexandria NSW 2015

Telephone +61 2 8594 0400
Facsimile +61 2 8594 0499
Email au.environmental.sydney@sgs.com

SGS Reference **SE218617A R0**
Date Received 26 Apr 2021
Date Reported 26 Apr 2021

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS' stated Data Quality Objectives (DQO). Comments arising from the comparison were made and are reported below.

The data relating to sampling was taken from the Chain of Custody document.

This QA/QC Statement must be read in conjunction with the referenced Analytical Report.

The Statement and the Analytical Report must not be reproduced except in full.

All Data Quality Objectives were met (within the SGS Alexandria Environmental laboratory).

SAMPLE SUMMARY

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-ENVJAN318

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW4	SE218617A.001	LB223349	13 Apr 2021	26 Apr 2021	10 Oct 2021	26 Apr 2021	10 Oct 2021	26 Apr 2021
MW5	SE218617A.002	LB223349	13 Apr 2021	26 Apr 2021	10 Oct 2021	26 Apr 2021	10 Oct 2021	26 Apr 2021
MW6	SE218617A.003	LB223349	13 Apr 2021	26 Apr 2021	10 Oct 2021	26 Apr 2021	10 Oct 2021	26 Apr 2021
MW7	SE218617A.004	LB223349	13 Apr 2021	26 Apr 2021	10 Oct 2021	26 Apr 2021	10 Oct 2021	26 Apr 2021
MW8	SE218617A.005	LB223349	13 Apr 2021	26 Apr 2021	10 Oct 2021	26 Apr 2021	10 Oct 2021	26 Apr 2021
MW9	SE218617A.006	LB223349	13 Apr 2021	26 Apr 2021	10 Oct 2021	26 Apr 2021	10 Oct 2021	26 Apr 2021
QC1	SE218617A.007	LB223349	13 Apr 2021	26 Apr 2021	10 Oct 2021	26 Apr 2021	10 Oct 2021	26 Apr 2021
QC1A	SE218617A.008	LB223349	13 Apr 2021	26 Apr 2021	10 Oct 2021	26 Apr 2021	10 Oct 2021	26 Apr 2021

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No surrogates were required for this job.

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Trace Metals (Dissolved) in Water by ICPMS**Method: ME-(AU)-[ENV]AN318**

Sample Number	Parameter	Units	LOR	Result
LB223349.001	Aluminium, Al	µg/L	5	<5

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: $RPD = | \text{OriginalResult} - \text{ReplicateResult} | \times 100 / \text{Mean}$

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: $MAD = 100 \times \text{SDL} / \text{Mean} + \text{LR}$

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

No duplicates were required for this job.



LABORATORY CONTROL SAMPLES

SE218617A R0

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB223349.002	Aluminium, Al	µg/L	5	21	20	80 - 120	106

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub-sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No matrix spikes were required for this job.

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: $RPD = | \text{OriginalResult} - \text{ReplicateResult} | \times 100 / \text{Mean}$

The original result is the analyte concentration of the matrix spike. The Duplicate result is the analyte concentration of the matrix spike duplicate.

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: $MAD = 100 \times \text{SDL} / \text{Mean} + \text{LR}$

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

QC criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found here : https://www.sgs.com.au/~media/Local/Australia/Documents/Technical Documents/MP-AU-ENV-QU-022_QA_QC_Plan.pdf

- * NATA accreditation does not cover the performance of this service.
- ** Indicative data, theoretical holding time exceeded.
- *** Indicates that both * and ** apply.
- Sample not analysed for this analyte.
- IS Insufficient sample for analysis.
- LNR Sample listed, but not received.
- LOR Limit of reporting.
- QFH QC result is above the upper tolerance.
- QFL QC result is below the lower tolerance.
- ① At least 2 of 3 surrogates are within acceptance criteria.
- ② RPD failed acceptance criteria due to sample heterogeneity.
- ③ Results less than 5 times LOR preclude acceptance criteria for RPD.
- ④ Recovery failed acceptance criteria due to matrix interference.
- ⑤ Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
- ⑥ LOR was raised due to sample matrix interference.
- ⑦ LOR was raised due to dilution of significantly high concentration of analyte in sample.
- ⑧ Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
- ⑨ Recovery failed acceptance criteria due to sample heterogeneity.
- ⑩ LOR was raised due to high conductivity of the sample (required dilution).
- † Refer to relevant report comments for further information.

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CHAIN OF CUSTODY & ANALYSIS REQUEST

Sample Date:

11/06/2021

Page 1 of 1

SGS Environmental Services Sydney
Unit 16, 33 Maddox Street
Alexandria NSW 2015
Facsimile No: (02) 85940499
Telephone No: (02) 85940400
Email:
au.samplereceipt.sydney@sgs.com

Company Name:	JM Environments	Project Name/No:	
Address:	37 Tooke St	Purchase Order No:	
	COOKS HILL NSW 2300	Results Required By:	
Contact Name:	James McMahon	Email:	
Telephone	0427 893 668	Email:	

Date /Time: 15/6/2021 4pm

Received by:

Relinquished by:

Received by:

Samples intact: Yes/No

Temperature:

Sample Cooler Sealed: Yes/No

Laboratory Quotation: ENV1126319

Lab Sample ID	Sample ID	Water	Soil	Other	Preservative	No. of Containers	pH/CEC	BTEX/TPH/PAH/ 8HM	8HM	OCP/PCB	Asbestos	PFAS	Comments
1	HA1-3		X			2		X				X	
2	HA2-3		X			2		X				X	
3	HA3-1		X			1				X		X	
4	HA3-2		X			1						X	
5	HA4-0		X			1						X	
6	HA4-1		X			1						X	
7	HA4-2		X			1						X	
8	MW4		X			4			X			X	
9	MW5		X			4			X			X	
10	MW6		X			4			X			X	
11	MW7		X			4			X			X	
12	MW8		X			3			X			X	
13	MW9		X			4			X			X	
14	MW10		X			4			X			X	
15	QC1		X									X	
16	QC2		X									X	
17	QC3		X									X	
18	QCD		X									X	

SGS EHS Sydney COC

SE220737





SAMPLE RECEIPT ADVICE

SE220737

CLIENT DETAILS

Contact James McMahon
Client JM ENVIRONMENTS
Address 37 TOOKE STREET
COOKS HILL NSW 2300

Telephone 0427 893 668
Facsimile (Not specified)
Email james@jmenvironments.com

Project JME20005-6
Order Number JME20005-6
Samples 18

LABORATORY DETAILS

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Laboratory SGS Alexandria Environmental
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Alexandria NSW 2015

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Facsimile +61 2 8594 0499
Email au.environmental.sydney@sgs.com

Samples Received Wed 16/6/2021
Report Due Wed 23/6/2021
SGS Reference SE220737

SUBMISSION DETAILS

This is to confirm that 18 samples were received on Wednesday 16/6/2021. Results are expected to be ready by COB Wednesday 23/6/2021. Please quote SGS reference SE220737 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice
Samples received in correct containers	Yes	Sample counts by matrix	8 Soil, 10 Water
Date documentation received	16/6/2021	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	5°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

Unless otherwise instructed, water and bulk samples will be held for one month from date of report, and soil samples will be held for two months.

COMMENTS

PFAS subcontracted to SGS Melbourne, 10/585 Blackburn Road, Notting Hill, VIC, NATA Accreditation Numbe. 2562/14420.

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SAMPLE RECEIPT ADVICE

SE220737

CLIENT DETAILS

Client **JM ENVIRONMENTS**

Project **JME20005-6**

SUMMARY OF ANALYSIS

No.	Sample ID	OC Pesticides in Soil	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	PCBs in Soil	Total Recoverable Elements in Soil/Waste	TRH (Total Recoverable Hydrocarbons) in Soil	VOC's in Soil	Volatile Petroleum Hydrocarbons in Soil
001	HA1-3	-	26	-	7	10	11	7
002	HA2-3	29	26	11	7	10	11	7
015	QC1	-	26	-	7	10	11	7

CONTINUED OVERLEAF

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

CLIENT DETAILS

Client **JM ENVIRONMENTS**

Project **JME20005-6**

SUMMARY OF ANALYSIS

No.	Sample ID	Mercury (dissolved) in Water	Mercury in Soil	Moisture Content	Per- and Polyfluoroalkyl Substances (PFAS) in	Trace Metals (Dissolved) in Water by ICPMS
001	HA1-3	-	1	1	56	-
002	HA2-3	-	1	1	56	-
003	HA3-1	-	-	-	56	-
004	HA3-2	-	-	-	56	-
005	HA4-0	-	-	-	56	-
006	HA4-1	-	-	-	56	-
007	HA4-2	-	-	-	56	-
008	MW4	1	-	-	-	7
009	MW5	1	-	-	-	7
010	MW6	1	-	-	-	7
011	MW7	1	-	-	-	7
012	MW8	1	-	-	-	7
013	MW9	1	-	-	-	7
014	MW10	1	-	-	-	7
015	QC1	-	1	1	56	-

CONTINUED OVERLEAF

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.

The numbers shown in the table indicate the number of results requested in each package.

Please indicate as soon as possible should your request differ from these details .

Testing as per this table shall commence immediately unless the client intervenes with a correction .



SAMPLE RECEIPT ADVICE

SE220737

CLIENT DETAILS

Client **JM ENVIRONMENTS**

Project **JME20005-6**

SUMMARY OF ANALYSIS

No.	Sample ID	Per- and Polyfluoroalkyl Substances (PFAS) in
008	MW4	56
009	MW5	56
010	MW6	56
011	MW7	56
012	MW8	56
013	MW9	56
014	MW10	56
016	QC2	56
017	QCC	56
018	QCD	56

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.

The numbers shown in the table indicate the number of results requested in each package.

Please indicate as soon as possible should your request differ from these details .

Testing as per this table shall commence immediately unless the client intervenes with a correction .

CLIENT DETAILS

Contact James McMahon
 Client JM ENVIRONMENTS
 Address 37 TOOKE STREET
 COOKS HILL NSW 2300

Telephone 0427 893 668
 Facsimile (Not specified)
 Email james@jmenvironments.com

Project JME20005-6
 Order Number JME20005-6
 Samples 18

LABORATORY DETAILS

Manager Huong Crawford
 Laboratory SGS Alexandria Environmental
 Address Unit 16, 33 Maddox St
 Alexandria NSW 2015

Telephone +61 2 8594 0400
 Facsimile +61 2 8594 0499
 Email au.environmental.sydney@sgs.com

SGS Reference SE220737 R0
 Date Received 16/6/2021
 Date Reported 23/6/2021

COMMENTS

Accredited for compliance with ISO/IEC 17025 - Testing. NATA accredited laboratory 2562(4354).

PFAS subcontracted to SGS Melbourne, 10/585 Blackburn Road, Notting Hill, VIC, NATA Accreditation Numbe. 2562/14420.

MA1523: Some surrogate recovery is outside of the acceptance criteria due to sample matrix interference.

MA1523: LCS recoveries were good for all compounds except PFTrDA.

SIGNATORIES



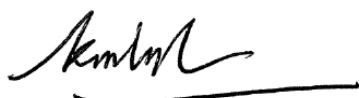
Akheeqar BENIAEMEEN
 Chemist



Dong LIANG
 Metals/Inorganics Team Leader



Kamrul AHSAN
 Senior Chemist



Ly Kim HA
 Organic Section Head



Shane MCDERMOTT
 Inorganic/Metals Chemist



Teresa NGUYEN
 Organic Chemist

VOC's in Soil [AN433] Tested: 17/6/2021

PARAMETER	UOM	LOR	HA1-3	HA2-3	QC1
			SOIL - 11/6/2021 SE220737.001	SOIL - 11/6/2021 SE220737.002	SOIL - 11/6/2021 SE220737.015
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1

Volatile Petroleum Hydrocarbons in Soil [AN433] Tested: 17/6/2021

PARAMETER	UOM	LOR	HA1-3	HA2-3	QC1
			SOIL - 11/6/2021 SE220737.001	SOIL - 11/6/2021 SE220737.002	SOIL - 11/6/2021 SE220737.015
TRH C6-C9	mg/kg	20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25

TRH (Total Recoverable Hydrocarbons) in Soil [AN403] Tested: 17/6/2021

PARAMETER	UOM	LOR	HA1-3	HA2-3	QC1
			SOIL - 11/6/2021 SE220737.001	SOIL - 11/6/2021 SE220737.002	SOIL - 11/6/2021 SE220737.015
TRH C10-C14	mg/kg	20	<20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45	<45
TRH C29-C36	mg/kg	45	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100
TRH >C10-C16	mg/kg	25	<25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420] Tested: 17/6/2021

PARAMETER	UOM	LOR	HA1-3	HA2-3	QC1
			SOIL - 11/6/2021 SE220737.001	SOIL - 11/6/2021 SE220737.002	SOIL - 11/6/2021 SE220737.015
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	0.1	0.2
Pyrene	mg/kg	0.1	<0.1	0.1	0.2
Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.1	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	<0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2
Total PAH (18)	mg/kg	0.8	<0.8	<0.8	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	<0.8	<0.8	<0.8

OC Pesticides in Soil [AN420] Tested: 17/6/2021

			HA2-3
			SOIL
			-
			11/6/2021
			SE220737.002
PARAMETER	UOM	LOR	
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1
Lindane	mg/kg	0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1
Aldrin	mg/kg	0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2
Endrin	mg/kg	0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1
Isodrin	mg/kg	0.1	<0.1
Mirex	mg/kg	0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	<1

PCBs in Soil [AN420] Tested: 17/6/2021

			HA2-3
			SOIL
			-
			11/6/2021
			SE220737.002
PARAMETER	UOM	LOR	
Arochlor 1016	mg/kg	0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 21/6/2021

PARAMETER	UOM	LOR	HA1-3	HA2-3	QC1
			SOIL - 11/6/2021 SE220737.001	SOIL - 11/6/2021 SE220737.002	SOIL - 11/6/2021 SE220737.015
Arsenic, As	mg/kg	1	2	<1	<1
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	8.0	2.9	3.1
Copper, Cu	mg/kg	0.5	7.6	2.4	2.5
Lead, Pb	mg/kg	1	8	4	3
Nickel, Ni	mg/kg	0.5	3.0	1.3	1.3
Zinc, Zn	mg/kg	2	150	100	95

Mercury in Soil [AN312] Tested: 21/6/2021

			HA1-3	HA2-3	QC1
			SOIL	SOIL	SOIL
			-	-	-
			11/6/2021	11/6/2021	11/6/2021
			SE220737.001	SE220737.002	SE220737.015
PARAMETER	UOM	LOR			
Mercury	mg/kg	0.05	<0.05	<0.05	<0.05

Moisture Content [AN002] Tested: 21/6/2021

			HA1-3	HA2-3	QC1
			SOIL	SOIL	SOIL
			-	-	-
			11/6/2021	11/6/2021	11/6/2021
			SE220737.001	SE220737.002	SE220737.015
PARAMETER	UOM	LOR			
% Moisture	%w/w	1	7.3	5.1	6.9

Per- and Polyfluoroalkyl Substances (PFAS) in Solid Samples [MA-1523] Tested: 23/6/2021

PARAMETER	UOM	LOR	HA1-3	HA2-3	HA3-1	HA3-2	HA4-0
			SOIL	SOIL	SOIL	SOIL	SOIL
			11/6/2021 SE220737.001	11/6/2021 SE220737.002	11/6/2021 SE220737.003	11/6/2021 SE220737.004	11/6/2021 SE220737.005
Perfluorobutanoic acid (PFBA)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
Perfluoropentanoic acid (PFPeA)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
Perfluorohexanoic acid (PFHxA)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
Perfluorooctanoic Acid (PFOA)	mg/kg	0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008
Perfluorononanoic acid (PFNA)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
Perfluorodecanoic acid (PFDA)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
Perfluoroundecanoic acid (PFUnA)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
Perfluorododecanoic acid (PFDoA)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
Perfluorohexadecanoic acid (PFHxDA)	mg/kg	0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032
Perfluorobutane sulfonate (PFBS)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
Perfluoropentane sulfonate (PFPeS)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
Perfluorohexane sulfonate (PFHxS)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
Perfluoroheptane sulfonate (PFHpS)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
Perfluorooctane sulfonate (PFOS)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
Sum PFOS and PFHXS	mg/kg	0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
Perfluorononane sulfonate (PFNS)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
Perfluorodecane sulfonate (PFDS)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
Perfluorododecane sulfonate (PFDoS)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
1H,1H,2H,2H-Perfluorohexane sulfonate (4:2) (4:2 FTS)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
1H,1H,2H,2H-Perfluorooctane sulfonate (6:2) (6:2 FTS)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
1H,1H,2H,2H-Perfluorodecane sulfonate (8:2) (8:2 FTS)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
Perfluorooctane sulfonamide (PFOSA)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
N-Methylperfluorooctane sulfonamide (N-MeFOSA)	mg/kg	0.008	<0.008	<0.008	<0.008	<0.008	<0.008
N-Ethylperfluorooctane sulfonamide (N-EtFOSA)	mg/kg	0.008	<0.008	<0.008	<0.008	<0.008	<0.008
2-(N-Methylperfluorooctane sulfonamido)-ethanol	mg/kg	0.016	<0.016	<0.016	<0.016	<0.016	<0.016
2-(N-Ethylperfluorooctane sulfonamido)-ethanol	mg/kg	0.016	<0.016	<0.016	<0.016	<0.016	<0.016
N-Methylperfluorooctanesulfonamidoacetic acid	mg/kg	0.008	<0.008	<0.008	<0.008	<0.008	<0.008
N-Ethylperfluorooctanesulfonamidoacetic Acid	mg/kg	0.008	<0.008	<0.008	<0.008	<0.008	<0.008
Total of PFAS (n=30)	mg/kg	0.08	<0.08	<0.08	<0.08	<0.08	<0.08

Per- and Polyfluoroalkyl Substances (PFAS) in Solid Samples [MA-1523] Tested: 23/6/2021 (continued)

PARAMETER	UOM	LOR	HA4-1	HA4-2	QC1
			SOIL - 11/6/2021 SE220737.006	SOIL - 11/6/2021 SE220737.007	SOIL - 11/6/2021 SE220737.015
Perfluorobutanoic acid (PFBA)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016
Perfluoropentanoic acid (PFPeA)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016
Perfluorohexanoic acid (PFHxA)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016
Perfluorooctanoic Acid (PFOA)	mg/kg	0.0008	<0.0008	<0.0008	<0.0008
Perfluorononanoic acid (PFNA)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016
Perfluorodecanoic acid (PFDA)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016
Perfluoroundecanoic acid (PFUnA)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016
Perfluorododecanoic acid (PFDoA)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016
Perfluorohexadecanoic acid (PFHxDA)	mg/kg	0.0032	<0.0032	<0.0032	<0.0032
Perfluorobutane sulfonate (PFBS)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016
Perfluoropentane sulfonate (PFPeS)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016
Perfluorohexane sulfonate (PFHxS)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016
Perfluoroheptane sulfonate (PFHpS)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016
Perfluorooctane sulfonate (PFOS)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016
Sum PFOS and PFHXS	mg/kg	0.0016	<0.0016	<0.0016	<0.0016
Perfluorononane sulfonate (PFNS)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016
Perfluorodecane sulfonate (PFDS)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016
Perfluorododecane sulfonate (PFDoS)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016
1H,1H,2H,2H-Perfluorohexane sulfonate (4:2) (4:2 FTS)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016
1H,1H,2H,2H-Perfluorooctane sulfonate (6:2) (6:2 FTS)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016
1H,1H,2H,2H-Perfluorodecane sulfonate (8:2) (8:2 FTS)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016
Perfluorooctane sulfonamide (PFOSA)	mg/kg	0.0016	<0.0016	<0.0016	<0.0016
N-Methylperfluorooctane sulfonamide (N-MeFOSA)	mg/kg	0.008	<0.008	<0.008	<0.008
N-Ethylperfluorooctane sulfonamide (N-EtFOSA)	mg/kg	0.008	<0.008	<0.008	<0.008
2-(N-Methylperfluorooctane sulfonamido)-ethanol	mg/kg	0.016	<0.016	<0.016	<0.016
2-(N-Ethylperfluorooctane sulfonamido)-ethanol	mg/kg	0.016	<0.016	<0.016	<0.016
N-Methylperfluorooctanesulfonamidoacetic acid	mg/kg	0.008	<0.008	<0.008	<0.008
N-Ethylperfluorooctanesulfonamidoacetic Acid	mg/kg	0.008	<0.008	<0.008	<0.008
Total of PFAS (n=30)	mg/kg	0.08	<0.08	<0.08	<0.08

Trace Metals (Dissolved) in Water by ICPMS [AN318] Tested: 18/6/2021

PARAMETER	UOM	LOR	MW4	MW5	MW6	MW7	MW8
			WATER	WATER	WATER	WATER	WATER
			- 11/6/2021 SE220737.008	- 11/6/2021 SE220737.009	- 11/6/2021 SE220737.010	- 11/6/2021 SE220737.011	- 11/6/2021 SE220737.012
Arsenic, As	µg/L	1	1	<1	<1	<1	<1
Cadmium, Cd	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Copper, Cu	µg/L	1	1	<1	1	<1	1
Chromium, Cr	µg/L	1	2	3	8	3	2
Nickel, Ni	µg/L	1	<1	<1	<1	<1	<1
Lead, Pb	µg/L	1	<1	<1	<1	<1	<1
Zinc, Zn	µg/L	5	12	17	<5	5	<5

PARAMETER	UOM	LOR	MW9	MW10
			WATER	WATER
			- 11/6/2021 SE220737.013	- 11/6/2021 SE220737.014
Arsenic, As	µg/L	1	<1	<1
Cadmium, Cd	µg/L	0.1	<0.1	<0.1
Copper, Cu	µg/L	1	<1	<1
Chromium, Cr	µg/L	1	3	3
Nickel, Ni	µg/L	1	<1	<1
Lead, Pb	µg/L	1	<1	<1
Zinc, Zn	µg/L	5	<5	220

Mercury (dissolved) in Water [AN311(Perth)/AN312] Tested: 17/6/2021

			MW4	MW5	MW6	MW7	MW8
			WATER	WATER	WATER	WATER	WATER
			-	-	-	-	-
			11/6/2021	11/6/2021	11/6/2021	11/6/2021	11/6/2021
PARAMETER	UOM	LOR	SE220737.008	SE220737.009	SE220737.010	SE220737.011	SE220737.012
Mercury	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

			MW9	MW10
			WATER	WATER
			-	-
			11/6/2021	11/6/2021
PARAMETER	UOM	LOR	SE220737.013	SE220737.014
Mercury	mg/L	0.0001	<0.0001	<0.0001

Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous Samples - Low Level [MA-1523] Tested: 23/6/2021

PARAMETER	UOM	LOR	MW4	MW5	MW6	MW7	MW8
			WATER	WATER	WATER	WATER	WATER
			11/6/2021 SE220737.008	11/6/2021 SE220737.009	11/6/2021 SE220737.010	11/6/2021 SE220737.011	11/6/2021 SE220737.012
Perfluorobutanoic acid (PFBA)	µg/L	0.0005	0.035	0.0066	<0.0005	0.0014	0.0005
Perfluoropentanoic acid (PFPeA)	µg/L	0.0005	0.014	0.0030	<0.0005	0.0025	<0.0005
Perfluorohexanoic acid (PFHxA)	µg/L	0.0005	0.016	0.0065	0.0005	0.0022	0.0007
Perfluoroheptanoic acid (PFHpA)	µg/L	0.0005	0.0081	0.0044	0.0006	0.0011	0.0005
Perfluorooctanoic Acid (PFOA)	µg/L	0.0005	0.016	0.012	<0.0005	0.0018	0.010
Perfluorononanoic acid (PFNA)	µg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluorodecanoic acid (PFDA)	µg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoroundecanoic acid (PFUnA)	µg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluorododecanoic acid (PFDoA)	µg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluorohexadecanoic acid (PFHxDA)	µg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorobutane sulfonate (PFBS)	µg/L	0.001	0.002	0.001	<0.001	0.003	0.001
Perfluoropentane sulfonate (PFPeS)	µg/L	0.001	0.002	<0.001	<0.001	0.001	<0.001
Perfluorohexane sulfonate (PFHxS)	µg/L	0.0002	0.068	0.027	<0.0002	0.021	0.026
Perfluoroheptane sulfonate (PFHpS)	µg/L	0.0002	0.0003	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonate (PFOS)	µg/L	0.0002	0.016	0.0071	<0.0002	0.0081	0.011
Sum of PFHxS and PFOS	µg/L	0.0002	0.084	0.034	<0.0002	0.029	0.037
Perfluorononane sulfonate (PFNS)	µg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorodecane sulfonate (PFDS)	µg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorododecane sulfonate (PFDoS)	µg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1H,1H,2H,2H-Perfluorohexane sulfonate (4:2) (4:2 FTS)	µg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1H,1H,2H,2H-Perfluorooctane sulfonate (6:2) (6:2 FTS)	µg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1H,1H,2H,2H-Perfluorodecane sulfonate (8:2) (8:2 FTS)	µg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorooctane sulfonamide (PFOSA)	µg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
N-Methylperfluorooctane sulfonamide (N-MeFOSA)	µg/L	0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
N-Ethylperfluorooctane sulfonamide (N-EtFOSA)	µg/L	0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
2-(N-Methylperfluorooctane sulfonamido)-ethanol	µg/L	0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
2-(N-Ethylperfluorooctane sulfonamido)-ethanol	µg/L	0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
N-Methylperfluorooctanesulfonamidoacetic acid	µg/L	0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
N-Ethylperfluorooctanesulfonamidoacetic Acid	µg/L	0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
Total PFAS (n=30)	µg/L	0.006	0.18	0.067	<0.0060	0.042	0.050

Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous Samples - Low Level [MA-1523] Tested: 23/6/2021

PARAMETER	UOM	LOR	MW9	MW10	QC2	QCC	QCD
			WATER	WATER	WATER	WATER	WATER
			11/6/2021 SE220737.013	11/6/2021 SE220737.014	11/6/2021 SE220737.016	11/6/2021 SE220737.017	11/6/2021 SE220737.018
Perfluorobutanoic acid (PFBA)	µg/L	0.0005	0.0006	0.0097	0.033	0.0011	0.0013
Perfluoropentanoic acid (PFPeA)	µg/L	0.0005	<0.0005	0.0026	0.013	0.0016	0.0016
Perfluorohexanoic acid (PFHxA)	µg/L	0.0005	<0.0005	0.0054	0.014	0.0010	0.0010
Perfluoroheptanoic acid (PFHpA)	µg/L	0.0005	<0.0005	0.0018	0.0086	0.0006	<0.0005
Perfluorooctanoic Acid (PFOA)	µg/L	0.0005	<0.0005	0.018	0.017	0.0005	0.0012
Perfluorononanoic acid (PFNA)	µg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluorodecanoic acid (PFDA)	µg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoroundecanoic acid (PFUnA)	µg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluorododecanoic acid (PFDoA)	µg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluorohexadecanoic acid (PFHxDA)	µg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorobutane sulfonate (PFBS)	µg/L	0.001	<0.001	0.001	0.002	<0.001	<0.001
Perfluoropentane sulfonate (PFPeS)	µg/L	0.001	<0.001	0.001	0.002	<0.001	<0.001
Perfluorohexane sulfonate (PFHxS)	µg/L	0.0002	0.0005	0.034	0.058	0.0017	0.0014
Perfluoroheptane sulfonate (PFHpS)	µg/L	0.0002	<0.0002	0.0008	0.0003	<0.0002	<0.0002
Perfluorooctane sulfonate (PFOS)	µg/L	0.0002	0.0007	0.026	0.020	0.0017	0.0018
Sum of PFHxS and PFOS	µg/L	0.0002	0.0012	0.061	0.079	0.0034	0.0033
Perfluorononane sulfonate (PFNS)	µg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorodecane sulfonate (PFDS)	µg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorododecane sulfonate (PFDoS)	µg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1H,1H,2H,2H-Perfluorohexane sulfonate (4:2) (4:2 FTS)	µg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1H,1H,2H,2H-Perfluorooctane sulfonate (6:2) (6:2 FTS)	µg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1H,1H,2H,2H-Perfluorodecane sulfonate (8:2) (8:2 FTS)	µg/L	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorooctane sulfonamide (PFOSA)	µg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
N-Methylperfluorooctane sulfonamide (N-MeFOSA)	µg/L	0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
N-Ethylperfluorooctane sulfonamide (N-EtFOSA)	µg/L	0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
2-(N-Methylperfluorooctane sulfonamido)-ethanol	µg/L	0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
2-(N-Ethylperfluorooctane sulfonamido)-ethanol	µg/L	0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
N-Methylperfluorooctanesulfonamidoacetic acid	µg/L	0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
N-Ethylperfluorooctanesulfonamidoacetic Acid	µg/L	0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
Total PFAS (n=30)	µg/L	0.006	<0.0060	0.10	0.17	0.0082	0.0083

METHOD

METHODOLOGY SUMMARY

- AN002** The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
- AN020** Unpreserved water sample is filtered through a 0.45µm membrane filter and acidified with nitric acid similar to APHA3030B.
- AN040/AN320** A portion of sample is digested with nitric acid to decompose organic matter and hydrochloric acid to complete the digestion of metals. The digest is then analysed by ICP OES with metals results reported on the dried sample basis. Based on USEPA method 200.8 and 6010C.
- AN040** A portion of sample is digested with Nitric acid to decompose organic matter and Hydrochloric acid to complete the digestion of metals and then filtered for analysis by ASS or ICP as per USEPA Method 200.8.
- AN311(Perth)/AN312** Mercury by Cold Vapour AAS in Waters: Mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500.
- AN312** Mercury by Cold Vapour AAS in Soils: After digestion with nitric acid, hydrogen peroxide and hydrochloric acid, mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500
- AN318** Determination of elements at trace level in waters by ICP-MS technique,, referenced to USEPA 6020B and USEPA 200.8 (5.4).
- AN403** Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the NEPM 1999 (2013), >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). F2 is reported directly and also corrected by subtracting Naphthalene (from VOC method AN433) where available.
- AN403** Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Recoverable Hydrocarbons - Silica (TRH-Si) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents .
- AN403** The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependent on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.
- AN420** (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
- AN420** SVOC Compounds: Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
- AN433** VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC's are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.
- MA-1523** This method covers the analysis of per- and polyfluoroalkyl substances (PFAS) in aqueous, solid and biosolid samples and solvent extracts, determined as the total of linear and branched isomers. After spiking with isotopically labelled quantification surrogates and clean-up via SPE cartridges sample extracts are analysed by liquid chromatography/mass spectrometry (LC-MS/MS). PFAS concentrations are determined by isotope dilution quantification.

FOOTNOTES

*	NATA accreditation does not cover the performance of this service.	-	Not analysed.	UOM	Unit of Measure.
**	Indicative data, theoretical holding time exceeded.	NVL	Not validated.	LOR	Limit of Reporting.
***	Indicates that both * and ** apply.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the "Total" LOR will be the sum of those two LORs.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.

Note that in terms of units of radioactivity:

- 1 Bq is equivalent to 27 pCi
- 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au/en-gb/environment-health-and-safety.

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STATEMENT OF QA/QC PERFORMANCE

SE220737 R0

CLIENT DETAILS

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Project JME20005-6
Order Number JME20005-6
Samples 18

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SGS Reference SE220737 R0
Date Received 16 Jun 2021
Date Reported 23 Jun 2021

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS' stated Data Quality Objectives (DQO). Comments arising from the comparison were made and are reported below.

The data relating to sampling was taken from the Chain of Custody document.

This QA/QC Statement must be read in conjunction with the referenced Analytical Report.

The Statement and the Analytical Report must not be reproduced except in full.

All Data Quality Objectives were met with the exception of the following:

Duplicate	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	13 items
	Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES	5 items
	TRH (Total Recoverable Hydrocarbons) in Soil	5 items

SAMPLE SUMMARY

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Porth)/AN312

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW4	SE220737.008	LB226913	11 Jun 2021	16 Jun 2021	09 Jul 2021	17 Jun 2021	09 Jul 2021	21 Jun 2021
MW5	SE220737.009	LB226913	11 Jun 2021	16 Jun 2021	09 Jul 2021	17 Jun 2021	09 Jul 2021	21 Jun 2021
MW6	SE220737.010	LB226913	11 Jun 2021	16 Jun 2021	09 Jul 2021	17 Jun 2021	09 Jul 2021	21 Jun 2021
MW7	SE220737.011	LB226913	11 Jun 2021	16 Jun 2021	09 Jul 2021	17 Jun 2021	09 Jul 2021	21 Jun 2021
MW8	SE220737.012	LB226913	11 Jun 2021	16 Jun 2021	09 Jul 2021	17 Jun 2021	09 Jul 2021	21 Jun 2021
MW9	SE220737.013	LB226913	11 Jun 2021	16 Jun 2021	09 Jul 2021	17 Jun 2021	09 Jul 2021	21 Jun 2021
MW10	SE220737.014	LB226913	11 Jun 2021	16 Jun 2021	09 Jul 2021	17 Jun 2021	09 Jul 2021	21 Jun 2021

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
HA1-3	SE220737.001	LB227223	11 Jun 2021	16 Jun 2021	09 Jul 2021	21 Jun 2021	09 Jul 2021	23 Jun 2021
HA2-3	SE220737.002	LB227223	11 Jun 2021	16 Jun 2021	09 Jul 2021	21 Jun 2021	09 Jul 2021	23 Jun 2021
QC1	SE220737.015	LB227223	11 Jun 2021	16 Jun 2021	09 Jul 2021	21 Jun 2021	09 Jul 2021	23 Jun 2021

Moisture Content

Method: ME-(AU)-[ENV]AN002

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
HA1-3	SE220737.001	LB227109	11 Jun 2021	16 Jun 2021	25 Jun 2021	21 Jun 2021	26 Jun 2021	22 Jun 2021
HA2-3	SE220737.002	LB227109	11 Jun 2021	16 Jun 2021	25 Jun 2021	21 Jun 2021	26 Jun 2021	22 Jun 2021
QC1	SE220737.015	LB227109	11 Jun 2021	16 Jun 2021	25 Jun 2021	21 Jun 2021	26 Jun 2021	22 Jun 2021

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
HA1-3	SE220737.001	LB226970	11 Jun 2021	16 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	22 Jun 2021
HA2-3	SE220737.002	LB226970	11 Jun 2021	16 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	22 Jun 2021
QC1	SE220737.015	LB226970	11 Jun 2021	16 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	22 Jun 2021

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
HA1-3	SE220737.001	LB226970	11 Jun 2021	16 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	22 Jun 2021
HA2-3	SE220737.002	LB226970	11 Jun 2021	16 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	22 Jun 2021
QC1	SE220737.015	LB226970	11 Jun 2021	16 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	22 Jun 2021

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
HA1-3	SE220737.001	LB226970	11 Jun 2021	16 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	22 Jun 2021
HA2-3	SE220737.002	LB226970	11 Jun 2021	16 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	22 Jun 2021
QC1	SE220737.015	LB226970	11 Jun 2021	16 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	22 Jun 2021

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
HA1-3	SE220737.001	LB227222	11 Jun 2021	16 Jun 2021	08 Dec 2021	21 Jun 2021	08 Dec 2021	23 Jun 2021
HA2-3	SE220737.002	LB227222	11 Jun 2021	16 Jun 2021	08 Dec 2021	21 Jun 2021	08 Dec 2021	23 Jun 2021
QC1	SE220737.015	LB227222	11 Jun 2021	16 Jun 2021	08 Dec 2021	21 Jun 2021	08 Dec 2021	23 Jun 2021

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW4	SE220737.008	LB227006	11 Jun 2021	16 Jun 2021	08 Dec 2021	18 Jun 2021	08 Dec 2021	21 Jun 2021
MW5	SE220737.009	LB227006	11 Jun 2021	16 Jun 2021	08 Dec 2021	18 Jun 2021	08 Dec 2021	21 Jun 2021
MW6	SE220737.010	LB227006	11 Jun 2021	16 Jun 2021	08 Dec 2021	18 Jun 2021	08 Dec 2021	21 Jun 2021
MW7	SE220737.011	LB227006	11 Jun 2021	16 Jun 2021	08 Dec 2021	18 Jun 2021	08 Dec 2021	21 Jun 2021
MW8	SE220737.012	LB227006	11 Jun 2021	16 Jun 2021	08 Dec 2021	18 Jun 2021	08 Dec 2021	21 Jun 2021
MW9	SE220737.013	LB227006	11 Jun 2021	16 Jun 2021	08 Dec 2021	18 Jun 2021	08 Dec 2021	21 Jun 2021
MW10	SE220737.014	LB227006	11 Jun 2021	16 Jun 2021	08 Dec 2021	18 Jun 2021	08 Dec 2021	21 Jun 2021

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
HA1-3	SE220737.001	LB226970	11 Jun 2021	16 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	22 Jun 2021
HA2-3	SE220737.002	LB226970	11 Jun 2021	16 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	22 Jun 2021
QC1	SE220737.015	LB226970	11 Jun 2021	16 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	22 Jun 2021

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
HA1-3	SE220737.001	LB226974	11 Jun 2021	16 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	22 Jun 2021
HA2-3	SE220737.002	LB226974	11 Jun 2021	16 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	22 Jun 2021

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the

VOC's in Soil (continued)

Method: ME-(AU)-ENVJAN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC1	SE220737.015	LB226974	11 Jun 2021	16 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	22 Jun 2021

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-ENVJAN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
HA1-3	SE220737.001	LB226974	11 Jun 2021	16 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	22 Jun 2021
HA2-3	SE220737.002	LB226974	11 Jun 2021	16 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	22 Jun 2021
QC1	SE220737.015	LB226974	11 Jun 2021	16 Jun 2021	25 Jun 2021	17 Jun 2021	27 Jul 2021	22 Jun 2021

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	HA2-3	SE220737.002	%	60 - 130%	101

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	HA1-3	SE220737.001	%	70 - 130%	90
	HA2-3	SE220737.002	%	70 - 130%	90
	QC1	SE220737.015	%	70 - 130%	96
d14-p-terphenyl (Surrogate)	HA1-3	SE220737.001	%	70 - 130%	94
	HA2-3	SE220737.002	%	70 - 130%	94
	QC1	SE220737.015	%	70 - 130%	94
d5-nitrobenzene (Surrogate)	HA1-3	SE220737.001	%	70 - 130%	98
	HA2-3	SE220737.002	%	70 - 130%	96
	QC1	SE220737.015	%	70 - 130%	100

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	HA2-3	SE220737.002	%	60 - 130%	101

Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous Samples - Low Level

Method: MA-1523

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
(13C2_PFTeDA) Isotopically Labelled Internal Recovery Standard	MW4	SE220737.008	%	10 - 150%	91
	MW5	SE220737.009	%	10 - 150%	65
	MW6	SE220737.010	%	10 - 150%	89
	MW7	SE220737.011	%	10 - 150%	91
	MW8	SE220737.012	%	10 - 150%	93
	MW9	SE220737.013	%	10 - 150%	108
	MW10	SE220737.014	%	10 - 150%	77
	QC2	SE220737.016	%	10 - 150%	101
	QCC	SE220737.017	%	10 - 150%	91
(13C2-4:2 FTS) Isotopically Labelled Internal Recovery Standard	QCD	SE220737.018	%	10 - 150%	86
	MW4	SE220737.008	%	10 - 150%	42
	MW5	SE220737.009	%	10 - 150%	44
	MW6	SE220737.010	%	10 - 150%	44
	MW7	SE220737.011	%	10 - 150%	54
	MW8	SE220737.012	%	10 - 150%	56
	MW9	SE220737.013	%	10 - 150%	42
	MW10	SE220737.014	%	10 - 150%	50
	QC2	SE220737.016	%	10 - 150%	40
(13C2-6:2 FTS) Isotopically Labelled Internal Recovery Standard	QCC	SE220737.017	%	10 - 150%	45
	QCD	SE220737.018	%	10 - 150%	49
	MW4	SE220737.008	%	10 - 150%	99
	MW5	SE220737.009	%	10 - 150%	91
	MW6	SE220737.010	%	10 - 150%	84
	MW7	SE220737.011	%	10 - 150%	120
	MW8	SE220737.012	%	10 - 150%	118
	MW9	SE220737.013	%	10 - 150%	83
	MW10	SE220737.014	%	10 - 150%	109
(13C2-8:2 FTS) Isotopically Labelled Internal Recovery Standard	QC2	SE220737.016	%	10 - 150%	98
	QCC	SE220737.017	%	10 - 150%	92
	QCD	SE220737.018	%	10 - 150%	95
	MW4	SE220737.008	%	10 - 150%	81
	MW5	SE220737.009	%	10 - 150%	84
	MW6	SE220737.010	%	10 - 150%	77
	MW7	SE220737.011	%	10 - 150%	89
	MW8	SE220737.012	%	10 - 150%	86
	MW9	SE220737.013	%	10 - 150%	70
	MW10	SE220737.014	%	10 - 150%	113
	QC2	SE220737.016	%	10 - 150%	89
	QCC	SE220737.017	%	10 - 150%	80
	QCD	SE220737.018	%	10 - 150%	84

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous Samples - Low Level (continued)

Method: MA-1523

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
(13C2-PFDoA) Isotopically Labelled Internal Recovery Standard	MW4	SE220737.008	%	10 - 150%	95
	MW5	SE220737.009	%	10 - 150%	81
	MW6	SE220737.010	%	10 - 150%	86
	MW7	SE220737.011	%	10 - 150%	90
	MW8	SE220737.012	%	10 - 150%	98
	MW9	SE220737.013	%	10 - 150%	101
	MW10	SE220737.014	%	10 - 150%	77
	QC2	SE220737.016	%	10 - 150%	87
	QCC	SE220737.017	%	10 - 150%	90
(13C2-PFHxDA) Isotopically Labelled Internal Recovery Standard	QCD	SE220737.018	%	10 - 150%	80
	MW4	SE220737.008	%	10 - 150%	125
	MW5	SE220737.009	%	10 - 150%	88
	MW6	SE220737.010	%	10 - 150%	110
	MW7	SE220737.011	%	10 - 150%	125
	MW8	SE220737.012	%	10 - 150%	121
	MW9	SE220737.013	%	10 - 150%	115
	MW10	SE220737.014	%	10 - 150%	120
	QC2	SE220737.016	%	10 - 150%	148
(13C3-PFBs) Isotopically Labelled Internal Recovery Standard	QCC	SE220737.017	%	10 - 150%	116
	QCD	SE220737.018	%	10 - 150%	111
	MW4	SE220737.008	%	10 - 150%	48
	MW5	SE220737.009	%	10 - 150%	57
	MW6	SE220737.010	%	10 - 150%	51
	MW7	SE220737.011	%	10 - 150%	54
	MW8	SE220737.012	%	10 - 150%	52
	MW9	SE220737.013	%	10 - 150%	47
	MW10	SE220737.014	%	10 - 150%	49
(13C3-PFHxS) Isotopically Labelled Internal Recovery Standard	QC2	SE220737.016	%	10 - 150%	44
	QCC	SE220737.017	%	10 - 150%	51
	QCD	SE220737.018	%	10 - 150%	58
	MW4	SE220737.008	%	10 - 150%	96
	MW5	SE220737.009	%	10 - 150%	90
	MW6	SE220737.010	%	10 - 150%	98
	MW7	SE220737.011	%	10 - 150%	99
	MW8	SE220737.012	%	10 - 150%	101
	MW9	SE220737.013	%	10 - 150%	90
(13C4_PFOA) Isotopically Labelled Internal Recovery Standard	MW10	SE220737.014	%	10 - 150%	95
	QC2	SE220737.016	%	10 - 150%	95
	QCC	SE220737.017	%	10 - 150%	113
	QCD	SE220737.018	%	10 - 150%	102
	MW4	SE220737.008	%	10 - 150%	106
	MW5	SE220737.009	%	10 - 150%	103
	MW6	SE220737.010	%	10 - 150%	106
	MW7	SE220737.011	%	10 - 150%	105
	MW8	SE220737.012	%	10 - 150%	97
(13C4-PFBA) Isotopically Labelled Internal Recovery Standard	MW9	SE220737.013	%	10 - 150%	93
	MW10	SE220737.014	%	10 - 150%	94
	QC2	SE220737.016	%	10 - 150%	107
	QCC	SE220737.017	%	10 - 150%	101
	QCD	SE220737.018	%	10 - 150%	103
	MW4	SE220737.008	%	10 - 150%	101
	MW5	SE220737.009	%	10 - 150%	100
	MW6	SE220737.010	%	10 - 150%	101
	MW7	SE220737.011	%	10 - 150%	99
(13C4-PFHpA) Isotopically Labelled Internal Recovery Standard	MW8	SE220737.012	%	10 - 150%	102
	MW9	SE220737.013	%	10 - 150%	100
	MW10	SE220737.014	%	10 - 150%	101
	QC2	SE220737.016	%	10 - 150%	100
	QCC	SE220737.017	%	10 - 150%	100
	QCD	SE220737.018	%	10 - 150%	100
	MW4	SE220737.008	%	10 - 150%	87

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous Samples - Low Level (continued)

Method: MA-1523

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
(13C4-PFHpA) Isotopically Labelled Internal Recovery Standard	MW5	SE220737.009	%	10 - 150%	95
	MW6	SE220737.010	%	10 - 150%	85
	MW7	SE220737.011	%	10 - 150%	90
	MW8	SE220737.012	%	10 - 150%	81
	MW9	SE220737.013	%	10 - 150%	82
	MW10	SE220737.014	%	10 - 150%	77
	QC2	SE220737.016	%	10 - 150%	80
	QCC	SE220737.017	%	10 - 150%	79
	QCD	SE220737.018	%	10 - 150%	92
(13C5-PFHxA) Isotopically Labelled Internal Recovery Standard	MW4	SE220737.008	%	10 - 150%	61
	MW5	SE220737.009	%	10 - 150%	65
	MW6	SE220737.010	%	10 - 150%	61
	MW7	SE220737.011	%	10 - 150%	60
	MW8	SE220737.012	%	10 - 150%	57
	MW9	SE220737.013	%	10 - 150%	58
	MW10	SE220737.014	%	10 - 150%	57
	QC2	SE220737.016	%	10 - 150%	57
	QCC	SE220737.017	%	10 - 150%	57
(13C5-PFPeA) Isotopically Labelled Internal Recovery Standard	MW4	SE220737.008	%	10 - 150%	86
	MW5	SE220737.009	%	10 - 150%	85
	MW6	SE220737.010	%	10 - 150%	77
	MW7	SE220737.011	%	10 - 150%	80
	MW8	SE220737.012	%	10 - 150%	74
	MW9	SE220737.013	%	10 - 150%	78
	MW10	SE220737.014	%	10 - 150%	79
	QC2	SE220737.016	%	10 - 150%	83
	QCC	SE220737.017	%	10 - 150%	77
(13C6-PFDa) Isotopically Labelled Internal Recovery Standard	MW4	SE220737.008	%	10 - 150%	101
	MW5	SE220737.009	%	10 - 150%	80
	MW6	SE220737.010	%	10 - 150%	104
	MW7	SE220737.011	%	10 - 150%	102
	MW8	SE220737.012	%	10 - 150%	111
	MW9	SE220737.013	%	10 - 150%	99
	MW10	SE220737.014	%	10 - 150%	91
	QC2	SE220737.016	%	10 - 150%	93
	QCC	SE220737.017	%	10 - 150%	98
(13C7-PFUDa) Isotopically Labelled Internal Recovery Standard	MW4	SE220737.008	%	10 - 150%	87
	MW5	SE220737.009	%	10 - 150%	91
	MW6	SE220737.010	%	10 - 150%	90
	MW7	SE220737.011	%	10 - 150%	92
	MW8	SE220737.012	%	10 - 150%	93
	MW9	SE220737.013	%	10 - 150%	91
	MW10	SE220737.014	%	10 - 150%	82
	QC2	SE220737.016	%	10 - 150%	90
	QCC	SE220737.017	%	10 - 150%	96
(13C8-PFOSA) Isotopically Labelled Internal Recovery Standard	MW4	SE220737.008	%	10 - 150%	95
	MW5	SE220737.009	%	10 - 150%	121
	MW6	SE220737.010	%	10 - 150%	95
	MW7	SE220737.011	%	10 - 150%	102
	MW8	SE220737.012	%	10 - 150%	94
	MW9	SE220737.013	%	10 - 150%	93
	MW10	SE220737.014	%	10 - 150%	98
	QC2	SE220737.016	%	10 - 150%	90
	QCC	SE220737.017	%	10 - 150%	108
(13C8-PFOSA) Isotopically Labelled Internal Recovery Standard	MW4	SE220737.008	%	10 - 150%	96
	MW5	SE220737.009	%	10 - 150%	72
	MW6	SE220737.010	%	10 - 150%	75
	MW7	SE220737.011	%	10 - 150%	75
	MW8	SE220737.012	%	10 - 150%	75
	MW9	SE220737.013	%	10 - 150%	75
	MW10	SE220737.014	%	10 - 150%	75
	QC2	SE220737.016	%	10 - 150%	75
	QCC	SE220737.017	%	10 - 150%	75

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous Samples - Low Level (continued)

Method: MA-1523

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
(13C8-PFOSA) Isotopically Labelled Internal Recovery Standard	MW6	SE220737.010	%	10 - 150%	60
	MW7	SE220737.011	%	10 - 150%	77
	MW8	SE220737.012	%	10 - 150%	61
	MW9	SE220737.013	%	10 - 150%	70
	MW10	SE220737.014	%	10 - 150%	64
	QC2	SE220737.016	%	10 - 150%	76
	QCC	SE220737.017	%	10 - 150%	69
(13C9-PFNA) Isotopically Labelled Internal Recovery Standard	QCD	SE220737.018	%	10 - 150%	62
	MW4	SE220737.008	%	10 - 150%	107
	MW5	SE220737.009	%	10 - 150%	108
	MW6	SE220737.010	%	10 - 150%	97
	MW7	SE220737.011	%	10 - 150%	86
	MW8	SE220737.012	%	10 - 150%	97
	MW9	SE220737.013	%	10 - 150%	94
(D3-N-MeFOSA) Isotopically Labelled Internal Recovery Standard	MW10	SE220737.014	%	10 - 150%	102
	QC2	SE220737.016	%	10 - 150%	101
	QCC	SE220737.017	%	10 - 150%	95
	QCD	SE220737.018	%	10 - 150%	92
	MW4	SE220737.008	%	10 - 150%	69
	MW5	SE220737.009	%	10 - 150%	62
	MW6	SE220737.010	%	10 - 150%	64
(D3-N-MeFOSAA) Isotopically Labelled Internal Recovery Standard	MW7	SE220737.011	%	10 - 150%	66
	MW8	SE220737.012	%	10 - 150%	53
	MW9	SE220737.013	%	10 - 150%	65
	MW10	SE220737.014	%	10 - 150%	51
	QC2	SE220737.016	%	10 - 150%	63
	QCC	SE220737.017	%	10 - 150%	63
	QCD	SE220737.018	%	10 - 150%	70
(D5-N-EtFOSA) Isotopically Labelled Internal Recovery Standard	MW4	SE220737.008	%	10 - 150%	72
	MW5	SE220737.009	%	10 - 150%	57
	MW6	SE220737.010	%	10 - 150%	63
	MW7	SE220737.011	%	10 - 150%	72
	MW8	SE220737.012	%	10 - 150%	58
	MW9	SE220737.013	%	10 - 150%	64
	MW10	SE220737.014	%	10 - 150%	70
(D5-N-EtFOSAA) Isotopically Labelled Internal Recovery Standard	QC2	SE220737.016	%	10 - 150%	66
	QCC	SE220737.017	%	10 - 150%	55
	QCD	SE220737.018	%	10 - 150%	61
	MW4	SE220737.008	%	10 - 150%	61
	MW5	SE220737.009	%	10 - 150%	55
	MW6	SE220737.010	%	10 - 150%	55
	MW7	SE220737.011	%	10 - 150%	66
(D7-N-MeFOSE) Isotopically Labelled Internal Recovery Standard	MW8	SE220737.012	%	10 - 150%	61
	MW9	SE220737.013	%	10 - 150%	67
	MW10	SE220737.014	%	10 - 150%	49
	QC2	SE220737.016	%	10 - 150%	61
	QCC	SE220737.017	%	10 - 150%	65
	QCD	SE220737.018	%	10 - 150%	63
	MW4	SE220737.008	%	10 - 150%	78
(D7-N-MeFOSE) Isotopically Labelled Internal Recovery Standard	MW5	SE220737.009	%	10 - 150%	47
	MW6	SE220737.010	%	10 - 150%	59
	MW7	SE220737.011	%	10 - 150%	73
	MW8	SE220737.012	%	10 - 150%	77
	MW9	SE220737.013	%	10 - 150%	55
	MW10	SE220737.014	%	10 - 150%	76
	QC2	SE220737.016	%	10 - 150%	75
(D7-N-MeFOSE) Isotopically Labelled Internal Recovery Standard	QCC	SE220737.017	%	10 - 150%	71
	QCD	SE220737.018	%	10 - 150%	59
	MW4	SE220737.008	%	10 - 150%	53
(D7-N-MeFOSE) Isotopically Labelled Internal Recovery Standard	MW5	SE220737.009	%	10 - 150%	57
	MW6	SE220737.010	%	10 - 150%	46

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous Samples - Low Level (continued)

Method: MA-1523

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
(D7-N-MeFOSE) Isotopically Labelled Internal Recovery Standard	MW7	SE220737.011	%	10 - 150%	58
	MW8	SE220737.012	%	10 - 150%	46
	MW9	SE220737.013	%	10 - 150%	60
	MW10	SE220737.014	%	10 - 150%	50
	QC2	SE220737.016	%	10 - 150%	54
	QCC	SE220737.017	%	10 - 150%	51
	QCD	SE220737.018	%	10 - 150%	49
(D9-N-EtFOSE) Isotopically Labelled Internal Recovery Standard	MW4	SE220737.008	%	10 - 150%	54
	MW5	SE220737.009	%	10 - 150%	62
	MW6	SE220737.010	%	10 - 150%	44
	MW7	SE220737.011	%	10 - 150%	54
	MW8	SE220737.012	%	10 - 150%	49
	MW9	SE220737.013	%	10 - 150%	56
	MW10	SE220737.014	%	10 - 150%	45
	QC2	SE220737.016	%	10 - 150%	50
	QCC	SE220737.017	%	10 - 150%	48
	QCD	SE220737.018	%	10 - 150%	51

Per- and Polyfluoroalkyl Substances (PFAS) in Solid Samples

Method: MA-1523

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
(13C2-PFTeDA) Isotopically Labelled Internal Recovery Standard	HA1-3	SE220737.001	%	0 - 130%	69
	HA2-3	SE220737.002	%	0 - 130%	84
	HA3-1	SE220737.003	%	0 - 130%	63
	HA3-2	SE220737.004	%	0 - 130%	55
	HA4-0	SE220737.005	%	0 - 130%	49
	HA4-1	SE220737.006	%	0 - 130%	55
	HA4-2	SE220737.007	%	0 - 130%	49
	QC1	SE220737.015	%	0 - 130%	38
(13C2-4:2 FTS) Isotopically Labelled Internal Recovery Standard	HA1-3	SE220737.001	%	0 - 150%	87
	HA2-3	SE220737.002	%	0 - 150%	79
	HA3-1	SE220737.003	%	0 - 150%	79
	HA3-2	SE220737.004	%	0 - 150%	87
	HA4-0	SE220737.005	%	0 - 150%	82
	HA4-1	SE220737.006	%	0 - 150%	86
	HA4-2	SE220737.007	%	0 - 150%	81
	QC1	SE220737.015	%	0 - 150%	91
(13C2-6:2 FTS) Isotopically Labelled Internal Recovery Standard	HA1-3	SE220737.001	%	0 - 150%	90
	HA2-3	SE220737.002	%	0 - 150%	79
	HA3-1	SE220737.003	%	0 - 150%	82
	HA3-2	SE220737.004	%	0 - 150%	83
	HA4-0	SE220737.005	%	0 - 150%	85
	HA4-1	SE220737.006	%	0 - 150%	81
	HA4-2	SE220737.007	%	0 - 150%	79
	QC1	SE220737.015	%	0 - 150%	90
(13C2-8:2 FTS) Isotopically Labelled Internal Recovery Standard	HA1-3	SE220737.001	%	0 - 150%	98
	HA2-3	SE220737.002	%	0 - 150%	81
	HA3-1	SE220737.003	%	0 - 150%	70
	HA3-2	SE220737.004	%	0 - 150%	74
	HA4-0	SE220737.005	%	0 - 150%	74
	HA4-1	SE220737.006	%	0 - 150%	72
	HA4-2	SE220737.007	%	0 - 150%	69
	QC1	SE220737.015	%	0 - 150%	78
(13C2-PFDoA) Isotopically Labelled Internal Recovery Standard	HA1-3	SE220737.001	%	0 - 150%	107
	HA2-3	SE220737.002	%	0 - 150%	101
	HA3-1	SE220737.003	%	0 - 150%	80
	HA3-2	SE220737.004	%	0 - 150%	87
	HA4-0	SE220737.005	%	0 - 150%	85
	HA4-1	SE220737.006	%	0 - 150%	85
	HA4-2	SE220737.007	%	0 - 150%	90
	QC1	SE220737.015	%	0 - 150%	79
(13C2-PFHxDA) Isotopically Labelled Internal Recovery Standard	HA1-3	SE220737.001	%	0 - 150%	36

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Per- and Polyfluoroalkyl Substances (PFAS) in Solid Samples (continued)

Method: MA-1523

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
(13C2-PFHxDA) Isotopically Labelled Internal Recovery Standard	HA2-3	SE220737.002	%	0 - 150%	38
	HA3-1	SE220737.003	%	0 - 150%	33
	HA3-2	SE220737.004	%	0 - 150%	38
	HA4-0	SE220737.005	%	0 - 150%	27
	HA4-1	SE220737.006	%	0 - 150%	24
	HA4-2	SE220737.007	%	0 - 150%	22
	QC1	SE220737.015	%	0 - 150%	15
(13C3-PFBS) Isotopically Labelled Internal Recovery Standard	HA1-3	SE220737.001	%	0 - 150%	83
	HA2-3	SE220737.002	%	0 - 150%	77
	HA3-1	SE220737.003	%	0 - 150%	83
	HA3-2	SE220737.004	%	0 - 150%	89
	HA4-0	SE220737.005	%	0 - 150%	90
	HA4-1	SE220737.006	%	0 - 150%	84
	HA4-2	SE220737.007	%	0 - 150%	82
(13C3-PFHxS) Isotopically Labelled Internal Recovery Standard	QC1	SE220737.015	%	0 - 150%	91
	HA1-3	SE220737.001	%	0 - 150%	101
	HA2-3	SE220737.002	%	0 - 150%	102
	HA3-1	SE220737.003	%	0 - 150%	99
	HA3-2	SE220737.004	%	0 - 150%	88
	HA4-0	SE220737.005	%	0 - 150%	105
	HA4-1	SE220737.006	%	0 - 150%	91
(13C4_PFOA) Isotopically Labelled Internal Recovery Standard	HA4-2	SE220737.007	%	0 - 150%	104
	QC1	SE220737.015	%	0 - 150%	104
	HA1-3	SE220737.001	%	0 - 150%	95
	HA2-3	SE220737.002	%	0 - 150%	103
	HA3-1	SE220737.003	%	0 - 150%	101
	HA3-2	SE220737.004	%	0 - 150%	106
	HA4-0	SE220737.005	%	0 - 150%	99
(13C4-PFBA) Isotopically Labelled Internal Recovery Standard	HA4-1	SE220737.006	%	0 - 150%	103
	HA4-2	SE220737.007	%	0 - 150%	102
	QC1	SE220737.015	%	0 - 150%	104
	HA1-3	SE220737.001	%	0 - 150%	100
	HA2-3	SE220737.002	%	0 - 150%	102
	HA3-1	SE220737.003	%	0 - 150%	101
	HA3-2	SE220737.004	%	0 - 150%	101
(13C4-PFHpA) Isotopically Labelled Internal Recovery Standard	HA4-0	SE220737.005	%	0 - 150%	100
	HA4-1	SE220737.006	%	0 - 150%	101
	HA4-2	SE220737.007	%	0 - 150%	99
	QC1	SE220737.015	%	0 - 150%	103
	HA1-3	SE220737.001	%	0 - 150%	93
	HA2-3	SE220737.002	%	0 - 150%	96
	HA3-1	SE220737.003	%	0 - 150%	98
(13C5-PFHxA) Isotopically Labelled Internal Recovery Standard	HA3-2	SE220737.004	%	0 - 150%	106
	HA4-0	SE220737.005	%	0 - 150%	96
	HA4-1	SE220737.006	%	0 - 150%	100
	HA4-2	SE220737.007	%	0 - 150%	96
	QC1	SE220737.015	%	0 - 150%	102
	HA1-3	SE220737.001	%	0 - 150%	90
	HA2-3	SE220737.002	%	0 - 150%	92
(13C5-PFPeA) Isotopically Labelled Internal Recovery Standard	HA3-1	SE220737.003	%	0 - 150%	95
	HA3-2	SE220737.004	%	0 - 150%	104
	HA4-0	SE220737.005	%	0 - 150%	92
	HA4-1	SE220737.006	%	0 - 150%	103
	HA4-2	SE220737.007	%	0 - 150%	96
	QC1	SE220737.015	%	0 - 150%	102
	HA1-3	SE220737.001	%	0 - 150%	102
(13C5-PFPeA) Isotopically Labelled Internal Recovery Standard	HA2-3	SE220737.002	%	0 - 150%	105
	HA3-1	SE220737.003	%	0 - 150%	101
	HA3-2	SE220737.004	%	0 - 150%	102
	HA4-0	SE220737.005	%	0 - 150%	108
	HA4-1	SE220737.006	%	0 - 150%	105

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Per- and Polyfluoroalkyl Substances (PFAS) in Solid Samples (continued)

Method: MA-1523

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
(13C5-PFPeA) Isotopically Labelled Internal Recovery Standard	HA4-2	SE220737.007	%	0 - 150%	104
	QC1	SE220737.015	%	0 - 150%	105
(13C6-PFDA) Isotopically Labelled Internal Recovery Standard	HA1-3	SE220737.001	%	0 - 150%	112
	HA2-3	SE220737.002	%	0 - 150%	93
	HA3-1	SE220737.003	%	0 - 150%	104
	HA3-2	SE220737.004	%	0 - 150%	108
	HA4-0	SE220737.005	%	0 - 150%	111
	HA4-1	SE220737.006	%	0 - 150%	82
	HA4-2	SE220737.007	%	0 - 150%	110
	QC1	SE220737.015	%	0 - 150%	98
(13C7-PFUDA) Isotopically Labelled Internal Recovery Standard	HA1-3	SE220737.001	%	0 - 150%	112
	HA2-3	SE220737.002	%	0 - 150%	114
	HA3-1	SE220737.003	%	0 - 150%	99
	HA3-2	SE220737.004	%	0 - 150%	105
	HA4-0	SE220737.005	%	0 - 150%	111
	HA4-1	SE220737.006	%	0 - 150%	97
	HA4-2	SE220737.007	%	0 - 150%	115
	QC1	SE220737.015	%	0 - 150%	95
(13C8-PFOS) Isotopically Labelled Internal Recovery Standard	HA1-3	SE220737.001	%	0 - 150%	105
	HA2-3	SE220737.002	%	0 - 150%	96
	HA3-1	SE220737.003	%	0 - 150%	99
	HA3-2	SE220737.004	%	0 - 150%	87
	HA4-0	SE220737.005	%	0 - 150%	101
	HA4-1	SE220737.006	%	0 - 150%	94
	HA4-2	SE220737.007	%	0 - 150%	101
	QC1	SE220737.015	%	0 - 150%	108
(13C8-PFOSA) Isotopically Labelled Internal Recovery Standard	HA1-3	SE220737.001	%	0 - 150%	52
	HA2-3	SE220737.002	%	0 - 150%	44
	HA3-1	SE220737.003	%	0 - 150%	71
	HA3-2	SE220737.004	%	0 - 150%	53
	HA4-0	SE220737.005	%	0 - 150%	66
	HA4-1	SE220737.006	%	0 - 150%	60
	HA4-2	SE220737.007	%	0 - 150%	60
	QC1	SE220737.015	%	0 - 150%	50
(13C9-PFNA) Isotopically Labelled Internal Recovery Standard	HA1-3	SE220737.001	%	0 - 150%	101
	HA2-3	SE220737.002	%	0 - 150%	102
	HA3-1	SE220737.003	%	0 - 150%	94
	HA3-2	SE220737.004	%	0 - 150%	93
	HA4-0	SE220737.005	%	0 - 150%	105
	HA4-1	SE220737.006	%	0 - 150%	97
	HA4-2	SE220737.007	%	0 - 150%	100
	QC1	SE220737.015	%	0 - 150%	95
(D3-N-MeFOSA) Isotopically Labelled Internal Recovery Standard	HA1-3	SE220737.001	%	0 - 150%	45
	HA2-3	SE220737.002	%	0 - 150%	39
	HA3-1	SE220737.003	%	0 - 150%	53
	HA3-2	SE220737.004	%	0 - 150%	49
	HA4-0	SE220737.005	%	0 - 150%	59
	HA4-1	SE220737.006	%	0 - 150%	50
	HA4-2	SE220737.007	%	0 - 150%	47
	QC1	SE220737.015	%	0 - 150%	45
(D3-N-MeFOSAA) Isotopically Labelled Internal Recovery Standard	HA1-3	SE220737.001	%	0 - 150%	57
	HA2-3	SE220737.002	%	0 - 150%	57
	HA3-1	SE220737.003	%	0 - 150%	64
	HA3-2	SE220737.004	%	0 - 150%	59
	HA4-0	SE220737.005	%	0 - 150%	61
	HA4-1	SE220737.006	%	0 - 150%	69
	HA4-2	SE220737.007	%	0 - 150%	56
	QC1	SE220737.015	%	0 - 150%	56
(D5-N-EtFOSA) Isotopically Labelled Internal Recovery Standard	HA1-3	SE220737.001	%	0 - 150%	34
	HA2-3	SE220737.002	%	0 - 150%	31
	HA3-1	SE220737.003	%	0 - 150%	50

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Per- and Polyfluoroalkyl Substances (PFAS) in Solid Samples (continued)

Method: MA-1523

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
(D5-N-EtFOSA) Isotopically Labelled Internal Recovery Standard	HA3-2	SE220737.004	%	0 - 150%	45
	HA4-0	SE220737.005	%	0 - 150%	52
	HA4-1	SE220737.006	%	0 - 150%	44
	HA4-2	SE220737.007	%	0 - 150%	38
	QC1	SE220737.015	%	0 - 150%	39
(D5-N-EtFOSAA) Isotopically Labelled Internal Recovery Standard	HA1-3	SE220737.001	%	0 - 150%	56
	HA2-3	SE220737.002	%	0 - 150%	50
	HA3-1	SE220737.003	%	0 - 150%	54
	HA3-2	SE220737.004	%	0 - 150%	55
	HA4-0	SE220737.005	%	0 - 150%	57
	HA4-1	SE220737.006	%	0 - 150%	62
	HA4-2	SE220737.007	%	0 - 150%	59
(D7-N-MeFOSE) Isotopically Labelled Internal Recovery Standard	QC1	SE220737.015	%	0 - 150%	57
	HA1-3	SE220737.001	%	0 - 150%	42
	HA2-3	SE220737.002	%	0 - 150%	36
	HA3-1	SE220737.003	%	0 - 150%	56
	HA3-2	SE220737.004	%	0 - 150%	45
	HA4-0	SE220737.005	%	0 - 150%	58
	HA4-1	SE220737.006	%	0 - 150%	56
(D9-N-EtFOSE) Isotopically Labelled Internal Recovery Standard	HA4-2	SE220737.007	%	0 - 150%	51
	QC1	SE220737.015	%	0 - 150%	42
	HA1-3	SE220737.001	%	0 - 150%	40
	HA2-3	SE220737.002	%	0 - 150%	35
	HA3-1	SE220737.003	%	0 - 150%	54
	HA3-2	SE220737.004	%	0 - 150%	47
	HA4-0	SE220737.005	%	0 - 150%	58
(D9-N-EtFOSE) Isotopically Labelled Internal Recovery Standard	HA4-1	SE220737.006	%	0 - 150%	51
	HA4-2	SE220737.007	%	0 - 150%	47
	QC1	SE220737.015	%	0 - 150%	43

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	HA1-3	SE220737.001	%	60 - 130%	81
	HA2-3	SE220737.002	%	60 - 130%	92
	QC1	SE220737.015	%	60 - 130%	80
d4-1,2-dichloroethane (Surrogate)	HA1-3	SE220737.001	%	60 - 130%	85
	HA2-3	SE220737.002	%	60 - 130%	89
	QC1	SE220737.015	%	60 - 130%	91
d8-toluene (Surrogate)	HA1-3	SE220737.001	%	60 - 130%	65
	HA2-3	SE220737.002	%	60 - 130%	73
	QC1	SE220737.015	%	60 - 130%	71

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	HA1-3	SE220737.001	%	60 - 130%	81
	HA2-3	SE220737.002	%	60 - 130%	92
	QC1	SE220737.015	%	60 - 130%	80
d4-1,2-dichloroethane (Surrogate)	HA1-3	SE220737.001	%	60 - 130%	85
	HA2-3	SE220737.002	%	60 - 130%	89
	QC1	SE220737.015	%	60 - 130%	91
d8-toluene (Surrogate)	HA1-3	SE220737.001	%	60 - 130%	65
	HA2-3	SE220737.002	%	60 - 130%	73
	QC1	SE220737.015	%	60 - 130%	71

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Porth)/AN312

Sample Number	Parameter	Units	LOR	Result
LB226913.001	Mercury	mg/L	0.0001	<0.0001

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Number	Parameter	Units	LOR	Result
LB227223.001	Mercury	mg/kg	0.05	<0.05

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result
LB226970.001	Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1
	Alpha BHC	mg/kg	0.1	<0.1
	Lindane	mg/kg	0.1	<0.1
	Heptachlor	mg/kg	0.1	<0.1
	Aldrin	mg/kg	0.1	<0.1
	Beta BHC	mg/kg	0.1	<0.1
	Delta BHC	mg/kg	0.1	<0.1
	Heptachlor epoxide	mg/kg	0.1	<0.1
	Alpha Endosulfan	mg/kg	0.2	<0.2
	Gamma Chlordane	mg/kg	0.1	<0.1
	Alpha Chlordane	mg/kg	0.1	<0.1
	p,p'-DDE	mg/kg	0.1	<0.1
	Dieldrin	mg/kg	0.2	<0.2
	Endrin	mg/kg	0.2	<0.2
	Beta Endosulfan	mg/kg	0.2	<0.2
	p,p'-DDD	mg/kg	0.1	<0.1
	p,p'-DDT	mg/kg	0.1	<0.1
	Endosulfan sulphate	mg/kg	0.1	<0.1
	Endrin Aldehyde	mg/kg	0.1	<0.1
	Methoxychlor	mg/kg	0.1	<0.1
	Endrin Ketone	mg/kg	0.1	<0.1
	Isodrin	mg/kg	0.1	<0.1
	Mirex	mg/kg	0.1	<0.1
Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	93

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result
LB226970.001	Naphthalene	mg/kg	0.1	<0.1
	2-methylnaphthalene	mg/kg	0.1	<0.1
	1-methylnaphthalene	mg/kg	0.1	<0.1
	Acenaphthylene	mg/kg	0.1	<0.1
	Acenaphthene	mg/kg	0.1	<0.1
	Fluorene	mg/kg	0.1	<0.1
	Phenanthrene	mg/kg	0.1	<0.1
	Anthracene	mg/kg	0.1	<0.1
	Fluoranthene	mg/kg	0.1	<0.1
	Pyrene	mg/kg	0.1	<0.1
	Benzo(a)anthracene	mg/kg	0.1	<0.1
	Chrysene	mg/kg	0.1	<0.1
	Benzo(a)pyrene	mg/kg	0.1	<0.1
	Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
	Dibenzo(ah)anthracene	mg/kg	0.1	<0.1
	Benzo(ghi)perylene	mg/kg	0.1	<0.1
	Total PAH (18)	mg/kg	0.8	<0.8
Surrogates	d5-nitrobenzene (Surrogate)	%	-	92
	2-fluorobiphenyl (Surrogate)	%	-	86
	d14-p-terphenyl (Surrogate)	%	-	88

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR
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Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

PCBs in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result
LB226970.001	Arochlor 1016	mg/kg	0.2	<0.2
	Arochlor 1221	mg/kg	0.2	<0.2
	Arochlor 1232	mg/kg	0.2	<0.2
	Arochlor 1242	mg/kg	0.2	<0.2
	Arochlor 1248	mg/kg	0.2	<0.2
	Arochlor 1254	mg/kg	0.2	<0.2
	Arochlor 1260	mg/kg	0.2	<0.2
	Arochlor 1262	mg/kg	0.2	<0.2
	Arochlor 1268	mg/kg	0.2	<0.2
	Total PCBs (Arochlors)	mg/kg	1	<1
Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	93

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number	Parameter	Units	LOR	Result
LB227222.001	Arsenic, As	mg/kg	1	<1
	Cadmium, Cd	mg/kg	0.3	<0.3
	Chromium, Cr	mg/kg	0.5	<0.5
	Copper, Cu	mg/kg	0.5	<0.5
	Nickel, Ni	mg/kg	0.5	<0.5
	Lead, Pb	mg/kg	1	<1
	Zinc, Zn	mg/kg	2	<2.0

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR	Result
LB227006.001	Arsenic, As	µg/L	1	<1
	Cadmium, Cd	µg/L	0.1	<0.1
	Chromium, Cr	µg/L	1	<1
	Copper, Cu	µg/L	1	<1
	Lead, Pb	µg/L	1	<1
	Nickel, Ni	µg/L	1	<1
	Zinc, Zn	µg/L	5	<5
LB227006.025	Arsenic, As	µg/L	1	<1
	Cadmium, Cd	µg/L	0.1	<0.1
	Chromium, Cr	µg/L	1	<1
	Copper, Cu	µg/L	1	<1
	Lead, Pb	µg/L	1	<1
	Nickel, Ni	µg/L	1	<1
	Zinc, Zn	µg/L	5	<5

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR	Result
LB226970.001	TRH C10-C14	mg/kg	20	<20
	TRH C15-C28	mg/kg	45	<45
	TRH C29-C36	mg/kg	45	<45
	TRH C37-C40	mg/kg	100	<100
	TRH C10-C36 Total	mg/kg	110	<110

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB226974.001	Monocyclic Aromatic Hydrocarbons	Benzene	mg/kg	0.1	<0.1
		Toluene	mg/kg	0.1	<0.1
		Ethylbenzene	mg/kg	0.1	<0.1
		m/p-xylene	mg/kg	0.2	<0.2
		o-xylene	mg/kg	0.1	<0.1
	Polycyclic VOCs	Naphthalene	mg/kg	0.1	<0.1
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	89
		d8-toluene (Surrogate)	%	-	76
		Bromofluorobenzene (Surrogate)	%	-	93
	Totals	Total BTEX	mg/kg	0.6	<0.6

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number	Parameter	Units	LOR
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Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Volatile Petroleum Hydrocarbons in Soil (continued)

Method: ME-(AU)-ENVJAN433

Sample Number	Parameter	Units	LOR	Result
LB226974.001	TRH C6-C9	mg/kg	20	<20
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	89

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: $RPD = | \text{OriginalResult} - \text{ReplicateResult} | \times 100 / \text{Mean}$

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: $MAD = 100 \times \text{SDL} / \text{Mean} + \text{LR}$

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Porth)/AN312

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE220737.008	LB226913.014	Mercury	µg/L	0.0001	<0.0001	<0.0001	196	2
SE220758.007	LB226913.024	Mercury	µg/L	0.0001	<0.0001	<0.0001	200	199

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE220738.001	LB227223.014	Mercury	mg/kg	0.05	<0.05	<0.05	200	0
SE220738.009	LB227223.023	Mercury	mg/kg	0.05	<0.05	<0.05	200	0

Moisture Content

Method: ME-(AU)-[ENV]AN002

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE220780.030	LB227109.011	% Moisture	%w/w	1	<1	<1	200	0
SE220780.033	LB227109.015	% Moisture	%w/w	1	20.3	19.3	35	5

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE220749.001	LB226970.014	Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	200	0
		Alpha BHC	mg/kg	0.1	<0.1	<0.1	200	0
		Lindane	mg/kg	0.1	<0.1	<0.1	200	0
		Heptachlor	mg/kg	0.1	<0.1	<0.1	200	0
		Aldrin	mg/kg	0.1	<0.1	<0.1	200	0
		Beta BHC	mg/kg	0.1	<0.1	<0.1	200	0
		Delta BHC	mg/kg	0.1	<0.1	<0.1	200	0
		Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	200	0
		o,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
		Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
		Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
		Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
		trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	200	0
		p,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
		Dieldrin	mg/kg	0.2	<0.2	<0.2	200	0
		Endrin	mg/kg	0.2	<0.2	<0.2	200	0
		o,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
		o,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
		Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
		p,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
		p,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
		Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	200	0
		Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	200	0
		Methoxychlor	mg/kg	0.1	<0.1	<0.1	200	0
		Endrin Ketone	mg/kg	0.1	<0.1	<0.1	200	0
		Isodrin	mg/kg	0.1	<0.1	<0.1	200	0
Mirex	mg/kg	0.1	<0.1	<0.1	200	0		
		Total CLP OC Pesticides	mg/kg	1	<1	<1	200	0
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.16	0.15	30	5

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE220749.001	LB226970.014	Naphthalene	mg/kg	0.1	<0.1	0.2	121	40
		2-methylnaphthalene	mg/kg	0.1	<0.1	0.1	200	10
		1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Acenaphthylene	mg/kg	0.1	0.1	0.2	110	40
		Acenaphthene	mg/kg	0.1	<0.1	<0.1	200	0
		Fluorene	mg/kg	0.1	<0.1	<0.1	200	0
		Phenanthrene	mg/kg	0.1	0.5	0.8	45	50 @
		Anthracene	mg/kg	0.1	0.2	0.3	74	40
		Fluoranthene	mg/kg	0.1	1.0	1.6	38	45 @
		Pyrene	mg/kg	0.1	1.1	1.7	37	44 @
		Benzo(a)anthracene	mg/kg	0.1	0.6	0.9	43	45 @
		Chrysene	mg/kg	0.1	0.5	0.9	44	54 @

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: $RPD = | \text{OriginalResult} - \text{ReplicateResult} | \times 100 / \text{Mean}$

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: $MAD = 100 \times \text{SDL} / \text{Mean} + \text{LR}$

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE220749.001	LB226970.014	Benzo(b&j)fluoranthene	mg/kg	0.1	0.9	1.6	38	58 @
		Benzo(k)fluoranthene	mg/kg	0.1	0.5	0.7	48	36
		Benzo(a)pyrene	mg/kg	0.1	0.9	1.5	39	49 @
		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	0.6	1.0	43	54 @
		Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
		Benzo(ghi)perylene	mg/kg	0.1	0.6	1.0	43	54 @
		Carcinogenic PAHs, BaP TEQ <LOR=0	mg/kg	0.2	1.1	1.9	23	49 @
		Carcinogenic PAHs, BaP TEQ <LOR=LOR	mg/kg	0.3	1.2	2.0	29	46 @
		Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	mg/kg	0.2	1.2	1.9	23	48 @
		Total PAH (18)	mg/kg	0.8	7.3	12	38	51 @
		Surrogates						
		d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	30	2
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	2
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.4	30	5

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE220749.001	LB226970.014	Arochlor 1016	mg/kg	0.2	<0.2	<0.2	200	0
		Arochlor 1221	mg/kg	0.2	<0.2	<0.2	200	0
		Arochlor 1232	mg/kg	0.2	<0.2	<0.2	200	0
		Arochlor 1242	mg/kg	0.2	<0.2	<0.2	200	0
		Arochlor 1248	mg/kg	0.2	<0.2	<0.2	200	0
		Arochlor 1254	mg/kg	0.2	<0.2	<0.2	200	0
		Arochlor 1260	mg/kg	0.2	<0.2	<0.2	200	0
		Arochlor 1262	mg/kg	0.2	<0.2	<0.2	200	0
		Arochlor 1268	mg/kg	0.2	<0.2	<0.2	200	0
		Total PCBs (Arochlors)	mg/kg	1	<1	<1	200	0
		Surrogates						
		Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0	0	30	5

Total Recoverable Elements in Soil/Waste Solids/Materials by ICP/OES

Method: ME-(AU)-[ENV]AN040/AN320

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE220738.001	LB227222.014	Arsenic, As	mg/kg	1	8	7	44	6
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.5	11	11	35	7
		Copper, Cu	mg/kg	0.5	68	80	31	16
		Nickel, Ni	mg/kg	0.5	2.5	5.5	43	76 @
		Lead, Pb	mg/kg	1	22	26	34	15
		Zinc, Zn	mg/kg	2	29	32	37	9
SE220738.009	LB227222.023	Arsenic, As	mg/kg	1	7	7	44	12
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.5	9.8	11	35	15
		Copper, Cu	mg/kg	0.5	59	130	31	74 @
		Nickel, Ni	mg/kg	0.5	1.8	5.9	43	108 @
		Lead, Pb	mg/kg	1	25	40	33	48 @
		Zinc, Zn	mg/kg	2	25	56	35	75 @

Trace Metals (Dissolved) in Water by ICP/MS

Method: ME-(AU)-[ENV]AN318

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE220737.013	LB227006.014	Arsenic, As	µg/L	1	<1	<1	156	0
		Cadmium, Cd	µg/L	0.1	<0.1	<0.1	200	0
		Chromium, Cr	µg/L	1	3	3	51	1
		Copper, Cu	µg/L	1	<1	<1	200	0
		Lead, Pb	µg/L	1	<1	<1	200	0
		Nickel, Ni	µg/L	1	<1	<1	200	0
		Zinc, Zn	µg/L	5	<5	<5	200	0
SE220758.007	LB227006.027	Arsenic, As	µg/L	1	<1	<1	200	0
		Cadmium, Cd	µg/L	0.1	<0.1	<0.1	200	0
		Chromium, Cr	µg/L	1	<1	<1	200	0
		Copper, Cu	µg/L	1	<1	<1	200	0
		Lead, Pb	µg/L	1	<1	<1	200	0
		Nickel, Ni	µg/L	1	1	1	93	11
		Zinc, Zn	µg/L	5	6	5	109	8

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: $RPD = | \text{OriginalResult} - \text{ReplicateResult} | \times 100 / \text{Mean}$

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: $MAD = 100 \times \text{SDL} / \text{Mean} + \text{LR}$

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE220749.001	LB226970.014	TRH C10-C14	mg/kg	20	<20	<20	200	0
		TRH C15-C28	mg/kg	45	87	270	55	103 @
		TRH C29-C36	mg/kg	45	110	350	50	103 @
		TRH C37-C40	mg/kg	100	<100	<100	200	0
		TRH C10-C36 Total	mg/kg	110	200	620	57	103 @
		TRH >C10-C40 Total (F bands)	mg/kg	210	<210	680	79	105 @
		TRH F Bands						
		TRH >C10-C16	mg/kg	25	<25	<25	200	0
		TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	200	0
		TRH >C16-C34 (F3)	mg/kg	90	180	540	55	100 @
		TRH >C34-C40 (F4)	mg/kg	120	<120	140	200	15

VOC's in Soil

Method: ME-(AU)-[ENV]AN403

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE220780.027	LB226974.017	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
			Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	171	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.2	9.0	50	10
			d8-toluene (Surrogate)	mg/kg	-	7.7	7.1	50	8
			Bromofluorobenzene (Surrogate)	mg/kg	-	8.0	8.0	50	0
		Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	200	0
	Total BTEX	ma/kq	0.6	<0.6	<0.6	200	0		

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN403

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE220780.027	LB226974.017	TRH C6-C10	mg/kg	25	<25	<25	200	0
		TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates						
		d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.2	9.0	30	10
		d8-toluene (Surrogate)	mg/kg	-	7.7	7.1	30	8
		Bromofluorobenzene (Surrogate)	mg/kg	-	8.0	8.0	30	0
		VPF F Bands						
		Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
		TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB227223.002	Mercury	mg/kg	0.05	0.19	0.2	70 - 130	97

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB226970.002	Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	112
	Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	93
	Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	96
	Dieldrin	mg/kg	0.2	<0.2	0.2	60 - 140	94
	Endrin	mg/kg	0.2	0.2	0.2	60 - 140	111
	p,p'-DDT	mg/kg	0.1	0.2	0.2	60 - 140	113
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.14	0.15	40 - 130

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %	
LB226970.002	Naphthalene	mg/kg	0.1	3.3	4	60 - 140	82	
	Acenaphthylene	mg/kg	0.1	3.4	4	60 - 140	86	
	Acenaphthene	mg/kg	0.1	3.3	4	60 - 140	83	
	Phenanthrene	mg/kg	0.1	3.3	4	60 - 140	82	
	Anthracene	mg/kg	0.1	3.3	4	60 - 140	83	
	Fluoranthene	mg/kg	0.1	3.3	4	60 - 140	82	
	Pyrene	mg/kg	0.1	3.4	4	60 - 140	85	
	Benzo(a)pyrene	mg/kg	0.1	3.6	4	60 - 140	90	
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	96
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	94
d14-p-terphenyl (Surrogate)		mg/kg	-	0.4	0.5	40 - 130	88	

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB226970.002	Arochlor 1260	mg/kg	0.2	0.5	0.4	60 - 140	125

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB227222.002	Arsenic, As	mg/kg	1	360	318.22	80 - 120	113
	Cadmium, Cd	mg/kg	0.3	5.9	4.81	70 - 130	123
	Chromium, Cr	mg/kg	0.5	41	38.31	80 - 120	106
	Copper, Cu	mg/kg	0.5	330	290	80 - 120	115
	Nickel, Ni	mg/kg	0.5	200	187	80 - 120	108
	Lead, Pb	mg/kg	1	97	89.9	80 - 120	108
	Zinc, Zn	mg/kg	2	290	273	80 - 120	108

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB227006.002	Arsenic, As	µg/L	1	21	20	80 - 120	103
	Cadmium, Cd	µg/L	0.1	21	20	80 - 120	104
	Chromium, Cr	µg/L	1	21	20	80 - 120	106
	Copper, Cu	µg/L	1	21	20	80 - 120	107
	Lead, Pb	µg/L	1	22	20	80 - 120	109
	Nickel, Ni	µg/L	1	22	20	80 - 120	108
	Zinc, Zn	µg/L	5	21	20	80 - 120	107
LB227006.026	Arsenic, As	µg/L	1	20	20	80 - 120	101
	Cadmium, Cd	µg/L	0.1	20	20	80 - 120	101
	Chromium, Cr	µg/L	1	20	20	80 - 120	99
	Copper, Cu	µg/L	1	21	20	80 - 120	105
	Lead, Pb	µg/L	1	21	20	80 - 120	105
	Nickel, Ni	µg/L	1	21	20	80 - 120	104
	Zinc, Zn	µg/L	5	22	20	80 - 120	109

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR
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Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

TRH (Total Recoverable Hydrocarbons) in Soil (continued)
Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB226970.002	TRH C10-C14	mg/kg	20	43	40	60 - 140	108
	TRH C15-C28	mg/kg	45	<45	40	60 - 140	100
	TRH C29-C36	mg/kg	45	<45	40	60 - 140	83
	TRH F Bands						
	TRH >C10-C16	mg/kg	25	41	40	60 - 140	103
	TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	98
	TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	75

VOC's in Soil
Method: ME-(AU)-[ENV]AN433

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB226974.002	Monocyclic						
	Benzene	mg/kg	0.1	4.1	5	60 - 140	81
	Aromatic						
	Toluene	mg/kg	0.1	3.8	5	60 - 140	76
	Ethylbenzene	mg/kg	0.1	4.4	5	60 - 140	88
	m/p-xylene	mg/kg	0.2	8.8	10	60 - 140	88
	o-xylene	mg/kg	0.1	4.5	5	60 - 140	90
	Surrogates						
	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.5	10	70 - 130	85
	d8-toluene (Surrogate)	mg/kg	-	8.3	10	70 - 130	83
	Bromofluorobenzene (Surrogate)	mg/kg	-	8.4	10	70 - 130	84

Volatile Petroleum Hydrocarbons in Soil
Method: ME-(AU)-[ENV]AN433

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB226974.002	TRH C6-C10	mg/kg	25	74	92.5	60 - 140	80
	TRH C6-C9	mg/kg	20	64	80	60 - 140	80
	Surrogates						
	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.5	10	70 - 130	85
	Bromofluorobenzene (Surrogate)	mg/kg	-	8.4	10	70 - 130	84
	VPH F Bands						
	TRH C6-C10 minus BTEX (F1)	mg/kg	25	48	62.5	60 - 140	77

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub-sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE220718.001	LB227223.004	Mercury	mg/kg	0.05	0.23	<0.05	0.2	105

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number	Parameter	Units	LOR	Original	Spike	Recovery%
SE220756.028	LB226970.026	Naphthalene	mg/kg	0.1	<0.1	4	84
		2-methylnaphthalene	mg/kg	0.1	<0.1	-	-
		1-methylnaphthalene	mg/kg	0.1	<0.1	-	-
		Acenaphthylene	mg/kg	0.1	<0.1	4	87
		Acenaphthene	mg/kg	0.1	<0.1	4	86
		Fluorene	mg/kg	0.1	<0.1	-	-
		Phenanthrene	mg/kg	0.1	<0.1	4	83
		Anthracene	mg/kg	0.1	<0.1	4	83
		Fluoranthene	mg/kg	0.1	<0.1	4	83
		Pyrene	mg/kg	0.1	<0.1	4	86
		Benzo(a)anthracene	mg/kg	0.1	<0.1	-	-
		Chrysene	mg/kg	0.1	<0.1	-	-
		Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	-	-
		Benzo(k)fluoranthene	mg/kg	0.1	<0.1	-	-
		Benzo(a)pyrene	mg/kg	0.1	<0.1	4	89
		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	-	-
		Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	-	-
		Benzo(ghi)perylene	mg/kg	0.1	<0.1	-	-
		Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2	-	-
		Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	-	-
		Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	-	-
		Total PAH (18)	mg/kg	0.8	<0.8	-	-
		Surrogates					
		d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	-	98
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	-	96
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	-	92

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE220718.001	LB227222.004	Arsenic, As	mg/kg	1	48	4	50	88
		Cadmium, Cd	mg/kg	0.3	46	<0.3	50	91
		Chromium, Cr	mg/kg	0.5	75	29	50	94
		Copper, Cu	mg/kg	0.5	54	0.5	50	107
		Nickel, Ni	mg/kg	0.5	52	1.6	50	100
		Lead, Pb	mg/kg	1	59	11	50	95
		Zinc, Zn	mg/kg	2	56	6.4	50	99

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE220610A.010	LB227006.004	Zinc, Zn	µg/L	5	25	<5	20	115

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

QC Sample	Sample Number	Parameter	Units	LOR	Original	Spike	Recovery%
SE220756.028	LB226970.025	TRH C10-C14	mg/kg	20	<20	40	118
		TRH C15-C28	mg/kg	45	<45	40	118
		TRH C29-C36	mg/kg	45	<45	40	98
		TRH C37-C40	mg/kg	100	<100	-	-
		TRH C10-C36 Total	mg/kg	110	<110	-	-
		TRH >C10-C40 Total (F bands)	mg/kg	210	<210	-	-
		TRH >C10-C16	mg/kg	25	<25	40	115
		TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	-	-
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	115
		TRH >C34-C40 (F4)	mg/kg	120	<120	-	-

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number	Parameter	Units	LOR
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Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub-sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

VOC's in Soil (continued)

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE220737.001	LB226974.004	Monocyclic	Benzene	mg/kg	0.1	3.6	<0.1	5	72
			Aromatic	Toluene	mg/kg	0.1	3.4	<0.1	5
			Ethylbenzene	mg/kg	0.1	4.1	<0.1	5	81
			m/p-xylene	mg/kg	0.2	8.2	<0.2	10	82
			o-xylene	mg/kg	0.1	4.2	<0.1	5	84
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	7.9	8.5	10	79
			d8-toluene (Surrogate)	mg/kg	-	7.4	6.5	10	74
			Bromofluorobenzene (Surrogate)	mg/kg	-	8.1	8.1	10	81
		Totals	Total Xylenes	mg/kg	0.3	12	<0.3	-	-
			Total BTEX	mg/kg	0.6	24	<0.6	-	-

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%	
SE220737.001	LB226974.004	TRH C6-C10	mg/kg	25	65	<25	92.5	69	
		TRH C6-C9	mg/kg	20	56	<20	80	70	
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	7.9	8.5	10	79
			d8-toluene (Surrogate)	mg/kg	-	7.4	6.5	10	74
			Bromofluorobenzene (Surrogate)	mg/kg	-	8.1	8.1	-	81
		VPH F	Benzene (F0)	mg/kg	0.1	3.6	<0.1	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	41	<25	62.5	65

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: $RPD = | \text{OriginalResult} - \text{ReplicateResult} | \times 100 / \text{Mean}$

The original result is the analyte concentration of the matrix spike. The Duplicate result is the analyte concentration of the matrix spike duplicate.

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: $MAD = 100 \times \text{SDL} / \text{Mean} + \text{LR}$

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifier when outside suggested criteria. Refer to the footnotes section at the

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

QC criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found here : https://www.sgs.com.au/~media/Local/Australia/Documents/Technical Documents/MP-AU-ENV-QU-022_QA_QC_Plan.pdf

- * NATA accreditation does not cover the performance of this service.
- ** Indicative data, theoretical holding time exceeded.
- *** Indicates that both * and ** apply.
- Sample not analysed for this analyte.
- IS Insufficient sample for analysis.
- LNR Sample listed, but not received.
- LOR Limit of reporting.
- QFH QC result is above the upper tolerance.
- QFL QC result is below the lower tolerance.
- ① At least 2 of 3 surrogates are within acceptance criteria.
- ② RPD failed acceptance criteria due to sample heterogeneity.
- ③ Results less than 5 times LOR preclude acceptance criteria for RPD.
- ④ Recovery failed acceptance criteria due to matrix interference.
- ⑤ Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
- ⑥ LOR was raised due to sample matrix interference.
- ⑦ LOR was raised due to dilution of significantly high concentration of analyte in sample.
- ⑧ Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
- ⑨ Recovery failed acceptance criteria due to sample heterogeneity.
- ⑩ LOR was raised due to high conductivity of the sample (required dilution).
- † Refer to relevant report comments for further information.

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