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ALTIS PROPERTY PARTNERS PTY LTD

Detailed Site Investigation

28 Elizabeth Street, Liverpool

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Author	Report Reviewer
	
SHARON LI **Environmental/Geotechnical Engineer**	**GREG BRICKLE** **Principal Environmental Scientist**

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EXECUTIVE SUMMARY

Altis Property Partners Pty Ltd ('the Client') engaged EI Australia (EI) to complete a Detailed Site Investigation (DSI) of the land parcel located at 28 Elizabeth Street, Liverpool NSW ('the Site').

The site is located within the Local Government Area (LGA) of Liverpool City Council (Council), as shown in **Figure 1** (**Appendix A**), and covers a total area of 3,500 m^2 (**Figure 2**, **Appendix A**). The site is further identified as Lot 1 in DP 1261270. At the time of this assessment the Site was vacant and all structures had been demolished. The Site was covered by slab on ground while the southern end of the Site was unpaved and overgrown with grass and weeds.

Based on the information provided by the client, the Site is to be redeveloped into a multistorey mixed used building over four levels of basement. No development plans were provided to EI at the time of reporting. A summary of the previous investigation is provided in **Section 3.** A DSI is required to demonstrate the suitability of the Site for the proposed redevelopment.

Key Findings

- The Site was previously used as a service station and a car park. All surface features had previously been demolished and removed from the site;
- The site and neighbouring properties were free of statutory notices and licensing agreements issued under the *Contaminated Land Management Act 1997* and *List of NSW Contaminated Sites Notified to the EPA*. The site was not included on the *Protection of the Environment Operations Act 1997*;
- The site was partially paved at grade (ground level) with concrete hardstand, and unpaved areas were overgrown with weeds and grass;
- Some surface oil staining was observed within the western area of the Site;
- No asbestos containing material (ACM) was observed on the surface across the site. However, fragments of potential ACM and damaged Telstra pits were observed in a previous inspection (2 April 2019);
- Four underground storage tanks (USTs) were located in situ by ground penetrating radar (GPR) survey at the northern area of the site near Elizabeth Street. Field inspection also identified UST fill points and bowser footings. One UST was located in the centre of the site near footprint of the former building. This indicates that infrastructure associated with an underground petroleum storage system (UPSS) remains in place at the site;
- A total of 12 subsurface assessment locations (BH201 to BH212) were drilled and soil samples were collected. Monitoring wells were installed in three of these locations (BH201M, BH202M and BH205M).
- The sub-surface comprised a layer of silty clay and sandy clay fill to 1.0m below ground level (BGL), overlying natural residual clays, then weathered shale bedrock. Sand fill, to a depth of 3.5m BGL, was identified at BH202M located near the UST area;
- Standing water levels of groundwater ranged between 2.97 and 3.76 m BGL;
- Hydrocarbon odour was identified in sand fill at location BH202M near the UST area
- Soil investigation levels applicable to a proposed land use equivalent to a setting of residential with minimal opportunities for soil access were adopted for the site investigation.
- Laboratory analytical results for the representative soil samples all complied with the adopted SILs except for:

  - The heavy metals nickel (87 mg/kg) in sample BH209_0.2-0.3 and zinc (250 mg/kg) in sample BH203_0.1-0.2, which were above ecological based criteria; and
  - Asbestos was detected in shallow fill in samples BH207_0.2-0.3, BH209_0.2-0.3 and BH201_0.2-0.3.
- Laboratory analytical results for the groundwater samples all complied with the adopted groundwater investigation levels (GILs), except for:
  - Chromium in BH202M (120 µg/L);
  - Copper in BH201M (120 µg/L);
  - Nickel in BH205M (13 µg/L); and
  - Zinc in BH201M (17 µg/L), BH202M (51 µg/L), and BH205M (63 µg/L).
- Petroleum hydrocarbons and polycyclic aromatic hydrocarbons (PAHs) were either non-detected or reported at low concentration in soil and groundwater at the site. This indicates that impact to soil and groundwater from previous use as a service station has been negligible.

The primary sources for elevated concentrations of heavy metals in groundwater at the site are currently unknown. It is expected that the reported concentrations in groundwater are likely to be indicative of regional groundwater quality.

Based on the findings from this soil and groundwater field investigation which was conducted in accordance with the investigation scope agreed with the Client, and with consideration of the Statement of Limitations (**Section 11**), EI conclude that widespread contamination was not identified on the Site.

In view of the proposed development scope, and currently available information, EI consider that the Site can be made suitable for proposed land use equivalent to a setting of residential with minimal opportunities for soil access, provided the recommendations below are implemented:

- Preparation and implementation of a Remedial Action Plan (RAP), which should:
  - Provide a sampling and quality plan (SAQP) for assessment and validation of remediation activities to be performed on-site.
  - Complete one round of groundwater monitoring at existing wells to confirm the concentration of metals, particularly chromium.
  - Assess the lateral extent of asbestos impact reported in shallow fill at locations BH207, BH209 and BH210, and at the previously identified Telstra pits after removal of the concrete slab and services across the Site.
  - Allow for the removal and offsite disposal of all UPSS, associated infrastructure and hydrocarbon impacted soils according to EPA (2014) Technical Note: Investigation of Service Station Sites;
  - Provide requirements for validation sampling following remediation of the UPSS area, surface oil staining area, and asbestos impacted areas identified at the site;
  - Provide an unexpected finds protocol;
  - Provide the requirements and procedures for waste classification assessment including further sampling, in order to enable classification of soils to be excavated and disposed

off-site during the proposed basement excavation, in accordance with the EPA (2014) *Waste Classification Guidelines*.

- Undertake remediation and validation works for the site, as outlined in the RAP.
- Any material being imported to the Site (i.e. for landscaping or levelling purposes) should be assessed for potential contamination in accordance with NSW EPA guidelines as being suitable for the intended use or be classified as VENM; and
- Preparation of a final Site Validation Report certifying Site suitability of soils and groundwater for the proposed land use.

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1. INTRODUCTION

1.1 Background and Purpose

At the request of Altis Property Partners Pty Ltd ("the Client") was engaged to assist with a soil and groundwater assessment for the site located at 28 Elizabeth Street, Liverpool NSW ("the Site"). The site is legally identified as Lot 1 in DP 1261270 and located within the Local Government Authority of Liverpool City Council (**Figure 1**, **Appendix A**). The site, covers an area of approximately 3,500 m^2 (**Figure 2**, **Appendix A**).

Based on the information provided by the client, the Site is to be redeveloped into a multistorey mixed used building over four levels of basement. No development plans were provided to EI at the time of reporting.

At the time of this assessment the Site was vacant and all structures had been demolished. The Site was covered by slab on ground while the southern end of the Site was unpaved and overgrown with grass and weeds.

This report follows on from previous investigations completed at the Site by EI Australia, referenced as follows:

- EI (2019a), "*Geotechnical Investigation Report, 28 Elizabeth Street, Liverpool, NSW*", (EI report Ref. E24175.G03, 22 May 2019); and
- EI (2019b), "*Preliminary Site Investigation, 28 Elizabeth Street, Liverpool, NSW*", (EI report Ref. E24175.E01, 29 April 2019).

1.2 Regulatory Framework

The following regulatory framework and guidelines were considered during this DSI:

- *Contaminated Land Management Act 1997*;
- *Protection of the Environment Operations Act 1997*;
- *Environmental Planning and Assessment Act 1979*; in particular
- *State Environmental Planning Policy 55 - Remediation of Land* (SEPP 55);
- *Liverpool Local Environmental Plan 2008;*
- EPA (1995) *Sampling Design Guidelines*;
- EPA (2014) *Waste Classification Guidelines*;
- EPA (2017) *Guidelines for the NSW Site Auditor Scheme*;
- EPA (2020) *Consultants Reporting on Contaminated Land;*
- NEPC (2013) *Schedule B (1) Guideline on Investigation Levels for Soil and Groundwater*;
- NEPC (2013) *Schedule B (2) Guideline on Site Characterisation*.

1.3 Project Objectives

The objectives of this investigation were to:

- Establish the degree of any site contamination, by means of intrusive sampling and laboratory analysis for the contaminants of potential concern (COPC);

- Provide conclusions regarding suitability of the site for the proposed development; and
- Make recommendations for the appropriate management of any contaminated soils and/or groundwater (if identified).

1.4 Scope of Works

To achieve the above objectives, the following scope of works was completed:

Desktop Study

- Review of relevant (hydro)geological and soil landscape maps for the project area;
- Searches of public registers maintained by the NSW Environment Protection Authority (EPA) for statutory notices and licensing agreements issued under the *Contaminated Land Management Act 1997* and *Protection of the Environment Operations Act 1997*;
- A search of the *List of NSW Contaminated Sites Notified to the EPA*;
- A site walkover inspection; which included
  - A review of existing underground services on-site, completed with assistance from Dial-Before-U-Dig (DBYD) plans and electro-magnetic equipment; and
  - GPR Scanning to identify the location of the existing Underground Storage Tanks (USTs).
- A review of the previous environmental reports.

Fieldwork and Laboratory Analysis

- Construction of test boreholes at 12 locations (which is in accordance with the EPA [1995] *Sampling Design Guidelines*) using a auger drill distributed in a triangular grid pattern across accessible areas of the site;
- Construction of 3 groundwater monitoring bores drilled to a maximum depth of 9m (or refusal) both up gradient and downgradient of the proposed redevelopment area. Groundwater monitoring bores were constructed to standard environmental protocols to investigate the potential for groundwater contamination, and migration of contaminants off-site;
- Multiple level soil sampling within fill and natural soils and one round of groundwater sampling from the three newly constructed groundwater monitoring bores; and
- Laboratory analysis of selected soil samples for relevant analytical parameters as determined from the site history survey and field observations during the investigation program.

Data Analysis and Reporting

This report documents all desk study findings, the conceptual site model, data quality objectives, investigation methodologies and results. It also provides a record of observations made during the site walkover inspection, borehole and monitoring well construction logs and a discussion of laboratory analytical results in regards to potential risks to human health, the environment and the aesthetic uses of the land.

2. SITE DESCRIPTION

2.1 Property Identification, Location and Physical Setting

The site identification details and associated information are presented in **Table 2-1**, while site locality and assessment area are illustrated in **Appendix A**, **Figures 1** and **2**.

Table 2-1 Site Identification

Attribute	Description
Street Address	28 Elizabeth Street, Liverpool NSW
Site Coordinates	Northern corner of the site (datum GDA94-MGA56): Easting: 308226.013 Northing: 6244722.098 (Source: https://maps.six.nsw.gov.au)
Site Area	3,500 m²
Lot and DP	1 in DP1261270
LGA	Liverpool City Council
Parish	St Luke
County	Cumberland
Current Zoning	B4 – Mixed Use (Liverpool Local Environmental Plan 2008)

2.2 Surrounding Land Use

The site is situated in a predominantly commercial area, as described in **Table 2-2**. The local sensitive receptors within close proximity to the site are also identified in this table.

Table 2-2 Surrounding Land Uses

Direction	Land Use Description	Sensitive Receptors
North	Elizabeth Street followed by a church	Notable areas of land surrounding the site were: ▪ Bigge Park (130m east to the site); ▪ Georges River (400m south-east to the site) ▪ Residential properties; ▪ Commercial land users; ▪ Development and maintenance workers; ▪ Sumer Child Care (300m south west to the site)
East	Vacant lot	
South	Unnamed lane followed by Liverpool Police Station	
West	George Street followed by commercial properties	

2.3 Regional Setting

The topography, (hydro)geology and soil landscape information is summarised in **Table 2-3**.

Table 2-3 Regional Setting

Attribute	Description
Topography	The regional topography consists of gently undulating plains to rolling rises with slopes usually <5%. The site was observed to slope downwards from west to east at approximately 5°.
Site Drainage	Site drainage is likely to be consistent with the general slope of the site. Stormwater is likely to be collected by pit and pipe drainage, and drain to the municipal stormwater and then to Georges River.
Regional Geology	With reference to the 1:100 000 scale Geological Series Sheet 9030 (Penrith) the site is likely to be underlain by Bringelly Shale, a formation of the Wianamatta Group. Bringelly Shale typically comprises *shale, carbonaceous claystone, claystone, laminite, fine-medium grained lithic sandstone, rare coal and tuff*.
Soil Landscape	The Soil Conservation Service of NSW Soil Landscapes of the Penrith 1:100,000 Sheet (Chapman and Murphy, 2002) indicates that the site overlies a *Residual landscape – Blacktown.* Soils are identified as shallow to moderately deep (>100 cm) hard setting mottled texture contrast soils, red and brown Podzolic soils on crests grading to yellow Podzolic soils on lower slopes and in drainage lines (Ref: Chapman and Murphy, 2002).
Acid Sulfate Soil (ASS) Risk	The Liverpool Local Environmental Plan 2008 Acid Sulfate Soils Map (Sheet ASS_011 shows the site to be within areas mapped as *Class 5* Acid Sulfate Soils (ASS). Class 5 areas are likely to locate ASS during works within 500 metres of adjacent Class 1, 2, 3, or 4 land which are likely to lower the water table below 1 metre AHD on adjacent Class 1, 2, 3 or 4 land. Visual indicators of actual and potential ASS were not observed during previous geotechnical field investigations (2019a). As such, EI consider that it is unlikely for ASS to be present on site and the need for an ASS management plan was unwarranted.
Nearest Surface Water Feature	Georges River (400m southeast).
Groundwater Flow Direction	Groundwater flow is anticipated to be southeast towards Georges River.

2.4 EPA Online Records

On 27 November 2020, an on-line search of the contaminated land public record maintained by the EPA was conducted. This search confirmed that the EPA had no regulatory involvement (i.e. notices) in relation to the area of investigation, nor for any properties in its proximity (<500m radius). The contaminated land public record is a searchable database of:

- Orders made under Part 3 of the *Contaminated Land Management Act 1997* (CLM Act);
- Approved voluntary management proposals under the CLM Act that have not been fully carried out and where the approval of the EPA has not been revoked;
- Site Audit Statements provided to the EPA under Section 53B of the CLM Act that relate to significantly contaminated land;

- Where practicable, copies of any documentation formerly required to be part of the public record; and
- Actions taken by the EPA under Sections 35 and 36 of the *Environmentally Hazardous Chemicals Act 1985*.

A search through the *List of NSW Contaminated Sites Notified to the EPA* under Section 60 of the CLM Act 1997 was also conducted on 27 November 2020. This list includes properties on which contamination has been identified, but is not deemed to be impacted significantly enough to warrant regulation. The site was not listed, nor for any properties in its proximity (<500m radius).

A search of the *Protection of the Environment Operations (POEO) Act 1997* public register for environmental protection licences, applications, notices, audits, pollution studies and reduction programmes, was conducted on 27 November 2020. The site was not listed; however, one site was found within a 500m proximity to the site:

- Healthscope Operations Pty Ltd (Trading as: Lady Davidson Private Hospital) 40 Bigge St, LIVERPOOL, NSW 2170 (notice number 12839) was notified to EPA as POEO Public Register (460m north-east to the site). EI consider this is not a cause for concern because the licence of the notified site is no longer in force, further the regional geology (clay and shale) would likely limit the migration of potential contamination.

2.5 Site Walkover Inspection

Observations were recorded during a walkover inspection of the site conducted on 9 November 2020. These are summarised below. The general site layout is shown on **Figure 2**. Refer also to photographs attached in **Appendix C**.

- Site topography was relatively flat with a minor slope to the south along George Street with Elizabeth street sloping to the east;
- Four USTs were located by GPR survey in the north part of the site the near along Elizabeth Street;
- One waste oil UST was located by GPR in the central portion of site;
- The Site was previously used as a service station and a car park that was partially paved at grade (ground level). Unpaved areas were overgrown with weeds and grass;
- Hydrocarbon odour was identified within one location near the Underground Petroleum Storage System (UPSS) and some oil staining was also observed within the western area of the Site; and
- No ACM was observed at the surface across the Site.
    - Note: Fragments of potential ACM were observed during a previous site inspection (in the central southern portion and north eastern corner of site) this was considered to be associated with two damaged Telstra pits along the eastern boundary of site observed at that time

3. PREVIOUS INVESTIGATION

The following environmental report was reviewed as part of this investigation:

- EI (2019b), "*Preliminary Site Investigation, 28 Elizabeth Street, Liverpool, NSW*", (EI report Ref. E24175.E01, 29 April 2019).

A summary of this report is provided in **Table 3-1**.

Table 3-1 Summary of Previous Investigation

Task	Findings
EI (2019b) Preliminary Site Investigation	
Objective	To provide a qualitative assessment of the environmental conditions of the site by appraising the potential for site contamination on the basis of field observations, historical land uses, anecdotal and documentary evidence.
Findings	▪ Land titles records and historic aerial photography indicated that the site was previously used for residential - market gardening purposes, prior to the construction of a commercial/industrial warehouse in the 1960s. Commercial/industrial site use continued at the site from the 1960s Records also indicated that former site use also included an operational petrol station. ▪ The site inspection identified potential asbestos containing materials across the ground surface, poor concrete condition, mixed aggregate, oil waste, overgrown weeds with accessible soils in the southern portion, one groundwater monitoring well in the north-eastern corner and the existence of potentially four USTs; ▪ The site has not reported as being subject to regulation in relation to environmental impacts, as documented in the EPA public registers. Further to this no other sites within 500m radius of the site have been reported. A search of the Protection of the Environment Operations (POEO) Act, did not identify any record for the site although three sites were identified within a 500 m radius; ▪ Records from SafeWork NSW did not indicate historical storage of chemicals and underground storage tanks at the site. Anecdotal information, however, indicated UPSS to be present and USTs likely remained in-situ; ▪ Records from Liverpool Council identified potential activities, such as demolition of existing structures that could lead to potential contamination of shallow surface soils at site; ▪ The presence of a number of contaminating sources at the site, including imported filling, former commercial/industrial uses (i.e. service station), pesticides from market garden use, as well as hazardous building materials from former demolitions, etc., indicate a potential for contamination to be present. In light of this, the CSM developed identified a number of potential exposure pathways which may present a risk to future users of the site and to workers during construction and maintenance activities.
Conclusions	EI concluded that there is potential for contamination to be present on site. With consideration given to the nature of the proposed land use and potential risk of exposure to end users of the site from possible contamination, an intrusive detailed site investigation should be completed to understand the quality of site soils and groundwater.

4. CONCEPTUAL SITE MODEL

In accordance with NEPC (2013) *Schedule B2 – Guideline on Site Characterisation*, EI developed a conceptual site model (CSM) that assessed plausible linkages between potential contamination sources, migration pathways and receptors. The CSM provides a framework for the review of the reliability and useability of the data collected and identifies gaps in the existing site characterisation.

4.1 Summary of Site History

Based on the historical information reviewed (**Section 3**), it appears that the site was used for residential properties from at least 1930s to 1960s, and then was operated as a petrol service station from 1960s until 2018.

All surface infrastructure was demolished and removed from the site at the time of a first site inspection in 2019 (**Section 3**).

4.2 Potential Contamination Sources

The contamination appraisal indicated that there was potential for contamination to occur on the site, derived from the following sources:

- Impacts from the storage and use of petroleum chemicals, in particular leaks from underground petroleum storage systems (UPSS); and
- Deep natural soils potentially containing residual impacts from UPSS representing potential secondary sources of contamination that are migrating off-site in local groundwater.
- Remnant materials from demolition of former structures and service pits (damaged Telstra pits previously observed).
- Importation of fill from unknown origin.

Per- and Poly- Fluoroalkyl Substances (PFAS)

EPA (2017) requires that PFAS are considered when assessing land contamination. EI used the following decision tree (**Table 4-1**), based on the EnRisk (2016) *Proposed Decision Tree for Prioritising Sites Potentially Contaminated with PFAS* and NEMP (2020) *PFAS National Environmental Management Plan*, for determining the potential for PFAS to be present on-site and whether PFAS sampling of soil and groundwater is required.

In this instance, the potential for PFAS contamination was low and corresponding sampling / analysis of soil and groundwater was not warranted.

Emerging Chemicals

The EPA uses chemical control orders (CCOs) as a primary legislative tool under the *Environmentally Hazardous Chemicals Act 1985* to manage chemicals of concern and limit their potential impact on the environment. Considerations for chemicals controlled by CCOs, and other potential emerging chemicals, are outlined in **Table 4-2**.

In this instance, the potential for an emerging chemical of concern to be present on-site was limited to the application of organic pesticides (around building footings and perimeters and/or in imported filling of unknown origin / quality).

Table 4-1 PFAS Decision Tree

Preliminary Screening	Probability of Occurrence[1]
Has an activity listed in NEMP (2020) [2] as being associated with PFAS contamination occurred on-site? If so, list activity.	L
Has an activity listed in NEMP (2020) [2] as being associated with PFAS contamination occurred up-gradient or adjacent to the site? If so, list activity.	L
Did fire training involving the use of suppressants occur on-site between 1970 and 2010?	L
Did fire training occur up-gradient or adjacent to the site between 1970 and 2010? [3]	L
Have "fuel" fires ever occurred on-site between 1970 and 2010? (e.g. ignition of fuel (solvent, petrol, diesel, kerosene) tanks?)	Unknown
Have PFAS been used in manufacturing or stored on-site? [4]	L
Could PFAS have been imported to the site in fill materials from a site with an activity listed in NEMP (2020)?	L
Could PFAS-contaminated groundwater or run-off have migrated on to the site?	L
Is the site or adjacent sites listed in the NSW EPA PFAS Investigation Program? [5]	L
If the probability is medium or high in any of the rows, does the site analytical suite need to be optimised to include preliminary sampling and testing for PFAS in soil (including ASLP testing) and waters?	**No**

Note 1 Probability: L – low (all necessary documentation has been reviewed and there is no recorded instance or compelling rationale); M – moderate (all necessary documentation has been reviewed and there is potential evidence of a recorded instance with compelling rationale); H – high (all necessary documentation has been reviewed and there is evidence of a recorded instance with compelling rationale).
Note 2 Activities listed in Appendix B of NEMP (2020).
Note 3 Runoff from up-gradient PFAS use may impact surface water, soil, sediment and groundwater.
Note 4 PFAS is used wide range of industrial processes and consumer products, including in the manufacture of non-stick cookware, specialised garments and textiles, Scotchguard™ and similar products (used to protect fabric, furniture, leather and carpets from oils and stains), metal plating and in some types of fire-fighting foam. (https://www.nicnas.gov.au/chemical-information/factsheets/chemical-name/perfluorinated-chemicals-pfas)
Note 5 Refer to https://www.epa.nsw.gov.au/your-environment/contaminated-land/pfas-investigation-program. *Emerging Chemicals*

Table 4-2 Emerging or Controlled Chemicals

Chemicals of Concern (CCO or emerging)	Decision
Were aluminium smelter wastes used or stored on site (CCO, 1986)?	No
Do dioxin contaminated wastes (CCO, 1986) have the potential to impact the site?[1]	No
Were organotin products (CCO, 1989) used or stored on site? [2]	No
Were polychlorinated biphenyls (PCBs) used or PCB wastes (CCO, 1997) stored on-site? [3]	No
Were scheduled chemical or wastes (CCO, 2004) used or stored?[4]	Potential for organic pesticides to have been used
Are other emerging chemicals suspected?[5]	No
If Yes to any questions, has site sampling suite been optimised to include sampling for these chemicals of concern?	**Yes**

Note 1 From burning of certain chemicals, smelting or chemical manufacturing or fire on or near the site.
Note 2 From anti-fouling paints used or removed at boat and ship yards and marinas.
Note 3 From older transformer oils and electrical capacitors
Note 4 Twenty-four mostly organochlorine pesticides and industrial by-products
Note 5 Other chemicals considered as emerging (e.g. 1,4 dioxane; associated with some CVOC).

4.3 Contaminants of Potential Concern

The COPC at the site were considered to be:

- Soil - heavy metals, total recoverable hydrocarbons (TRH), the monocyclic aromatic hydrocarbons benzene, toluene, ethylbenzene and xylenes (BTEX), polycyclic aromatic hydrocarbons (PAHs) including naphthalene and benzo(α)pyrene, phenols and asbestos.
- Groundwater – dissolved heavy metals, TRH, BTEX, VOCs, phenolic compounds (total), chlorinated hydrocarbons and PAHs.

4.4 Exposure Pathways, Receptors and Linkages

The contamination appraisal established there was potential for contamination to occur on the site. Being of high clay content, the sub-surface would restrict vertical migration of contaminants to the groundwater resource. Direct exposures were therefore of greatest concern.

The following potential receptors of site contamination were identified:

- Existing and future site occupants, in particular maintenance and service workers;
- Users of the adjacent land; and
- Ecological receptors in areas of exposed soil/landscaping.

A summary of the CSM, with identification of the potential pollutant linkages, is provided in **Table 4-3.**

Table 4-3 Conceptual Site Model

Source of Contamination	Exposure Pathway	Receptor(s)
Impacts from demolition of former structures	Dermal Contact Ingestion (dust) Inhalation	Future Site Users Adjacent Site Users
Impacts from imported fill	Dermal Contact Ingestion (dust) Inhalation	Future Site Users Adjacent Site Users
Impacts from historic service station activities	Dermal Contact Ingestion (dust) Inhalation / vapour intrusion	Future Site Users Adjacent Site Users
In-Situ USTs	Vapour Intrusion to air Leaking to soil	Future Site Users Adjacent Site Users
	Vertical migration to groundwater	Groundwater Bigge Park (170m east) Georges River (490m south east)

5. METHODOLOGY

5.1 Sampling, Analytical and Quality Plan

The SAQP ensures that the data collected during environmental works at a site are representative and provide a robust basis for assessment decisions. The SAQP for this DSI included the following:

- Data quality objectives, including a summary of the objectives of the DSI;
- Investigation methodology, including the media to be sampled, details of analytes and parameters to be monitored and a description of intended sampling points;
- Sampling procedures (including sample handling, preservation and storage);
- Field screening methods;
- Laboratory analysis methods; and
- Analytical quality assurance / quality control (QA/QC).

5.2 Data Quality Objectives

In accordance with the NEPC (2013) *Schedule B2 Guideline on Site Characterisation*, the USEPA (2006) *Data Quality Assessment* and EPA (2017) *Guidelines for the NSW Site Auditor Scheme*, data quality objectives (DQO) were developed by the EI investigation team, following the NEPM- / EPA- endorsed, seven step process (**Table 5-1**). In doing so, the appropriate levels of data quantity and quality needed for the specific requirements of the project were established.

Table 5-1 Summary of Project Data Quality Objectives

DQO Step	Details
1. State the Problem Summarise the contamination problem that will require new environmental data, and identify the resources available to resolve the problem; develop a conceptual site model.	Site history (**Section 3**) identified a range of contamination sources with potential to have impacted the site. Intrusive investigation was required to determine: ▪ Is the site suitable for the proposed residential development with minimal access to soil? and ▪ Does the site pose an unacceptable risk to human and/or ecological receptors?
2. Identify the Goal of the Study (Identify the decisions) Identify the decisions that need to be made on the contamination problem and the new environmental data required to make them.	Based on the objectives outlined in **Section 1.3**, the decisions that need to be made are: ▪ Has the nature, extent and source of any soil and/or groundwater impacts onsite been defined? ▪ What impact do the site specific, geologic and hydrogeological conditions have on the fate and transport of any impacts that may be identified? ▪ Does the level of impact coupled with the fate and transport of identified contaminants represent an unacceptable risk to identified human and/or environmental receptors on or offsite? ▪ Does the collected data provide sufficient information to allow the suitability of the site to be determined, or selection and design of an appropriate remedial strategy, if necessary? ▪ If the data does not provide sufficient information, what data gaps require closure to enable the suitability of the site to be determined, or selection and design of an appropriate remedial strategy?
3. Identify Information Inputs (Identify inputs to decision) Identify the information needed to support any decision and specify which inputs require new environmental measurements.	Inputs to the decision-making process include: ▪ Proposed development and land use; ▪ Review of the previous investigation at the site; ▪ National and NSW EPA guidelines made or approved under the *NSW Contaminated Land Management Act 1997*; ▪ Visual observation and documentation (i.e. field notes, photographs) during site works; ▪ Assessment of soil analytical results in relation to the adopted human health and ecological criteria; At the end of the assessment, a decision had to be made regarding the suitability of the site for the proposed development, or if additional investigation or remedial works were required to make the site suitable for the proposed use.
4. Define the Boundaries of the Study Specify the spatial and temporal aspects of the environmental media that the data must represent to support decision.	Lateral – The cadastral boundaries of the site; Vertical – Investigations will be advanced to the depth of natural soils or rock; Temporal – The results will be valid on the day samples are collected and will remain valid as long as no changes occur in regards to site use, and contamination (if present) does not migrate onto the site from off-site sources.

DQO Step	Details
5. Develop the Analytic Approach (Develop a decision rule) To define the parameter of interest, specify the action level, and integrate previous DQO outputs into a single statement that describes a logical basis for choosing from alternative actions.	The decision rules for the investigation were: ▪ If the concentrations of contaminants in the soil exceed the adopted criteria, then assess the need to further investigate the extent of impacts onsite. ▪ Decision criteria for QA/QC measures are defined by the Data Quality Indicators (DQI) in **Table 5-2**.
6. Specify Performance or Acceptance Criteria (Specify limits on decision errors) Specify the decision-maker's acceptable limits on decision errors, which are used to establish performance goals for limiting uncertainties in the data.	Specific limits for this project were in accordance with national and NSW EPA guidance, and appropriate indicators of data quality and standard procedures for field sampling and handling. This included the following points to quantify tolerable limits: ▪ The null hypothesis for the investigation is that the 95% Upper Confidence Limits (UCL) of the mean for contaminants of concern exceed relevant commercial land use criteria across the site. ▪ The acceptance of the site will be based on the probability that: ‣ The 95% UCL of the mean of the data will satisfy the given site criteria. Therefore, a limit on the decision error will be 5% that a conclusive statement may be incorrect; ‣ The standard deviation of the results is less than 50% of the relevant remediation acceptance criterion; and ‣ No single results exceed the remediation acceptance criteria by 250% or more. ▪ Soil concentrations for chemicals of concern that are below investigation criteria made or approved by the EPA will be treated as acceptable and indicative of suitability for the proposed land use(s). ▪ If contaminant concentrations in soil or groundwater exceed the adopted criteria, further investigation will be considered prudent. If no contamination is detected, no further action is required.
7. Develop the Detailed Plan for Obtaining Data (Optimise the design for obtaining data) Identify the most resource-effective sampling and analysis design for general data that are expected to satisfy the DQOs.	In order to identify the most resource-effective sampling and analysis design for general data that are expected to satisfy the DQO: ▪ Written instructions were issued to guide field personnel in the required fieldwork activities. ▪ 12 soil sampling locations (BH201-BH212), in accordance with the minimum points recommended for a site of 0.35 ha according to the EPA (1995) S*ampling Design Guidelines*, using a systematic triangular grid pattern across safely accessible parts of the site. ▪ An upper soil profile sample was collected at each borehole location and tested for the COPC, to assess the conditions of the fill/topsoil layer, and impacts from activities at ground level. ▪ Further discrete natural soil samples were analysed for COPC. Samples were selected based on field observations (including visual and olfactory evidence), whilst giving consideration to characterise the subsurface soil stratigraphy. ▪ In-field screening of soil headspace samples for VOC contamination was carried out with a portable Photo-Ionisation Detector (PID). ▪ Collection of groundwater samples from three constructed monitoring wells, of which one monitoring well was located near and down gradient of UST area. Analysis of groundwater samples for COPC. ▪ Review of the results was undertaken to determine if further sampling was warranted (i.e. where soil or groundwater concentrations were found to exceed the adopted criteria endorsed by the EPA, relevant to the proposed land use(s)).

5.3 Data Quality Indicators

To ensure that the investigation data were of an acceptable quality, they were assessed against the data quality indicators (DQI) outlined in **Table 5-2**, which related to both field and laboratory-based procedures. The overall assessment of data quality is discussed in **Section 6** and **Appendix H**.

Table 5-2 Data Quality Indicators

QA/QC Component	Data Quality Indicator
Precision A quantitative measure of the variability (or reproducibility) of data	Data precision was assessed by reviewing the performance of blind field duplicate sample sets, through calculation of relative percentage differences (RPD). Data precision was deemed acceptable if RPDs were found to be less than 30%. RPDs that exceeded this range were considered acceptable where: ▪ Results were less than 10 times the limits of reporting (LOR); ▪ Results were less than 20 times the LOR and the RPD was less than 50%; or ▪ Heterogeneous materials or volatile compounds were encountered.
Accuracy A quantitative measure of the closeness of reported data to the "true" value	Data accuracy was assessed through the analysis of: ▪ Split field duplicate sample sets (RPDs as above); ▪ Field and method blanks, analysed for the analytes targeted in the primary samples; ▪ Matrix spike and matrix spike duplicate sample sets; and ▪ Laboratory control samples.
Representativeness The confidence (expressed qualitatively) that data are representative of each medium present onsite	To ensure the data produced by the laboratory were representative of conditions encountered in the field, the following measures were taken: ▪ Blank samples run in parallel with field samples, to confirm there were no unacceptable instances of laboratory artefacts; ▪ Review of RPDs for field and laboratory duplicates to provide an indication that the samples were generally homogeneous, with no unacceptable instances of significant sample matrix heterogeneities; and ▪ The appropriateness of collection methodologies, handling, storage and preservation techniques was assessed to ensure/confirm there was minimal opportunity for sample interference or degradation (i.e. volatile loss during transport due to incorrect preservation / transport methods).
Completeness A measure of the amount of useable data from a data collection activity	Analytical data sets acquired during the DSI were evaluated as complete upon confirmation that: ▪ Standard operating procedures (SOPs) for sampling protocols were adhered to; and ▪ Copies of all chain of custody (COC) documentation were included and found to be properly completed. It could therefore be considered whether the proportion of "useable data" generated in the data collection activities was sufficient for the purposes of the land use assessment.
Comparability The confidence (expressed qualitatively) that data may be considered to be equivalent for each sampling and analytical event	Given that several data sets from separate sampling episodes were required, issues of comparability were reduced through adherence to SOPs and regulator-endorsed or published guidelines and standards on each data gathering activity. In addition the data were collected by experienced samplers and NATA-accredited laboratory methodologies will be employed.

5.4 Sampling Rationale

With reference to the CSM described in **Section 4**, soil sampling works were planned in accordance with the following rationale:

- Drilling of boreholes at 12 locations placed across accessible parts of the site, to characterise *in situ* soils. Sampling fill and natural soils from 12 locations for laboratory assessment;
- Installation of three groundwater monitoring wells with BH201M located hydraulically up-gradient to the site, BH202M hydraulically down-gradient of the UST area and BH205M located hydraulically down-gradient to the site;
- One groundwater monitoring event (GME) from the three newly installed groundwater wells during this investigation; and
- Laboratory analysis of representative soil and groundwater samples for COPC.

5.5 Investigation Constraints

The number of test bores drilled during the investigation phase achieved the planned investigation scope described in **Section 1.4**.

The identified UST area was not directly investigated due to safety considerations. Location BH202M was located near to the UST area.

5.6 Assessment Criteria

The assessment criteria adopted for this DSI are outlined in **Table 5-3**. These were selected from available published guidelines that are endorsed by national or state regulatory authorities, with due consideration of the exposure scenarios that are expected for various parts of the site, the likely exposure pathways, and the identified potential receptors. For the purposes of this DSI, the adopted criteria were termed *Soil Investigation Levels* (SILs).

Table 5-3 Adopted Investigation Levels for Soil and Groundwater

Environmental Media	Adopted Guidelines	Rationale
Soil	NEPC (2013) HILs, HSLs, and Management Limits for TRH	▪ Soil Health-based Investigation Levels (HILs) ‣ NEPC (2013) HIL-B for land use Residential with minimal opportunities for soil access. ▪ Soil Health-based Screening Levels (HSLs) ‣ NEPC (2013) HSL-D for commercial / industrial sites as the proposed development is residential apartments over basement car parking, per Section 2.4.8 of Schedule B1, NEPC (2013) ▪ Asbestos HSLs: Presence / absence of asbestos (not-detected; 0.01% w/w semi-quantitation limit) were adopted for preliminary screening purposes. ▪ Management Limits for Petroleum Hydrocarbons ‣ Where the HSLs for petroleum hydrocarbons were exceeded, sample results were assessed against the NEPC (2013) Management Limits for the F1-F4 TRH fractions, to assess propensity for phase-separated hydrocarbons (PSH), fire and explosive hazards and adverse effects on buried infrastructure.

Environmental Media	Adopted Guidelines	Rationale
		▪ Ecological Investigation and Screening Levels (EIL/ESLs) ‣ NEPM 2013 ESLs for selected petroleum hydrocarbons & TRH fractions for protection of terrestrial ecosystems. **Asbestos** ▪ Presence/Absence (for initial screening purposes)
Groundwater	ANZG (2018) and NEPC (2013)	**Groundwater Investigation Levels (GILs)** ▪ ANZG (2018) Groundwater Investigation Levels for Fresh Waters. **Health-based Screening Levels (HSLs)** ▪ NEPC (2013) HSL-D for commercial / industrial sites. **Recreational Water** ▪ NHRMC (2011 – update August 2018 v.3.5) Drinking Water Guidelines.

5.7 Soil Sampling

The soil sampling works conducted at the site are described in **Table 5-4**. Sampling locations are illustrated in **Figure 2** (**Appendix A**).

Table 5-4 Summary of Soil Sampling Methodology

Activity/Item	Details
Fieldwork	Intrusive borehole drilling and soil sampling were conducted on 9 November 2020, A total of 12 boreholes (BH201-BH212) were drilled for the current investigation.
Method	All test bores were drilled using a Hanjin drill rig, fitted with solid flight augers. Borehole details are presented in the detailed logs, attached in **Appendix D**.
Soil Logging	Drilled soils were classified in the field with respect to lithological characteristics and evaluated on a qualitative basis for odour and visual signs of contamination. Soil classifications and descriptions were based on Australian Standard (AS) 1726-2017. Sample descriptions are included in the borehole logs, presented in **Appendix D**.
Soil Sampling	Soil samples were collected using a dry grab method (the sampler wearing unused, dedicated nitrile gloves) and placed into laboratory-supplied, acid-washed, solvent-rinsed glass jars, or snap-lock, plastic bags. Blind and split field duplicates were separated from the primary samples and placed into dedicated glass jars. At each location, aliquots of soil were placed into separate zip-lock bags for asbestos and for in-field VOC screening, the latter performed using a photo-ionisation detector (PID).
Field Observations (including visual and olfactory signs of contamination)	A summary of field observations is provided as follows: ▪ Ash and slag were not observed in any of the examined soils; ▪ No visual signs of contamination, such as fragments of fibre cement sheeting (FCS), were observed in any of the examined soils; and ▪ No significant odour or staining was detected in any of the examined soil samples. ‣ Minor petroleum odour was noted in soil samples collected from the fill horizon at location BH202M
Soil Vapour Screening	Screening for VOC was performed in the field using a portable PID, fitted with a 10.9eV lamp (**Appendix E**). Low PID readings were recorded (≤10 ppm), consistent with the non-detection of any suspicious odour.
Decontamination Procedures	Nitrile sampling gloves were replaced between each sampling location. Samples were collected from a different part of the solid flight auger and the auger was cleaned from all residual soil waste between each borehole location.
Management of Soil Cuttings	Soil cuttings were used as backfill for completed boreholes.
Sample Preservation and Transport	Samples were stored in a chilled (with ice packs) chest, whilst on-site and in transit to the contracted laboratories. Soil samples were transported to SGS Environmental Services (SGS; the primary laboratory) under strict chain-of-custody (COC) conditions. Signed COC certificates and sample receipt advice (SRA) were provided by SGS for confirmation purposes (**Appendix F**). A split (inter-laboratory) soil field duplicate was submitted to Envirolab Services Pty Ltd (Envirolab; the secondary laboratory) under strict COC conditions. Signed COC forms and SRA were provided by Envirolab for confirmation purposes (**Appendix F**).
Laboratory Analysis and Quality Control	Soil samples were analysed by SGS and Envirolab for the COPC. All samples were analysed within the required holding period, as documented in the corresponding laboratory reports (**Appendix G**). In addition to the split (inter-laboratory) field duplicate (QT1; analysed by Envirolab), QC testing comprised one blind (intra-laboratory) field duplicate (QD1), an equipment rinsate blank, a laboratory-prepared, trip spike soil sample and a laboratory-

Activity/Item	Details
	prepared, trip blank soil sample, all analysed by SGS.

5.8 Groundwater Investigation

The groundwater investigation works conducted at the site are described in **Table 5-5**. The monitoring well locations (BH201M, BH202M and BH205M) are illustrated in **Figure 2**.

Table 5-5 Summary of Groundwater Investigation Methodology

Activity/Item	Details
Fieldwork	The groundwater monitoring wells (BH201M, BH202M and BH205M) were installed on 9 November 2020 and developed on the same day. Water level gauging, well purging, field testing and groundwater sampling were conducted on 17 November 2020.
Well Construction	Well construction details are tabulated in **Table 7-2** and documented in the BH201M, BH202M and BH205M bore log presented in **Appendix D**. The well was installed to screen the shale aquifer within the interval 6-9m BGL. Well construction was in general accordance with the standards described in NUDLC (2012) and involved the following: ▪ 50 mm, Class 18 uPVC, threaded, machine-slotted screen and casing, with slotted intervals in shallow wells set to screen to at least 500 mm above the standing water level to allow sampling of phase-separated hydrocarbon product, if present; ▪ Base and top of each well was sealed with a uPVC cap; ▪ Annular, graded sand filter was used to approximately 300 mm above top of screen interval; ▪ Granular bentonite was applied above annular filter to seal the screened interval; ▪ Drill cuttings were used to backfill the bore annulus to just below ground level; and ▪ Surface completion comprised a steel road box cover set in neat cement and finished flush with the concrete slab level.
Well Development	Well development was conducted on the same day after the installation. This involved agitation within the full length of the water column using a dedicated, high density polyethylene (HDPE), disposable bailer, followed by removal of water and accumulated sediment using a 12V, HDPE submersible bore pump (Proactive Environmental, model *Super Twister*). Pumping was continued until no further reduction in suspended sediment was observed (i.e. after removal of several well volumes).
Well Gauging and Groundwater Flow Direction	All monitoring wells were gauged for standing water level (SWL, depth to groundwater) prior to well purging at the commencement of the GME on 17 November 2020 and the measured SWL is shown in **Table 7-2.** Groundwater flow direction was assumed to be southeast.
Well Purging and Field Testing	No volatile organic odours, sheen or phase separated hydrocarbons (PSH) were detected during any stage of well purging. Measurement of water quality parameters (dissolved oxygen (DO), electrical conductivity (EC), reduction / oxidation potential (Redox), pH and temperature (T)) was conducted repeatedly during well purging and values were recorded onto field data sheets (**Appendix E**). Groundwater was initially observed to be grey/brown in colour with suspended sediments. The suspended sediment level reduced as purging continued. Purged water volumes removed from each well and field test results are summarised in **Table 7-3**.

Activity/Item	Details
Groundwater Sampling	Groundwater was sampled using a micro-purge system. Water was continuously measured for temperature, EC, Redox, DO and pH. Once three consecutive field measurements were recorded to within ±10% for DO, ±3% for EC, ±0.2 for pH, ±0.2°C for T and ±20mV for Redox, this was considered to indicate that representative groundwater quality had been achieved and final physico-chemical measurements were recorded. Groundwater samples were then collected from the micro-purge sampling pump discharge point.
Decontamination Procedure	Decontamination was not required as sampling equipment was stored and transported prior to use in factory-sealed, plastic sleeves, and each bladder was dedicated to and replaced new at each individual well. All sample containers were supplied by the laboratory for the particular project and only opened once immediately prior to sampling. Ice was used to keep the samples cool, melt water was continuously drained from the esky to prevent cross-contamination of samples. The water level probe and water quality kit probes were washed in a solution of potable water and *Decon 90* and then rinsed with potable water between measurements/wells.
Sample Preservation	Sample containers were supplied by the laboratory with the following preservatives: ▪ one, 1 litre amber glass, acid-washed and solvent-rinsed bottle; ▪ two, 40ml glass vials, pre-preserved with dilute hydrochloric acid, Teflon-sealed; and ▪ one, 250mL, HDPE bottle, pre-preserved with dilute nitric acid (1 mL). Samples for metals analysis were field-filtered using 0.45 µm pore-size membranes. All containers were filled with sample to the brim then capped and stored in ice-filled chests, until completion of the fieldwork and during sample transit to the laboratory.
Sample Transport	After sampling, refrigerated sample chests were transported to SGS using strict COC procedures. SRA was provided by the laboratory to document sample condition upon receipt. Copies of the SRA and COC certificates are presented in **Appendix F**.
Laboratory Analysis and Quality Control (QC)	All groundwater samples were submitted to SGS for analysis of the previously-identified COPC. QA/QC testing comprised an intra-laboratory (blind field) duplicate, a rinsate blank, a trip blank and a trip spike, all tested by SGS.

6. DATA QUALITY ASSESSMENT

The assessment of data quality is defined as the scientific and statistical evaluation of environmental results to determine if they meet the objectives of the project (USEPA, 2006). For this DSI, data quality assessment involved an evaluation of the compliance of the field (sampling) and laboratory procedures with established protocols, as well as the accuracy and precision of the associated results from the quality control measures. The findings are summarised in **Table 6-1** and discussed in detail in **Appendix H**.

In summary, the overall quality of the analytical data from this DSI was considered to be of an acceptable standard for interpretive use and preparation of an updated CSM.

Table 6-1 Quality Assurance Process

Stage	Control	Conformance [Yes, Part, No]	Report Section(s)
Preliminaries	Data Quality Objectives established	Yes	**Section 5**
Field Work	Suitable documentation of fieldwork observations including borehole logs, field notes	Yes	**Appendices D, E** and **F**
Sampling Plan	Use of relevant and appropriate sampling plan (density, type, and location)	Yes	See sample rationale (**Section 5.4**)
	All media sampled and duplicates collected	Yes	See results summary table in **Appendix B**
	Use of approved and appropriate sampling methods (soil, groundwater)	Yes	**Section 5.6**
	Selection of soil samples according to field PID readings (where VOCs are present)	Yes	**Section 7**
	Preservation and storage of samples upon collection and during transport to the laboratory	Yes	**Section 5.6**
	Appropriate rinsate, field and trip blanks taken	Yes	**Appendix H**
	Completed field and analytical laboratory sample COC procedures and documentation	Yes	**Appendices F** and **G**
Laboratory	Sample holding times within acceptable limits	Yes	**Appendices H** and **I**
	Use of appropriate analytical procedures and NATA-accredited laboratories	Yes	**Appendices H** and **I**
	LOR/PQL low enough to meet adopted criteria	Yes	**Appendices H** and **I**
	Laboratory blanks	Yes	**Appendices H** and **I**
	Laboratory duplicates	Yes	**Appendices H** and **I**
	Matrix spike/matrix spike duplicates	Yes	**Appendices H** and **I**
	Surrogates	Yes	**Appendices H** and **I**
	Analytical results for replicated samples, including field and laboratory duplicates and inter-laboratory duplicates, expressed as	Yes	**Appendices H** and **I**

Stage	Control	Conformance [Yes, Part, No]	Report Section(s)
	RPD		
	Checking for the occurrence of apparently unusual or anomalous results, e.g. laboratory results that appear to be inconsistent with field observations or measurements	Yes	**Appendices B**, **F**, **H** and **I**
Reporting	Report reviewed by senior staff to assess project meets desired quality, EPA guidelines and project outcomes.	Yes	See Report Distribution page at front of report.

7. RESULTS

7.1 Field Inspection

A GPR survey was conducted at 28 Elizabeth St, Liverpool on 7th November 2020 (**Appendix E**). The GPR scan confirmed 5 Underground Storage Tanks exist at this site. Four Tanks are located within the same Tank farm on the Elizabeth St side of the site. A fifth tank was located towards the middle of the site, adjacent east of the now demolished building. Field inspection identified related infrastructure including UST fill points, and bowser foot prints. It is likely that sub-surface UPSS infrastructure from the former service operation remains in place at the site.

7.2 Soil Investigation Results

7.2.1 Subsurface Conditions

The general site lithology encountered during the drilling of the test boreholes (and installation of the monitoring well) was identified to be a layer of silty clay and sandy clay fill overlying natural residual silty clay and then shale bedrock. Sand fill was encountered at BH202M located in proximity to the UST area. The information obtained during the investigation is summarised further in **Table 7-1** and borehole logs from these works are presented in **Appendix D**.

Table 7-1 Generalised Subsurface Profile

Layer	Description	Depth to top and bottom of layer (mBGL)
Fill	Silty CLAY; medium to high plasticity, dark brown, with trace of sub-angular to angular gravels, no odour. Sandy CLAY; low plasticity, brown, fine grained sand and trace of sub-angular to angular gravels, no odour.	0.0-1.0 3.5m of sand fill was encountered at BH202 only & minor petroleum odour observed
Natural	Silty CLAY; medium to high plasticity, grey, orange mottled red, no odour.	1.0-6.0
Bedrock	SHALE; pale brown, moderately weathered, no odour.	6.0-9.0 +

+ = termination depth of deepest borehole

7.2.2 Field Observations and PID Results

Soil samples were obtained from the test bores at various depths ranging between 0-4.0m BGL. All examined soil samples were evaluated on a qualitative basis for odour and visual signs of contamination (e.g. hydrocarbon odours, oil staining, petrochemical filming, asbestos fragments, ash, charcoal) and the following observations were noted (bore logs in **Appendix E**):

- Visual or olfactory evidence of hydrocarbon impacts was not detected at any borehole location, except at BH202M where minor petroleum odour was observed in sand fill;
- Fibre containing substances (FCS), ash, charcoal, asbestos containing material (ACM) or slag were not observed in any of the examined soils; and
- Low PID readings were recorded for the in-field, soil headspace samples (<5ppm), consistent with the non-detection of any suspicious odour in the examined soils at all locations except BH202M.

- At BH202M, PID readings were slightly elevated in sand fill and ranged from 12.7 ppm to 19.1 ppm. The PID reading in underlying clay was 3.4 ppm.

7.3 Groundwater Investigation Results

7.3.1 Monitoring Well Construction

Three groundwater monitoring wells were installed on-site as part of this DSI. Construction details for the installed well are summarised in **Table 7-2**.

Table 7-2 Monitoring Well Construction Details

Well ID	Bore Depth (m BGL)	Screen Interval (m BGL)	Lithology Screened
BH201M	9	6-9	shale
BH202M	9.4	6.4-9.4	shale
BH205M	9	6-9	Silty clay and shale

BH202M was located close to and down gradient of the identified UST area.

7.3.2 Field Observations and Water Test Results

A single GME was conducted on three newly installed wells on 17 November 2020. The associated field measurements are recorded in **Table 7-3** and copies of the completed Field Data Sheets are included in **Appendix E**. Groundwater survey was not conducted during this investigation.

Table 7-3 Groundwater Field Data

Well ID	Stick-up/down (m BGL)	SWL (m BGL)	Purge Volume (L)	DO (mg/L)	pH	EC (µS/cm)	Temp (°C)	Redox[1] (mV)	Turbidity
BH201M	-0.09	2.97	3.0	0.04	6.96	42,060	23.42	183.3	slight to moderate
BH202M	-0.1	3.76	2.5	0.68	7.61	25,794	24.11	239.6	Low
BH205M	0.76	3	3.0	0	6.59	37,632	23.62	329.1	low

Notes:
SWL – Standing Water Level
[1] Field Redox (mV) readings adjusted to Standard Hydrogen Electrode (SHE) by adding field electrode potential (205mV).
DO – Dissolved Oxygen in units of milligrams per litre (mg/L)
EC – groundwater electrical conductivity as measured onsite using portable EC meter
mBGL – metres below ground level (All wells were completed as standpipes with measured stickup/stickdown as shown)
mV – millivolts
L – litres (referring to volume of water purged from the well prior to groundwater sample collection)
Redox – Reduction Potential
µS/cm – micro Siemens per centimetre (EC units)

The field data indicated that the groundwater was slightly acidic at locations BH201M and BH205M and slightly alkaline at location BH202M, saline (EC: 25,794 to 42,060 µS/cm) and oxidising (Redox 183 to 329 mV) but anoxic (DO: 0-0.68 mg/L).

7.4 Laboratory Analytical Results

7.4.1 Soil Analytical Results

A summary of the laboratory results, is presented in **Table 7-4**. More detailed tabulation of the results, showing the tested concentrations for individual samples and comparison against SILs, are presented in **Table T1** at the end of this report (**Appendix B**).

Table 7-4 Summary of Soil Analytical Results

Number of Primary Samples	Analyte	Minimum Concentration (mg/kg)	Maximum Concentration (mg/kg)	Samples Exceeding SILs
Petroleum Hydrocarbons				
20	Benzene	<0.1	<0.1	None
20	Toluene	<0.1	<0.1	None
20	Ethyl benzene	<0.1	<0.1	None
20	Total xylenes	<0.3	<0.3	None
20	Naphthalene	<0.1	<0.1	None
20	F1	<25	<25	None
20	F2	<25	<25	None
20	F3	<90	160	None
20	F4	<120	<120	None
PAHs				
20	Total PAHs	<0.8	22	None
20	Carcinogenic PAHs	<0.3	1.9	None
20	Benzo(a)pyrene	<0.1	1.3	None
OCPs				
12	Total OCPs	<PQL	<PQL	None
OPPs				
12	Total OPPs	<PQL	<PQL	None
Heavy Metal				
20	Arsenic	<1	9	None
20	Cadmium	<0.3	<0.3	None
20	Chromium (Total)	0.7	80	None
20	Copper	2	35	None
20	Lead	3	180	None
20	Mercury	<0.05	0.7	None
20	Nickel	0.9	87	BH209_0.2-0.3 (87 mg/kg, exceedance of EIL)

Number of Primary Samples	Analyte	Minimum Concentration (mg/kg)	Maximum Concentration (mg/kg)	Samples Exceeding SILs
20	Zinc	3	250	BH203_0.1-0.2 (250 mg/kg, exceedance of EIL
PCBs				
12	Total PCBs	<1	<1	None
Asbestos				
12	Asbestos	No asbestos detected	Asbestos detected	BH207_0.2-0.3, BH209_0.2-0.3, BH210_0.2-0.3

7.4.2 Groundwater Analytical Results

Laboratory analytical results for groundwater samples are summarised in **Table 7-5 and Table T2**, the latter presented at the end of this report (**Appendix B**).

Table 7-5 Summary of Groundwater Analytical Results

Number of Primary Samples	Analyte	Minimum Concentration (µg/L)	Maximum Concentration (µg/L)	Samples Exceeding GIL
Metals				
3	Al	10	18	None
3	As	1	3	None
3	Cd	<0.1	0.1	None
3	Cr	<1	120	**BH202M-1**
3	Cu	<1	4	**BH201M-1**
3	Pb	<1	<1	None
3	Hg	<0.1	<0.1	None
3	Ni	5	13	**BH205M-1**
3	Zn	17	63	**BH201M-1, BH202M-1, BH205M-1**
PAHs				
3	Total PAHs	<1	2	None
3	Benzo(α)pyrene	<0.1	<0.1	None
3	2-methylnaphthalene	<0.1	0.3	None
3	1-methylnaphthalene	<0.1	0.2	None
3	Acenaphthylene	<0.1	<0.1	None
3	Acenaphthene	<0.1	0.9	None
3	Phenanthrene	<0.1	0.1	None
3	Naphthalene	<0.1	0.2	None
BTEX				

Number of Primary Samples	Analyte	Minimum Concentration (µg/L)	Maximum Concentration (µg/L)	Samples Exceeding GIL
3	Benzene	<0.5	1	None
3	Toluene	<0.5	<0.5	None
3	Ethylbenzene	<0.5	0.7	None
3	o-xylene	<0.5	1.1	None
3	m/p-xylene	<1	2	None
TRHs				
3	F1	<50	<50	None
3	F2	<60	<60	None
3	F3	<500	<500	None
3	F4	<500	<500	None
Phenols				
3	Phenols	<10	10	None
VOCs				
3	Naphthalene	<0.5	0.6	None
3	Carbon disulfide	<2	2	None
3	Chloroform (THM)	<0.5	2.1	None
3	Bromodichloromethane (THM)	<0.5	2.5	None
3	MIBK (4-methyl-2-pentanone)	<5	36	None
3	Total VOCs	<10	39	None

8. Site Characterisation

8.1 Review of Conceptual Site Model

On the basis of the investigation findings, the CSM discussed in **Section 4** was considered to appropriately identify contamination sources, migration mechanisms and exposure pathways, as well as potential on-site and off-site receptors.

8.2 Soil Characterisation

The general site lithology was described as:

- Silty clay and sandy clay fill to a maximum depth of 1m BGL. Sand fill at BH202M to a maximum depth of 3.5m BGL; overlying
- Natural, residual silty clay (which extended to at least 8m BGL); overlying
- Bedrock, shale; pale brown, moderately weathered, no odour.

Laboratory Results

Petroleum hydrocarbons

- No BTEX was detected in any fill or natural soil sample. Adopted SILs were not exceeded
- No naphthalene was detected in any fill or natural soil sample. The adopted SIL was not exceeded
- No petroleum hydrocarbons (as TRHs) were detected in any fill or natural soil sample except for a minor concentration of TRH-F3 in fill at location BH210.

PAHs

- Carcinogenic PAHs were reported at low concentration in fill at BH203, BH206, BH208 and BH210. The adopted health based SIL was not exceeded.
- Benzo(a)pyrene (B(a)P) was reported at low concentration in fill at BH203, BH206, BH208 and BH210. The adopted ecological SIL was not exceeded

Metals

- Concentrations of metals in fill and natural soil were low.
- No health based SIL was exceeded
- Zinc exceeded the adopted EIL in fill at BH202. Nickel exceeded adopted EIL in fill at BH209. The exceedances were marginal.

Asbestos

- Asbestos was detected in shallow fill in samples BH207_0.2-0.3, BH209_0.2-0.3 and BH201_0.2-0.3.

Other COPCs

- No OCPs, OPPs or PCBs were detected in any fill or natural soil sample.

8.3 Groundwater Characterisation

Three groundwater monitoring wells (BH201M, BH202M and BH205M) were installed in accessible locations at the site during the DSI (**Figure 2** and **Appendix A**). Based on the GME data:

- The SWL was 2.97 to 3.76 m BGL, suggesting that excavation for the proposed four-level basement (i.e. to 12-13m BGL) would intercept the local groundwater table; and
- The field data indicated that the groundwater was near neutral, saline and oxidising.,

Laboratory Results

Petroleum hydrocarbons

- Benzene was reported at low concentration in groundwater at BH202M. The adopted health based SIL was not exceeded. Xylenes were also reported at low concentration.
- Ethylbenzene and xylenes were reported at low concentration at BH201M.
- No BTEX compounds were detected at BH203M.
- Naphthalene was reported at low concentration at BH201M. No naphthalene was reported at BH202M or BH205M.
- No petroleum hydrocarbons (as TRHs) were detected in groundwater at any of the three monitoring wells.

PAHs

- PAHs were reported at low concentration in groundwater at BH202M.
- No reported concentrations of individual PAHs including B(a)P exceeded adopted GILs in any monitoring well.

Metals

- Chromium (total) was reported at a concentration of 120 ug/L at BH202M, which exceeded the adopted GIL for chromium as Cr (VI).
- Copper marginally exceed adopted GIL at BH201M.
- Nickel marginally exceed adopted GIL at BH205M.
- Zinc was reported in a range of 17 ug/L to 63 ug/L and exceeded adopted GIL in all wells.
- No other metals assessed in groundwater exceeded adopted GILs.

Other

- Total phenols were reported in groundwater at BH201M (10 ug/L). The adopted GILs were not exceeded.
- THMs were reported low concentration in BH202M. The adopted GIL was not exceeded.
- MIBK was reported in groundwater at BH102M.

Petroleum hydrocarbons and PAHs were reported at low concentration in groundwater at the site. This indicates that impact to groundwater from previous use as a service station has been negligible.

Elevated concentrations of chromium, copper and zinc were reported in groundwater. The concentration of metals in fill is low and fill is generally shallow and overlies natural clay. It is unlikely that the site is contributing to concentrations of metals reported in groundwater. The primary sources for the identified elevated heavy metal in groundwater are unknown. However, whilst the reported concentrations exceed the ANZG (2018) criteria, it is likely that the reported concentrations in groundwater represent regional groundwater quality. However, further investigation of groundwater for metals, particularly chromium, is warranted.

9. CONCLUSION

The site located at 28 Elizabeth Street, Liverpool NSW was the subject of a detailed site investigation, conducted in order to establish the nature and degree of any on-site contamination, in order to assess suitability for proposed development equivalent to a land use setting of residential with minimal opportunities for soil access.

The key findings of this DSI were as follows:

- The Site was previously used as a service station and a car park;
- The site and neighbouring properties were free of statutory notices and licensing agreements issued under the *Contaminated Land Management Act 1997* and *List of NSW Contaminated Sites Notified to the EPA*. The site was not included on the *Protection of the Environment Operations Act 1997*;
- At the time of site inspection all surface structures have been removed from the site. The site was partially paved at grade (ground level) with concrete hardstand, and unpaved areas were overgrown with weeds and grass;
- Some surface oil staining was observed within the western area of the Site;
- No ACM was observed at the surface across the site. However, fragments of potential ACM and a damaged Telstra pit were observed in a previous inspection (2 April 2019);
- Four USTs were located in situ by GPR survey at the northern area of the site near Elizabeth Street. Field inspection also identified UST fill points and bowser footings. One UST was located by GPR survey adjacent east of the former building. This indicates UPSS infrastructure remains in place;
- Intrusive investigation of soil was undertaken at 12 locations. Monitoring wells were constructed at three of these locations.
- The sub-surface comprised a layer of silty clay and sandy clay fill to 1.0m BGL, overlying natural residual clays, then weathered shale bedrock. Sand fill, to a depth of 3.5 m BGL, was identified at location BH202M located near the UST area;
- Standing water levels of groundwater ranged between 2.97 and 3.76 m BGL;
- Hydrocarbon odour was identified in sand fill at location BH202M near the UST area
- Laboratory analytical results for the representative soil samples all complied with the adopted SILs, except for:
  - The heavy metals nickel (87 mg/kg) in sample BH209_0.2-0.3 and zinc (250 mg/kg) in sample BH203_0.1-0.2 were above ecological based criteria; and
  - Asbestos was detected in shallow fill in samples BH207_0.2-0.3, BH209_0.2-0.3 and BH201_0.2-0.3.
- Laboratory analytical results for the groundwater samples all complied with the adopted GILs, except for:
  - Chromium in BH202M (120 µg/L);
  - Copper in BH201M (120 µg/L);
  - Nickel in BH205M (13 µg/L); and
  - Zinc in BH201M (17 µg/L), BH202M (51 µg/L), and BH205M (63 µg/L).

- Petroleum hydrocarbons and PAHs were either non-detected or reported at low concentration in soil and groundwater at the site. This indicates that impact to soil and groundwater from previous use as a service station has been negligible.

The primary sources for the identified elevated heavy metal in groundwater are currently unknown. It is expected that the reported concentrations in groundwater are likely to be indicative of regional groundwater quality.

Based on the findings from this soil and groundwater field investigation which was conducted in accordance with the investigation scope agreed with the Client, and with consideration of the Statement of Limitations (**Section 11**), EI conclude that widespread contamination was not identified on the Site.

In view of the proposed development scope, and currently available information, EI consider that the Site can be made suitable for the proposed land use equivalent to a setting of residential with minimal opportunities for soil access, provided recommendations detailed in **Section 10** are implemented.

10. RECOMMENDATIONS

Based on the findings of this investigation, EI provides the following recommendations:

- Preparation and implementation of a Remedial Action Plan (RAP), which should:
  - Provide a sampling and quality plan (SAQP) for the assessment and validation of remediation activities to be performed on-site.
  - Complete one round of groundwater monitoring from existing wells to confirm the concentration of metals, particularly chromium.
  - Assess the lateral extent of asbestos impact reported in shallow fill at locations BH207, BH209 and BH210, and at the Telstra pits after removal of concrete slab and services across the Site.
  - Allow for the removal and offsite disposal of all UPSS, associated infrastructure and hydrocarbon impacted soils according to EPA (2014) Technical Note: Investigation of Service Station Sites;
  - Provide requirements for validation sampling following remediation of the UPSS area, surface oil staining area, and asbestos impacted areas identified at the site;
  - Provide an unexpected finds protocol;
  - Provide the requirements and procedures for waste classification assessment including further sampling, in order to enable classification of soils to be excavated and disposed off-site during the proposed basement excavation, in accordance with the EPA (2014) *Waste Classification Guidelines*.
- Undertake remediation and validation works for the site, as outlined in the RAP.
- Any material being imported to the Site (i.e. for landscaping or levelling purposes) should be assessed for potential contamination in accordance with NSW EPA guidelines as being suitable for the intended use or be classified as VENM; and
- Preparation of a final Site Validation Report certifying Site suitability of soils and groundwater for the proposed land use.

11. STATEMENT OF LIMITATIONS

This report has been prepared for the exclusive use of Altis Property Partners Pty Ltd, whom is the only intended beneficiary of EI's work. The scope of the investigation carried out for the purpose of this report was limited to that agreed with Altis Property Partners Pty Ltd.

No other party should rely on this document without the prior written consent of EI, and EI undertakes no duty, or accepts any responsibility or liability, to any third party who purports to rely upon this document without EI's approval.

The findings presented in this report are the result of discrete and specific sampling methodologies used in accordance with best industry practices and standards. Due to the site-specific nature of soil sampling from point locations, it is considered likely that all variations in subsurface conditions across a site cannot be fully defined, no matter how comprehensive the field program.

While normal assessments of data reliability have been made, EI assumes no responsibility or liability for errors in any data obtained from previous assessments conducted on site, regulatory agencies (e.g. Council, EPA), statements from sources outside of EI, or developments resulting from situations outside the scope of works of this project.

Despite all reasonable care and diligence, the ground conditions encountered and concentrations of contaminants measured may not be representative of conditions between the locations sampled and investigated. In addition, site characteristics may change at any time in response to variations in natural conditions, chemical reactions and other events (e.g. groundwater movement and or spillages of contaminating substances). These changes may occur subsequent to EI's investigation.

EI's assessment is necessarily based upon the results of the site investigation and the restricted program of surface and subsurface sampling, screening and chemical testing which was set out in the project proposal. Neither EI, nor any other reputable consultant, can provide unqualified warranties nor does EI assume any liability for site conditions not observed or accessible during the time of the investigations.

This report was prepared for Altis Property Partners Pty Ltd and no responsibility is accepted for use of any part of this report in any other context or for any other purpose or by other third parties. This report does not purport to provide legal advice.

This report and associated documents remain the property of EI subject to payment of all fees due for this assessment. The report shall not be reproduced except in full and with prior written permission by EI.

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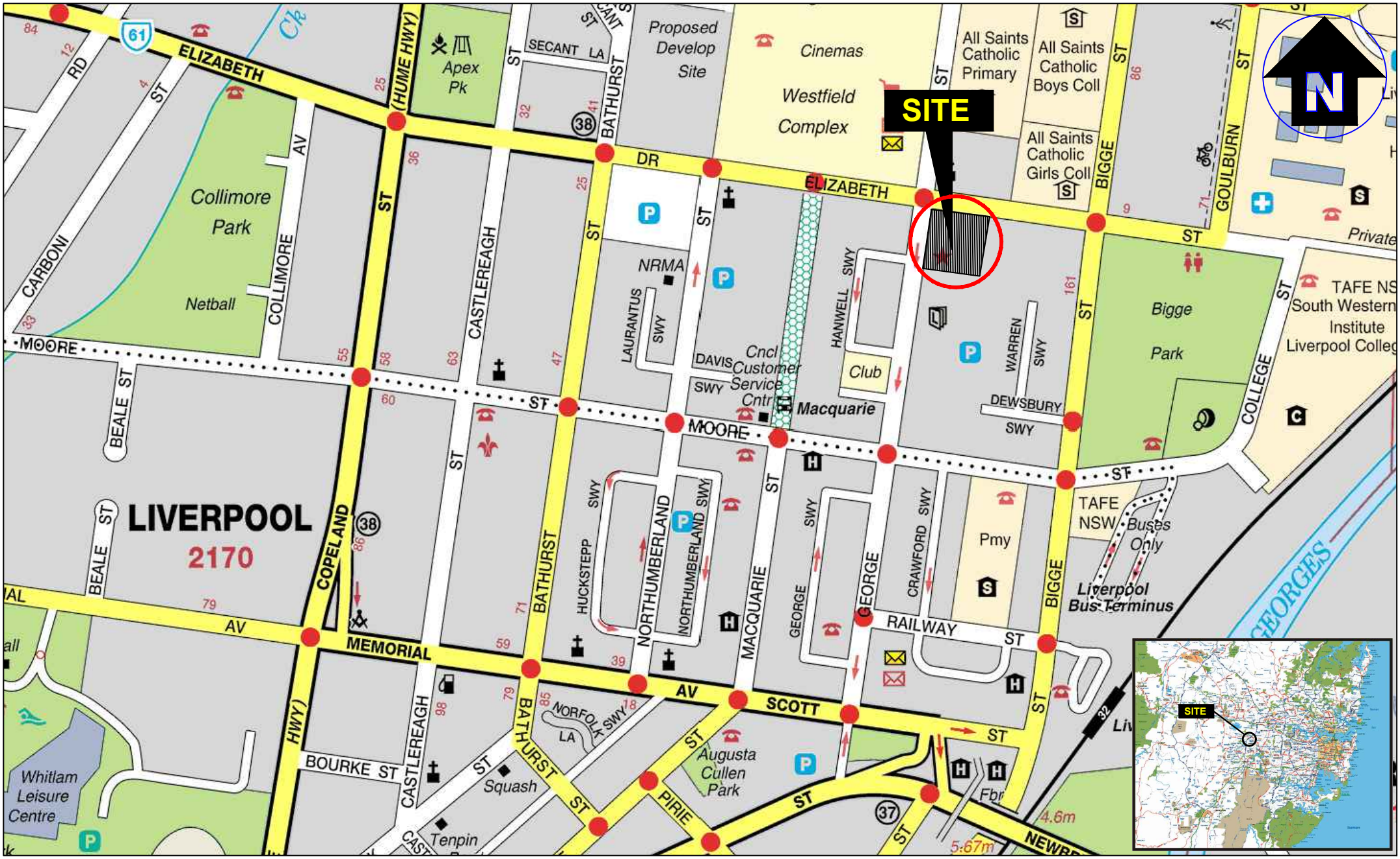
ABBREVIATIONS

ACM	Asbestos-Containing Materials
AHD	Australian Height Datum
ASS	Acid Sulfate Soils
AST	Above-ground Storage Tank
B(α)P	Benzo(α)Pyrene (a PAH compound)
BGL	Below Ground Level
BH	Borehole
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CCO	Chemical Control Order
COC	Chain of Custody
COPC	Contaminants of Potential Concern
CSM	Conceptual Site Model
CVOC	Chlorinated Volatile Organic Compounds (a sub-set of the VOC suite)
DA	Development Application
DBYD	Dial Before You Dig
DCP	Development Control Plan
DP	Deposited Plan
DSI	Detailed Site Investigation
EC	Electrical Conductivity
EI	EI Australia
EIL	Ecological Investigation Level
EMP	Environmental Management Plan
EPA	Environment Protection Authority (of New South Wales)
ESL	Ecological Screening Level
F1	C_6-C_{10} TRH (less the sum of BTEX concentrations)
F2	>C_{10}-C_{16} TRH (less the concentration of naphthalene)
FCS	Fibre Cement Sheeting
GIL	Groundwater Investigation Level
HDPE	High Density Polyethylene
HIL	Health-based Investigation Level
HSL	Health-based Screening Level
km	Kilometres
LEP	Local Environmental Plan
LGA	Local Government Area
LOR	Limit of Reporting (limit of reporting for respective laboratory method)
m	Metres
N/A	Not Applicable
NATA	National Association of Testing Authorities, Australia
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
NSW	New South Wales
OCP	Organochlorine Pesticides
OPP	Organophosphate Pesticides
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
PFAS	Per- and Poly- Fluroalkyl Substances
pH	Potential Hydrogen (a measure of the acidity or basicity of an aqueous solution)
PQL	Practical Quantitation Limit (limit of detection for respective laboratory method)
PSH	Phase-Separated Hydrocarbons
PSI	Preliminary Site Investigation

QA/QC	Quality Assurance / Quality Control
RAP	Remediation Action Plan
RL	Relative Level
SCID	Stored Chemical Information Database (maintained by SafeWork NSW)
SIL	Soil Investigation Level
SOP	Standard Operating Procedure
SRA	Sample Receipt Advice (document confirming laboratory receipt of samples)
SWL	Standing Water Level
TCLP	Toxicity Characteristics Leaching Procedure
TEQ	Toxicity Equivalent Quotient
TPH	Total Petroleum Hydrocarbons (superseded term equivalent to TRH)
TRH	Total Recoverable Hydrocarbons (non-specific analysis of organic compounds)
UCL	Upper Confidence Limit (of the mean)
UPSS	Underground Petroleum Storage System
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VENM	Virgin Excavated Natural Material
VOC	Volatile Organic Compounds (specific organic compounds which are volatile)

Appendix A - Figures



eiaustralia Contamination | Remediation | Geotechnical Suite 6.01, 55 Miller Street, PYRMONT 2009 Ph (02) 9516 0722 Fax (02) 9518 5088	Drawn:	L.C.	**Altis Property Partners Pty Ltd** Detailed Site Investigation 28 Elizabeth Street, Liverpool, NSW Site Locality Plan
	Approved:	A.B.	
	Date:	24-11-20	
	Scale:	Not To Scale	

Figure:
1

Project: E24175.E02

KEY

All soil concentrations are in mg/kg. Colour highlight of exceedance criteria for HIL-B: *medium - high density residential with minimal accessible soils.*
= Exceedance of Human Health Based Criteria
= Exceedance of Ecological Based Criteria

All groundwater concentrations are in µg/L. Colour highlight of exceedance criteria for GILs for Fresh Water environments.
= Exceedance of Ecological Based Criteria

Groundwater Exceedances		BH202M-1
Sampling Date		17-11-20
Chromium	µg/L	120
Zinc	µg/L	51

Groundwater Exceedances		BH201M-1
Sampling Date		17-11-20
Copper	µg/L	4
Zinc	µg/L	17

Soil Exceedances		BH203
Sampling Depth (m BGL)		0.1-0.2
Zinc	mg/kg	250

Soil Exceedances		BH210
Sampling Depth (m BGL)		0.2-0.3
Asbestos	–	Yes

Groundwater Exceedances		BH205M-1
Sampling Date		17-11-20
Nickel	µg/L	13
Zinc	µg/L	63

Soil Exceedances		BH207
Sampling Depth (m BGL)		0.2-0.3
Asbestos	–	Yes

Soil Exceedances		BH209
Sampling Depth (m BGL)		0.2-0.3
Asbestos	-	Yes
Nickel	mg/kg	87.0

ELIZABETH STREET
GEORGE STREET
BH212
BH202M
BH201M
BH211
BH203
BH204
BH210
BH208
BH205M
BH207
BH209
BH206

0 5 10 20 30
Approx. Scale (m)

Map Source: Nearmap, Dated on: 01/10/2020

LEGEND

- Site boundary
- UST farm area identified using GPR Survey
- Borehole location
- Borehole/monitoring well location
- Area with Asbestos
- USTs location (by GPR survey)
- Waste oil UST location
- Broken Telstra pit location
- Location of oil staining

NOTE:Sample locations, features and site boundary are approximate.

eiaustralia
Contamination | Remediation | Geotechnical
Suite 6.01, 55 Miller Street, PYRMONT 2009
Ph (02) 9516 0722 Fax (02) 9518 5088

Drawn:	N.G./ AM.H.
Approved:	G.B.
Date:	7/12/20

Altis Property Partners Pty Ltd
Detailed Site Investigation
28 Elizabeth Street, Liverpool NSW
Sampling Location Plan - Exceedances

Figure: 2

Project: E24175.E02

Appendix B - Tables

Table T1 - All Laboratory Results

				Heavy Metals										PAHs					BTEX				TRH									
Batch Number	Sample Date	Sample ID_Sample Depth	Soil Type	As	Cd	Cr	Cu	Pb	TCLP (Pb) mg/kg	Hg	Ni	TCLP (Ni) mg/kg	Zn	Carcinogenic PAHs (as BaP TEQ)	Benzo(a)pyrene	TCLP (B[a]P) mg/kg	Total PAH	Naphthalene	Benzene	Toluene	Ethylbenzene	Total Xylenes	F1	F2	F3	F4	C_6-C_9	C_{10}-C_{36}	Total OCPs	Total OPPs	Total PCBs	Asbestos detected (yes/no)	Fibre Type
		BH201M_0.5-0.6	Fill	**8**	<0.3	**17.0**	**13**	**16**	N.A.	**0.12**	**4.3**	N.A.	**17**	<0.3	**0.10**	N.A.	**1.30**	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<20	<110	<1	<1.7	<1	No	-
		BH201M_1.2-1.3	Natural	**8**	<0.3	**11.0**	**12**	**11**	N.A.	<0.05	**2.7**	N.A.	**9**	<0.3	<0.1	N.A.	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<20	<110	N.A.	N.A.	N.A.	N.A.	
		BH202M_0.4-0.5	Fill	**2**	<0.3	**2.5**	**2**	**8**	N.A.	<0.05	**1.0**	N.A.	**16**	<0.3	<0.1	N.A.	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<20	<110	<1	<1.7	<1	No	-
		BH202M_2.4-2.5	Fill	N.A.	N.A.	N.A.	N.A.	**3**	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<20	<110	N.A.	N.A.	N.A.	N.A.	
		BH202M_3.9-4.0	Natural	<1	<0.3	**0.7**	**7**	**4**	N.A.	<0.05	**0.9**	N.A.	**3**	<0.3	<0.1	N.A.	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<20	<110	N.A.	N.A.	N.A.	N.A.	
		BH203_0.1-0.2	Fill	**7**	<0.3	**17.0**	**30**	**160**	N.A.	**0.70**	**8.0**	N.A.	**250**	**0.40**	**0.20**	N.A.	**3.00**	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<20	<110	<1	<1.7	<1	No	-
		BH203_0.6-0.7	Natural	**4**	<0.3	**9.6**	**8**	**10**	N.A.	<0.05	**4.6**	N.A.	**7**	<0.3	<0.1	N.A.	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<20	<110	N.A.	N.A.	N.A.	N.A.	
		BH204_0.2-0.3	Fill	**6**	<0.3	**12.0**	**15**	**75**	N.A.	**0.31**	**6.3**	N.A.	**84**	<0.3	<0.1	N.A.	**1.10**	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<20	<110	<1	<1.7	<1	No	-
		BH205M_0.2-0.3	Fill	**7**	<0.3	**17.0**	**6**	**17**	N.A.	<0.05	**3.2**	N.A.	**12**	<0.3	<0.1	N.A.	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<20	<110	<1	<1.7	<1	No	-
		BH205M_1.3-1.4	Natural	**9**	<0.3	**15.0**	**9**	**12**	N.A.	<0.05	**1.6**	N.A.	**11**	<0.3	<0.1	N.A.	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<20	<110	N.A.	N.A.	N.A.	N.A.	
SE213398	9/11/2020	BH206_0.2-0.3	Fill	**6**	<0.3	**13.0**	**14**	**43**	N.A.	**0.20**	**8.3**	N.A.	**58**	**0.80**	**0.50**	N.A.	**6.30**	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<20	<110	<1	<1.7	<1	No	-
		BH206_0.6-0.7	Natural	**4**	<0.3	**11.0**	**7**	**9**	N.A.	<0.05	**3.4**	N.A.	**9**	<0.3	<0.1	N.A.	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<20	<110	N.A.	N.A.	N.A.	N.A.	
		BH207_0.2-0.3	Fill	**4**	<0.3	**8.7**	**10**	**49**	N.A.	**0.28**	**3.9**	N.A.	**42**	<0.3	<0.1	N.A.	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<20	<110	<1	<1.7	<1	**Yes**	Amosite and Chrysotile Asbestos found in approx 10x6x3mm cement sheet fragments
		BH207_0.9-1.0	Natural	**7**	<0.3	**10.0**	**8**	**10**	N.A.	<0.05	**0.9**	N.A.	**7**	<0.3	<0.1	N.A.	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<20	<110	N.A.	N.A.	N.A.	N.A.	
		BH208_0.2-0.3	Fill	**6**	<0.3	**14.0**	**28**	**170**	**<0.02**	**0.29**	**7.7**	N.A.	**170**	**1.20**	**0.80**	**<0.0001**	**10.00**	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<20	<110	<1	<1.7	<1	No	
		BH209_0.2-0.3	Fill	**8**	<0.3	**80.0**	**29**	**24**	N.A.	**0.05**	**87.0**	**0.047**	**94**	<0.3	<0.1	N.A.	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<20	<110	<1	<1.7	<1	**Yes**	Chrysotile Asbestos found in approx 10x5x3mm cement sheet fragment
		BH210_0.2-0.3	Fill	**6**	<0.3	**14.0**	**35**	**180**	**0.08**	**0.32**	**8.1**	N.A.	**240**	**1.90**	**1.30**	**<0.0001**	**22.00**	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	**160**	<120	<20	**180**	<1	<1.7	<1	**Yes**	Chrysotile Asbestos found in approx 25x10x4mm cement sheet fragments
		BH211_0.2-0.3	Fill	**4**	<0.3	**5.3**	**5**	**41**	N.A.	**0.10**	**3.1**	N.A.	**65**	<0.3	<0.1	N.A.	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<20	<110	<1	<1.7	<1	No	-
		BH211_0.8-0.9	Natural	**4**	<0.3	**12.0**	**9**	**8**	N.A.	<0.05	**2.7**	N.A.	**11**	<0.3	<0.1	N.A.	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<20	<110	N.A.	N.A.	N.A.	N.A.	
		BH212_0.2-0.3	Fill	**5**	<0.3	**9.0**	**8**	**25**	N.A.	**0.05**	**4.5**	N.A.	**20**	<0.3	<0.1	N.A.	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<20	<110	<1	<1.7	<1	No	-
		QD1	Fill	**4**	<0.3	**15.0**	**10**	**13**	N.A.	<0.05	**3.0**	N.A.	**11**	N.A.	N.A.	N.A.	N.A.	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<20	<110	N.A.	N.A.	N.A.	N.A.	
Stats		Maximum Concentration (mg/kg)		**9**	<0.3	**80**	**35**	**180**	**<0.02**	**0.70**	**87**	**0.047**	**250**	**1.90**	**1.30**	**<0.0001**	**22.0**	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	**160**	<120	<20	**180**	<1	<1.7	<1	**Yes**	N.A.
		95% UCL		N.A.	N.A.	N.A.	N.A.	**111.8**	N.A.	N.A.	**74.51**	N.A.	**124.8**	N.A.	**0.783**	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
SILs																																
HIL B - *Residential*				500	150	500 CrVI	30,000	1,200		120	1200		60,000	4.00			400												600		1		
HIL D - *Commercial / Industrial*				3,000	900	3,600 CrVI	240,000	1,500		730	6000		400,000	40			4000												3,600		7		
HSL A & HSL B - *Residential* Soil texture classification –Sand [1]				Source depths (0 m to <1 m. BGL)														3.00	0.5	160	55	40	45	110									
				Source depths (1 m to <2 m. BGL)														NL	0.5	220	NL	60	70	240									
				Source depths (2m to <4m. BGL)														NL	0.5	310	NL	95	110	440									
				Source depths (4 m+)														NL	0.5	540	NL	120	200	NL									
HSL D - *Commercial / Industrial* Soil texture classification –Sand [1]				Source depths (0 m to <1 m. BGL)														NL	3	NL	NL	230	260	NL									
				Source depths (1 m to <2 m. BGL)														NL	3	NL	NL	NL	370	NL									
				Source depths (2m to <4 m. BGL)														NL	3	NL	NL	NL	630	NL									
				Source depths (4 m+)														NL	3	NL	NL	NL	NL	NL									
EIL/ESL - Residential [3,4]				100		200	110	1,100			35		250		33 [5]			170	50	85	70	105	180	120	300	2800							
Management Limits – *Residential, parkland and public open space* Coarse grained soil texture[1]																							700	1,000	3,500	10,000						
Asbestos contamination HSL – B Residential with minimal soil access Bonded ACM (%w/w)																																
Asbestos contamination HSL – D *Commercial / Industrial* Bonded ACM (%w/w)																																
Asbestos contamination HSL for Non Bonded / Friable Asbestos (%w/w)																																
Waste Classification Criteria																																
NSW EPA 2014 [2]				100	20	100		100		4	40				0.80	200		10	288	600	1,000							650	10,000	<50		If detected material is Special Waste - Asbestos Waste
General Solid Waste				5.0 / 500	1.0 / 100	5 / 1,900		5 / 1,500		0.2 / 50	2 / 1,050				0.04 / 10	NA / 200		0.5 / 18	14.4 / 518	30 / 1,080	50 / 1,800							NR / 650	NR / 10,000	NR / <50		
NSW EPA 2014 [2]				400	80	400		400		16	160.0				3.20	800		40	1,152	2,400	4,000							2,600	40,000	NR / <50		
Restricted Solid Waste				20 / 2,000	4 / 400	20 / 7,600		20 / 6,000		0.8 / 200	8 / 4,200				0.16 / 23	NA / 800		2 / 72	57.6 / 2,073	120 / 4,320	200 / 7,200							NA / 2,600	NA / 40,000	NR / <50		

Notes: All results are recorded in mg/kg (unless otherwise stated)

Exceeds EILs/ESLs criteria
Exceeds adopted HILs/HSL and NSW EPA Waste Criteria for General Solid Waste CT1
Criteria Exceeded
NSW EPA Waste Criteria met

- the sample was not analysed for the indicated parameter.
1 Coarse Grained soil texture values were applied, being the most conservative of the material types.
2 NSW EPA 2014 (Addendum October 2016) General Solid Waste Tresholds, in Waste Classification Guidelines, Table 1 (CT1) and Table 2 (TCLP1/SCC1)
3 NSW EPA 2014 (Addendum October 2016) General Solid Waste Tresholds, in Waste Classification Guidelines, Table 1 (CT2) and Table 2 (TCLP2/SCC2)
4 EIL derivation for Copper, Nickel and Zinc results are based on NEPC Ecological Investigation Level calculation spreadsheet with pH 5 Cation Exchange Capacity : 5 cmolc/kg, state: NSW and traffic volume: high.
5 CRC CARE 2017, Risk-based management and remediation guidance for benzo(a)pyrene, CRC CARE Technical Report no. 39, CRC for Contamination Assessment and Remediation of the Environment, Newcastle, Australia.
AMO Amosite
CRY Chrysotile
CRO Crocidolite
HIL B NEPC 1999 Amendment 2013 'HIL B' Health Based Investigation Levels applicable for residential exposure settings with minimal opportunities for soil access.
HIL D NEPC 1999 Amendment 2013 'HIL D' Health Based Investigation Levels applicable for commercial/industrial exposure settings.
HSL A & B NEPC 1999 Amendment 2013 'HSL A&B' Health Based Screening Levels based on vapour intrusion values applicable for low-medium density residential sites.
HSL D NEPC 1999 Amendment 2013 'HSL D' Health Based Screening Levels based on vapour intrusion values applicable for commercial / industrial sites.
F1 TRH C6-C10 less BTEX.
F2 TRH >C10-C16 less naphthalene.
F3 TRH >C16-C34.
F4 TRH >C34-C40.
N.A. Not Analysed
NL 'Not Limiting' - The contaminant cannot exceed the maximum allowable vapour risk due to its specific chemical solubility limit.
NR No Reference. i.e. No published criteria available

Table T1 - Groundwater Analytical Data **E24175.E02 - Liverpool**

Sample Identification	Date	Metals									PAHs								BTEX					TRHs				VOCs						Other	
		Al	As	Cd	Cr	Cu	Pb	Ni	Zn	Hg	Naphthalene	2-methylnaphthalene	1-methylnaphthalene	Acenaphthylene	Acenaphthene	Phenanthrene	Benzo(a)pyrene	Total PAH[7]	Benzene	Toluene	Ethylbenzene	o-xylene	m + p-xylene	F1	F2	F3	F4	Naphthalene	Carbon disulfide	Chloroform (THM)	Bromodichloromethane (THM)	MIBK (4-methyl-2-pentanone)	Total VOCs [7]	Total Phenols	pH
Groundwater Investigation (EI, 2020)																																			
BH201M-1	17/11/2020	**18**	**1**	<0.1	<1	**4**	<1	**7**	**17**	<0.1	**0.2**	**0.3**	**0.2**	<0.1	<0.1	**0.1**	<0.1	<1	<0.5	<0.5	**0.7**	**0.5**	**1**	<50	<60	<500	<500	**0.6**	<2	**2.1**	<0.5	**36**	**39**	**10**	**6.96**
BH202M-1		**17**	**1**	<0.1	**120**	**1**	<1	**5**	**51**	<0.1	<0.1	<0.1	0.2	<0.1	**0.9**	**0.1**	<0.1	**2**	**1.0**	<0.5	<0.5	**1.1**	**2**	<50	<60	<500	<500	<0.5	**2**	<0.5	**2.5**	<5	**27**	<10	**7.61**
BH205M-1		**10**	**3**	**0.1**	<1	<1	<1	**13**	**63**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.5	<0.5	<0.5	<0.5	<1	<50	<60	<500	<500	<0.5	<2	<0.5	<0.5	<5	<10	<10	**6.59**
BH200_GWQD1		N.A.	**3**	**0.1**	<1	<1	<1	**13**	**54**	<0.1	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	<0.5	<0.5	<0.5	<0.5	<1	<50	<60	<500	<500	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Maximum		18	3	0.1	120	4	<1	13	63	<0.1	0.2	0.3	0.2	<0.1	0.9	0.1	<0.1	2	1.0	<0.5	0.7	1.1	2	<50	<60	<500	<500	0.6	2.0	2.1	2.5	36.0	39.0	10	8
Minimum		10	1	<0.1	<1	<1	<1	5	17	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.5	<0.5	<0.5	<0.5	<1	<50	<60	<500	<500	<0.5	<2	<0.5	<0.5	<5	<10	**10**	7
Guidelines																																			
HSL D [1] *Commercial/Industrial*																			3	NL	NL	NL		NL	NL											
ANZG (2018)	**Marine Water [2]**			5.5	27.4 (CrIII) [4] 4.4 (CrVI)	1.3	4.4	70	15	0.4	70					0.6 [5]	0.1 [5]		700	180	5	350	275	50 [6]	60 [6]	500 [6]	500 [6]			370			400	7.0-8.5
	Fresh Water [2]	55	24 (As III) 13 (As V)	0.2	3.3 (CrIII) [4] 0.4 (CrVI)	1.4	3.4	11	8	0.6	16								950		80							20	370			320	6.5-8.5
NMHRC (2011) [3]	**Drinking Water [3a]**	2,000*	10	2	50 [4]	1,000 *	10	20	3,000*	1							0.01		1	25*	3*	20 *	20 *							250				6.5-8.5
	Recreational Water [3b]	2,000*	100	20	500 [4]	1,000 *	100	200	3,000*	10							0.1		10	25*	3*	20 *	20 *							2,500				

Notes:

All values are µg/L unless stated otherwise

F1 C6-C10 minus BTEX

F2 >C10-C16 minus naphthalene

F3 (>C16-C34)

F4 (>C34-C40)

NA = 'Not Analysed' i.e. the sample was not analysed.

PAH = Polycyclic Aromatic Hydrocarbons

TRH = Total Recoverable Hydrocarbons

[1] Based on NEPM (2013) Groundwater Health Screening Values for vapour intrusion - Table 1A(4) - Sand, for 4m+

[2] Groundwater Investigation Levels for fresh, marine, based on ANZG (2018) Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT, Australia, August 2018

[3] Based on NHMRC (2011 - update August 2018 v.3.5) Drinking Water Guidelines. The lowest of the Health Guideline or the Aesthetic Guideline has been chosen as the assessment criteria. Aesthetic based criteria have been indicated by *

[3a] The lowest of the Health Guideline or the Aesthetic Guideline has been chosen as the assessment criteria. Aesthetic based criteria have been indicated by *

[3b] The lowest of the Health Guideline x10 or the Aesthetic Guideline has been chosen as the assessment criteria. Aesthetic based criteria have been indicated by *

[4] If site history indicates potential for presence of Cr(VI) - then use 4.4 (marine), 0.4 (freshwater), 50 (drinking water NHRMC), 500 (rec water NHRMC)

[5] To account for the bioaccumulating nature of this toxicant, the 99% species protection level DGV is used for slightly to moderately disturbed systems.

[6] In lack of a criteria the laboratory PQL has been used (DEC, 2007).

[7] Where value is <PQL, it indicates all other tested analytes were below PQL.

Highlighted indicates ecological criteria exceeded

Highlighted indicates recreational water criteria exceeded

Highlighted indicates criteria exceeded

Table B-3 Summary of QA/QC Results for Soil Investigation Samples

Site: 28 Elizabeth Street, Liverpool
Job No: E24175

Date	Sample Identification	Description	TRH				BTEX				Heavy Metals							
			F1	F2	F3	F4	Benzene	Toluene	Ethylbenzene	Xylene (total)	Arsenic	Cadmium	Chromium (Total)	Copper	Lead	Mercury	Nickel	Zinc
Intra-laboratory Duplicate																		
9-Nov-20	BH201M_0.5-0.6	Primary Soil Sample	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	8	<0.3	17	13	16	0.12	4.3	17
9-Nov-20	QD1	Intra-laboratory Duplicate	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	4	<0.3	15	9.6	13	<0.05	3	11
RPD			*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	66.67	*0.00*	*12.50*	*30.09*	*20.69*	96.55	*35.62*	*42.86*
Inter-laboratory Duplicate																		
9-Nov-20	BH101_0.1-0.2	Primary Soil Sample	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	<1	<0.3	2.4	15	47	0.28	1.1	71
9-Nov-20	QT1	Inter-laboratory Duplicate	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<4	<0.4	3	25	73	0.3	2	150
RPD			*0.00*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*22.22*	*50.00*	*43.33*	*6.90*	58.06	71.49
Trip Blanks																		
9-Nov-20	QTB1	Trip Blank	-	-	-	-	<0.1	<0.1	<0.1	<0.3	-	-	-	-	-	-	-	-
Rinsate Blanks																		
9-Nov-20	QR1	De-ionised Water	<50	<60	<500	<500	<0.5	<0.5	<0.5	<1.5	<1	<0.1	<1	<1	<1	<0.1	<1	<5

52.17	Indicates values where a single result is found to be less than detection, with the duplicate sample found to be over the detection limit.
82.35	RPD exceeds 30-50% range referenced from AS4482.1 (2005)

NOTE: All soil results are reported in mg/kg . All water results are reported in µg/L.

F1 = TRH C6-C10 less the sum of BTEX
F2 = TRH >C10-C16 less naphthalene
F3 = TRH >C16-C34
F2 = TRH >C34-C40

[1] Value shown is the lowest recovery value reported for xylenes

Table B-4 Summary of QA/QC Results for Groundwater Samples

Site: 28 Elizabeth Street, Liverpool
Job No: E24175

Date	Sample Identification	Description	TRH				BTEX				Heavy Metals							
			F1	F2	F3	F4	Benzene	Toluene	Ethylbenzene	Xylene (total)	Arsenic	Cadmium	Chromium (Total)	Copper	Lead	Mercury	Nickel	Zinc
Intra-laboratory Duplicate																		
17/11/2020	BH205M-1	Primary Groundwater Sample	<50	<60	<500	<500	<0.5	<0.5	<0.5	<1.5	3	0.1	<1	<1	<1	<0.1	13	63
17/11/2020	BH200_GWQD1	Intra-laboratory Duplicate	<50	<60	<500	<500	<0.5	<0.5	<0.5	<1.5	3	0.1	<1	<1	<1	<0.1	13	54
RPD			*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*15.38*
Inter-laboratory Duplicate																		
17/11/2020	BH205M-1	Primary Groundwater Sample	<50	<60	<500	<500	<0.5	<0.5	<0.5	<1.5	3	0.1	<1	<1	<1	<0.1	13	63
17/11/2020	BH200_GWQT1	Inter-laboratory Duplicate	<10	<50	<100	<100	<1	<1	<1	<3	4	0.1	<1	<1	<1	<0.05	15	80
RPD			*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*28.57*	*0.00*	*0.00*	*0.00*	*0.00*	*NA*	*14.29*	*23.78*
Trip Blanks																		
17/11/2020	GWQTB1	Trip Blank	-	-	-	-	<0.5	<0.5	<0.5	<1.5	-	-	-	-	-	-	-	-
17/11/2020	GWQTS1	Trip Spike	-	-	-	-	[102%]	[102%]	[102%]	[100%]	-	-	-	-	-	-	-	-
Rinsate Blanks																		
17/11/2020	GWQR1	De-ionised Water	<50	<60	<500	<500	<0.5	<0.5	<0.5	<1.5	<1	<0.1	<1	<1	<1	<0.1	<1	<5

52.17 Indicates values where a single result is found to be less than detection, with the duplicate sample found to be over the detection limit.
82.35 RPD exceeds 30-50% range referenced from AS4482.1 (2005)

NOTE: All water results are reported in µg/L.

F1 = TRH C6-C10 less the sum of BTEX
F2 = TRH >C10-C16 less naphthalene
F3 = TRH >C16-C34
F2 = TRH >C34-C40
[1] Value shown is the lowest recovery value reported for xylenes

Appendix C – Site Photographs

Photograph 1: General site condition (9/11/2020).

Photograph 2: Oil stain within the south-east corner of the site (9/11/2020).

Photograph 3: UST area north part of site near Elizabeth Street (9/11/2020).

Appendix D – Borehole Logs

BOREHOLE: BH201M

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Project	Detailed Site Investigation			Sheet	1 OF 1
Location	28 Elizabeth Street, Liverpool NSW			Date Started	9/11/20
Position	Refer to Figure 2			Date Completed	9/11/20
Job No.	E24175.E02	Contractor	Geosense Drilling Pty Ltd	Logged	SL Date:9/11/20
Client	Altis Property Partners Pty Ltd	Drill Rig	Hanjin DB8	Checked	Date:
		Inclination	-90°		

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	PIEZOMETER DETAILS ID / Static Water Level
AD/T	-	9/11/20 ▽	0	0.20				-	CONCRETE; 200 mm thick.	-	-	BH201M
					BH201M_0.5-0.6 QA/QC PID = 1.9 ppm			-	FILL: Silty CLAY; medium to high plasticity, dark brown, with trace of sub-angular to angular gravels, no odour.	M	-	
			1	0.90	BH201M_1.2-1.3 ES PID = 1 ppm			CI-CH	Silty CLAY; medium to high plasticity, orange mottled red, no odour.			
			2									Grout
			3	3.00					From 3.0 m, red-brown, no odour.	M	-	
			4	4.00					From 4.0 m, pale brown, no odour.			
			5	5.00				-	SHALE; pale brown, moderately weathered, no odour.			Bentonite
			6									uPVC 50 mm Casing
			7							D	-	Sand
			8									uPVC 50 mm Screen
			9	9.00					Borehole Terminated at 9.00 mBGL; Target Depth Reached.			
			10									

This borehole log should be read in conjunction with EI Australia's accompanying standard notes.

BOREHOLE: BH202M

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Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	28 Elizabeth Street, Liverpool NSW			Date Started	9/11/20
Position	Refer to Figure 2			Date Completed	9/11/20
Job No.	E24175.E02	Contractor	Geosense Drilling Pty Ltd	Logged SL	Date:9/11/20
Client	Altis Property Partners Pty Ltd	Drill Rig	Hanjin DB8	Checked	Date:
		Inclination	-90°		

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	PIEZOMETER DETAILS ID / Static Water Level
AD/T	-		0	0.20				-	CONCRETE; 200 mm thick.	-	-	BH202M
					BH202M_0.4-0.5 ES PID = 12.7 ppm			-	FILL: SAND; fine grained, dark grey, with slight hydrocarbon odour.			
			1		BH202M_0.9-1.0 ES PID = 10.2 ppm							
					BH202M_1.4-1.5 ES PID = 15.4 ppm							
			2		BH202M_1.9-2.0 ES PID = 17.6 ppm					W	-	
					BH202M_2.4-2.5 ES PID = 19.1 ppm							
			3		BH202M_2.9-3.0 ES PID = 14.3 ppm							
				3.50	BH202M_3.4-3.5 ES PID = 18.2 ppm			CI-CH	Silty CLAY; medium to high plasticity, grey, no odour.			
			4		BH202M_3.9-4.0 ES PID = 3.4 ppm					M	-	
				5.00				-	SHALE; pale brown, moderately weathered, no odour.			
NMLC			5									
			6									
			7							M	-	
			8									
			9									
				9.40					Borehole Terminated at 9.40 mBGL; Target Depth Reached.			
			10									

Grout
Bentonite
uPVC 50 mm Casing
Sand
uPVC 50 mm Screen

This borehole log should be read in conjunction with EI Australia's accompanying standard notes.

BOREHOLE: BH203

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Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	28 Elizabeth Street, Liverpool NSW			Date Started	9/11/20
Position	Refer to Figure 2			Date Completed	9/11/20
Job No.	E24175.E02	Contractor	-	Logged SL	Date:9/11/20
Client	Altis Property Partners Pty Ltd	Drill Rig	Hand Auger	Checked	Date:
		Inclination	-90°		

Drilling					Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0					-	ASPHALT; 50 mm thick.	-	-	ASPHALT
HA	-	GWNE			BH203_0.1-0.2 ES PID = 2.4 ppm			-	FILL: Silty CLAY; medium to high plasticity, dark brown, with trace of sub-angular to angular gravels, no odour.	M	-	FILL
				0.50								
				0.70	BH203_0.6-0.7 ES PID = 0.3 ppm			CI-CH	Silty CLAY; medium to high plasticity, orange mottled red, no odour.	M	-	RESIDUAL SOIL
									Borehole Terminated at 0.70 mBGL; Target Depth Reached.			
			1									
			2									
			3									
			4									
			5									
			6									
			7									
			8									
			9									
			10									

This borehole log should be read in conjunction with EI Australia's accompanying standard notes.

BOREHOLE: BH204

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Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	28 Elizabeth Street, Liverpool NSW			Date Started	9/11/20
Position	Refer to Figure 2			Date Completed	9/11/20
Job No.	E24175.E02	Contractor	-	Logged SL	Date:9/11/20
Client	Altis Property Partners Pty Ltd	Drill Rig	Hand Auger	Checked	Date:
		Inclination	-90°		

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0	0.10				-	CONCRETE; 100 mm thick.	-	-	CONCRETE HARDSTAND
HA	-	GWNE			BH204_0.2-0.3 ES PID = 2.4 ppm			-	FILL: Silty CLAY; medium to high plasticity, dark brown, with trace of sub-angular to angular gravels, no odour.	M	-	FILL
				0.60								
				0.80	BH204_0.7-0.8 ES PID = 1.6 ppm			CI-CH	Silty CLAY; medium to high plasticity, orange mottled red, no odour.	M	-	RESIDUAL SOIL
			1						Borehole Terminated at 0.80 mBGL; Target Depth Reached.			
			2									
			3									
			4									
			5									
			6									
			7									
			8									
			9									
			10									

This borehole log should be read in conjunction with EI Australia's accompanying standard notes.

BOREHOLE: BH205M

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Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	28 Elizabeth Street, Liverpool NSW			Date Started	9/11/20
Position	Refer to Figure 2			Date Completed	9/11/20
Job No.	E24175.E02	Contractor	Geosense Drilling Pty Ltd	Logged	SL Date:9/11/20
Client	Altis Property Partners Pty Ltd	Drill Rig	Hanjin DB8	Checked	Date:
		Inclination	-90°		

Drilling					Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	PIEZOMETER DETAILS ID Static Water Level BH205M
AD/T	-	9/11/20	0		BH205M_0.2-0.3 ES PID = 2.7 ppm			-	FILL: Sandy CLAY; low plasticity, brown, with fine grained sand, with sub-angular to angular gravels, no odour.	M	-	BH205M
				1.00	BH205M_0.8-0.9 ES PID = 1.9 ppm			CI-CH	Silty CLAY; medium to high plasticity, red-brown mottled grey, no odour.			
			1		BH205M_1.3-1.4 ES PID = 1.1 ppm							
			2									Grout
			3									
			4							M	-	
			5									Bentonite
			6									uPVC 50 mm Casing
			7									Sand
NDD			8	8.00				-	SHALE; pale brown, moderately weathered, no odour.	M	-	uPVC 50 mm Screen
			9	9.00					Borehole Terminated at 9.00 mBGL; Target Depth Reached.			
			10									

This borehole log should be read in conjunction with EI Australia's accompanying standard notes.

BOREHOLE: BH206

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Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	28 Elizabeth Street, Liverpool NSW			Date Started	9/11/20
Position	Refer to Figure 2			Date Completed	9/11/20
Job No.	E24175.E02	Contractor	-	Logged SL	Date:9/11/20
Client	Altis Property Partners Pty Ltd	Drill Rig	Hand Auger	Checked	Date:
		Inclination	-90°		

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
HA	-	GWNE	0		BH206_0.2-0.3 ES PID = 2.1 ppm			-	FILL: Sandy CLAY; low plasticity, brown, with fine grained sand, with sub-angular to angular gravels, no odour.	M	-	FILL
				0.50								
				0.70	BH206_0.6-0.7 ES PID = 1.2 ppm			CI-CH	Silty CLAY; medium to high plasticity, orange mottled red, no odour.	M	-	RESIDUAL SOIL
			1						Borehole Terminated at 0.70 mBGL; Target Depth Reached.			
			2									
			3									
			4									
			5									
			6									
			7									
			8									
			9									
			10									

This borehole log should be read in conjunction with EI Australia's accompanying standard notes.

BOREHOLE: BH207

eiaustralia
Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	28 Elizabeth Street, Liverpool NSW			Date Started	9/11/20
Position	Refer to Figure 2			Date Completed	9/11/20
Job No.	E24175.E02	Contractor	Geosense Drilling Pty Ltd	Logged	SL Date:9/11/20
Client	Altis Property Partners Pty Ltd	Drill Rig	Hanjin DB8	Checked	Date:
		Inclination	-90°		

Drilling					Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	-	GWNE	0		BH207_0.2-0.3 ES			-	FILL: Sandy CLAY; low plasticity, brown, with fine grained sand, with sub-angular to angular gravels, no odour.	M	-	FILL
				0.60								
	-		1		BH207_0.9-1.0 ES			CI-CH	Silty CLAY; medium to high plasticity, red-brown mottled grey, no odour.	M	-	RESIDUAL SOIL
				1.30					Borehole Terminated at 1.30 mBGL; Target Depth Reached.			
			2									
			3									
			4									
			5									
			6									
			7									
			8									
			9									
			10									

This borehole log should be read in conjunction with EI Australia's accompanying standard notes.

BOREHOLE: BH208

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Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	28 Elizabeth Street, Liverpool NSW			Date Started	9/11/20
Position	Refer to Figure 2			Date Completed	9/11/20
Job No.	E24175.E02	Contractor	Geosense Drilling Pty Ltd	Logged	SL Date:9/11/20
Client	Altis Property Partners Pty Ltd	Drill Rig	Hanjin DB8	Checked	Date:
		Inclination	-90°		

Drilling					Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0	0.10				-	CONCRETE; 100 mm thick.	-	-	CONCRETE HARDSTAND
AD/T	-	GWNE			BH208_0.2-0.3 ES			-	FILL: Sandy CLAY; low plasticity, brown, with fine grained sand, with sub-angular to angular gravels, no odour.	M	-	FILL
				0.60				CI-CH	Silty CLAY; medium to high plasticity, red-brown mottled grey, no odour.			RESIDUAL SOIL
			1		BH208_0.9-1.0 ES					M	-	
				1.30					Borehole Terminated at 1.30 mBGL; Target Depth Reached.			
			2									
			3									
			4									
			5									
			6									
			7									
			8									
			9									
			10									

This borehole log should be read in conjunction with EI Australia's accompanying standard notes.

BOREHOLE: BH209

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Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	28 Elizabeth Street, Liverpool NSW			Date Started	9/11/20
Position	Refer to Figure 2			Date Completed	9/11/20
Job No.	E24175.E02	Contractor	Geosense Drilling Pty Ltd	Logged	SL Date:9/11/20
Client	Altis Property Partners Pty Ltd	Drill Rig	Hanjin DB8	Checked	Date:
		Inclination	-90°		

Drilling					Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	-	GWNE	0		BH209_0.2-0.3 ES			-	FILL: Sandy CLAY; low plasticity, brown, with fine grained sand, with sub-angular to angular gravels, no odour.	M	-	FILL
				0.60								
			1		BH209_0.9-1.0 ES			CI-CH	Silty CLAY; medium to high plasticity, red-brown mottled grey, no odour.	M	-	RESIDUAL SOIL
				1.30					Borehole Terminated at 1.30 mBGL; Target Depth Reached.			
			2									
			3									
			4									
			5									
			6									
			7									
			8									
			9									
			10									

This borehole log should be read in conjunction with EI Australia's accompanying standard notes.

BOREHOLE: BH210

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Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	28 Elizabeth Street, Liverpool NSW			Date Started	9/11/20
Position	Refer to Figure 2			Date Completed	9/11/20
Job No.	E24175.E02	Contractor	Geosense Drilling Pty Ltd	Logged	SL Date:9/11/20
Client	Altis Property Partners Pty Ltd	Drill Rig	Hanjin DB8	Checked	Date:
		Inclination	-90°		

Drilling					Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	-	GWNE	0		BH210_0.2-0.3 ES			-	FILL: Sandy CLAY; low plasticity, brown, with fine grained sand, with sub-angular to angular gravels, no odour.	M	-	FILL
				0.60								
			1		BH210_0.9-1.0 ES			CI-CH	Silty CLAY; medium to high plasticity, red-brown mottled grey, no odour.	M	-	RESIDUAL SOIL
				1.30					Borehole Terminated at 1.30 mBGL; Target Depth Reached.			
			2									
			3									
			4									
			5									
			6									
			7									
			8									
			9									
			10									

This borehole log should be read in conjunction with EI Australia's accompanying standard notes.

BOREHOLE: BH211

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Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	28 Elizabeth Street, Liverpool NSW			Date Started	9/11/20
Position	Refer to Figure 2			Date Completed	9/11/20
Job No.	E24175.E02	Contractor	Geosense Drilling Pty Ltd	Logged	SL Date:9/11/20
Client	Altis Property Partners Pty Ltd	Drill Rig	Hanjin DB8	Checked	Date:
		Inclination	-90°		

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	-	GWNE	0	0.10				-	CONCRETE; 100 mm thick.	-	-	CONCRETE HARDSTAND
					BH211_0.2-0.3 ES PID = 3.1 ppm			S	SAND; fine grained, brown, no odour.	M	-	RESIDUAL SOIL
				0.50				CI-CH	Silty CLAY; medium to high plasticity, orange mottled red, no odour.			
			1		BH211_0.8-0.9 ES PID = 2.4 ppm					M	-	
				1.20					Borehole Terminated at 1.20 mBGL; Target Depth Reached.			
			2									
			3									
			4									
			5									
			6									
			7									
			8									
			9									
			10									

This borehole log should be read in conjunction with EI Australia's accompanying standard notes.

BOREHOLE: BH212

eiaustralia
Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	28 Elizabeth Street, Liverpool NSW			Date Started	9/11/20
Position	Refer to Figure 2			Date Completed	9/11/20
Job No.	E24175.E02	Contractor	Geosense Drilling Pty Ltd	Logged	SL Date:9/11/20
Client	Altis Property Partners Pty Ltd	Drill Rig	Hanjin DB8	Checked	Date:
		Inclination	-90°		

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	-	GWNE	0	0.10				-	CONCRETE; 100 mm thick.	-	-	CONCRETE HARDSTAND
					BH212_0.2-0.3 ES PID = 2.7 ppm			-	FILL: Silty CLAY; medium to high plasticity, dark brown, with trace of sub-angular to angular gravels, no odour.	M	-	FILL
				0.50				-	SHALE; pale brown, moderately weathered, no odour.			BEDROCK
					BH212_0.7-0.8 ES PID = 2.4 ppm					M	-	
			1	1.10					Borehole Terminated at 1.10 mBGL; Target Depth Reached.			
			2									
			3									
			4									
			5									
			6									
			7									
			8									
			9									
			10									

This borehole log should be read in conjunction with EI Australia's accompanying standard notes.

EXPLANATION OF NOTES, ABBREVIATIONS & TERMS USED ON BOREHOLE AND TEST PIT LOGS

DRILLING/EXCAVATION METHOD

HA	Hand Auger	RD	Rotary blade or drag bit	NQ	Diamond Core - 47 mm
DTC	Diatube Coring	RT	Rotary Tricone bit	NMLC	Diamond Core - 52 mm
NDD	Non-destructive digging	RAB	Rotary Air Blast	HQ	Diamond Core - 63 mm
AS*	Auger Screwing	RC	Reverse Circulation	HMLC	Diamond Core - 63mm
AD*	Auger Drilling	PT	Push Tube	BH	Tractor Mounted Backhoe
*V	V-Bit	CT	Cable Tool Rig	EX	Tracked Hydraulic Excavator
*T	TC-Bit, e.g. ADT	JET	Jetting	EE	Existing Excavation
ADH	Hollow Auger	WB	Washbore or Bailer	HAND	Excavated by Hand Methods

PENETRATION/EXCAVATION RESISTANCE

L **Low resistance.** Rapid penetration/ excavation possible with little effort from equipment used.

M **Medium resistance.** Penetration/ excavation possible at an acceptable rate with moderate effort from equipment used.

H **High resistance.** Penetration/ excavation is possible but at a slow rate and requires significant effort from equipment used.

R **Refusal/ Practical Refusal.** No further progress possible without risk of damage or unacceptable wear to equipment used.

These assessments are subjective and are dependent on many factors, including equipment power and weight, condition of excavation or drilling tools and experience of the operator.

WATER

Water level at date shown

Water inflow

Partial water loss

Complete water loss

GROUNDWATER NOT OBSERVED — Observation of groundwater, whether present or not, was not possible due to drilling water, surface seepage or cave-in of the borehole/ test pit.

GROUNDWATER NOT ENCOUNTERED — Borehole/ test pit was dry soon after excavation. However, groundwater could be present in less permeable strata. Inflow may have been observed had the borehole/ test pit been left open for a longer period.

SAMPLING AND TESTING

SPT	Standard Penetration Test to AS1289.6.3.1-2004
4,7,11 N=18	4,7,11 = Blows per 150mm. N = Blows per 300mm penetration following 150mm
seating 30/80mm	Where practical refusal occurs, the blows and penetration for that interval are reported
RW	Penetration occurred under the rod weight only
HW	Penetration occurred under the hammer and rod weight only
HB	Hammer double bouncing on anvil
Sampling	
DS	Disturbed Sample
BDS	Bulk disturbed Sample
GS	Gas Sample
WS	Water Sample
U63	Thin walled tube sample - number indicates nominal sample diameter in millimetres
Testing	
FP	Field Permeability test over section noted
FVS	Field Vane Shear test expressed as uncorrected shear strength (sv = peak value, sr = residual value)
PID	Photoionisation Detector reading in ppm
PM	Pressuremeter test over section noted
PP	Pocket Penetrometer test expressed as instrument reading in kPa
WPT	Water Pressure tests
DCP	Dynamic Cone Penetrometer test
CPT	Static Cone Penetration test
CPTu	Static Cone Penetration test with pore pressure (u) measurement

RANKING OF VISUALLY OBSERVABLE CONTAMINATION AND ODOUR (for specific soil contamination assessment

R = 0	No visible evidence of contamination	R = A	No non-natural odours identified
R = 1	Slight evidence of visible contamination	R = B	Slight non-natural odours identified
R = 2	Visible contamination	R = C	Moderate non-natural odours identified
R = 3	Significant visible contamination	R = D	Strong non-natural odours identified

ROCK CORE RECOVERY

TCR = Total Core Recovery (%)

$$= \frac{\text{Length of core recevered}}{\text{Lengh of core run}} \text{ x } 100$$

SCR = Solid Core Recovery (%)

$$= \frac{\Sigma \text{ Length ofcylindrical core recevered}}{\text{Lengh of core run}} \text{ x } 100$$

RQD = Rock Quality Designation (%)

$$= \frac{\Sigma \text{Axial Lenghts of core} > 100\text{mm}}{\text{Lengh of core run}} \text{ x } 100$$

MATERIAL BOUNDARIES

———— = inferred boundary

- - - - - - - - = probable boundary

— ?— ?— ?— ? = possible boundary

METHOD OF SOIL DESCRIPTION USED ON BOREHOLE AND TEST PIT LOGS

	FILL		ORGANIC SOILS (OL, OH or Pt)		CLAY (CL, CI or CH)
	COUBLES or BOULDERS		SILT (ML or MH)		SAND (SP or SW)
	GRAVEL (GP or GW)	Combinations of these basic symbols may be used to indicate mixed materials such as sandy clay			

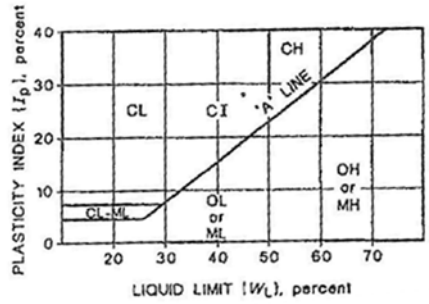
CLASSIFICATION AND INFERRED STRATIGRAPHY

Soil is broadly classified and described in Borehole and Test Pit Logs using the preferred method given in AS1726 – 1993, (Amdt1 – 1994 and Amdt2 – 1994), Appendix A. Material properties are assessed in the field by visual/tactile methods.

PARTICLE SIZE CHARACTERISTICS

Major Division	Sub Division	Particle Size
BOULDERS		>200 mm
COBBLES		63 to 200 mm
GRAVEL	Coarse	20 to 63 mm
	Medium	6 to 20 mm
	Fine	2 to 6 mm
SAND	Coarse	0.6 to 2 mm
	Medium	0.2 to 0.6 mm
	Fine	0.075 to 0.2mm
SILT		0.002 to 0.075 mm
CLAY		<0.002 mm

PLASTICITY PROPERTIES



USCS SYMBOLS

Major Divisions		Symbol	Description
COARSE GRAINED SOILS More than 50% by dry mass less than 63mm is greater than 0.075mm	More than 50% of coarse grains are >2.mm	GW	Well graded gravel and gravel-sand mixtures, little or no fines.
		GP	Poorly graded gravel and gravel-sand mixtures, little or no fines.
		GM	Silty gravel, gravel-sand-silt mixtures.
		GC	Clayey gravel, gravel-sand-clay mixtures.
	More than 50% of coarse grains are <2 mm	SW	Well graded sand and gravelly sand, little or no fines.
		SP	Poorly graded sand and gravelly sand, little or no fines.
		SM	Silty sand, sand-silt mixtures.
		SC	Clayey sand, sandy-clay mixtures.
FINE GRAINED SOILS More than 50% by dry mass less than 63mm is less than 0.075mm	Liquid Limit less < 50%	ML	Inorganic silts of low plasticity, very fine sands, rock flour, silty or clayey fine sands.
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays.
		OL	Organic silts and organic silty clays of low plasticity.
	Liquid Limit > than 50%	MH	Inorganic silts of high plasticity.
		CH	Inorganic clays of high plasticity.
		OH	Organic clays of medium to high plasticity.
		PT	Peat muck and other highly organic soils.

MOISTURE CONDITION

Symbol	Term	Description
D	Dry	Sands and gravels are free flowing. Clays & Silts may be brittle or friable and powdery.
M	Moist	Soils are darker than in the dry condition & may feel cool. Sands and gravels tend to cohere.
W	Wet	Soils exude free water. Sands and gravels tend to cohere.

Moisture content of cohesive soils may also be described in relation to plastic limit (WP) or liquid limit (WL) [» much greater than, > greater than, < less than, « much less than].

CONSISTENCY

Symbol	Term	Undrained Shear Strength
VS	Very Soft	0. to 12 kPa
S	Soft	12 to 25 kPa
F	Firm	25 to 50 kPa
St	Stiff	50 to 100 kPa
VSt	Very Stiff	100 to 200 kPa
H	Hard	Above 200 kPa

DENSITY

Symbol	Term	Density Index %	SPT "N" #
VL	Very Loose	< 15	0 to 4
L	Loose	15 to 35	4 to 10
MD	Medium Density	35 to 65	10 to 30
D	Dense	65 to 85	30 to 50
VD	Very Dense	Above 85	Above 50

In the absence of test results, consistency and density may be assessed from correlations with the observed behaviour of the material.
SPT correlations are not stated in AS1726 – 1993, and may be subject to corrections for overburden pressure and equipment type.

MINOR COMPONENTS

Term	Assessment Guide	Proportion by Mass
Trace	Presence just detectable by feel or eye but soil properties little or no different to general properties of primary component	Coarse grained soils: ≤ 5% Fine grained soil: ≤15%
Some	Presence easily detectable by feel or eye but soil properties little or no different to general properties of primary component	Coarse grained soils: 5 - 12% Fine grained soil: 15 - 30%

TERMS FOR ROCK MATERIAL STRENGTH AND WEATHERING

CLASSIFICATION AND INFERRED STRATIGRAPHY

Soil is broadly classified and described in Borehole and Test Pit Logs using the preferred method given in AS1726 – 1993, (Amdt1 – 1994 and Amdt2 – 1994), Appendix A. Material properties are assessed in the field by visual/ tactile methods.

STRENGTH

Symbol	Term	Point Load Index, $Is_{(50)}$ (MPa) #	Field Guide
EL	Extremely Low	< 0.03	Easily remoulded by hand to a material with soil properties.
VL	Very Low	0.03 to 0.1	Material crumbles under firm blows with sharp end of pick; can be peeled with knife; too hard to cut a triaxial sample by hand. Pieces up to 30 mm can be broken by finger pressure.
L	Low	0.1 to 0.3	Easily scored with a knife; indentations 1 mm to 3 mm show in the specimen with firm blows of pick point; has dull sound under hammer. A piece of core 150 mm long by 50 mm diameter may be broken by hand. Sharp edges of core may be friable and break during handling.
M	Medium	0.3 to 1	Readily scored with a knife; a piece of core 150 mm long by 50 mm diameter can be broken by hand with difficulty.
H	High	1 to 3	A piece of core 150 mm long by 50 mm diameter cannot be broken by hand but can be broken with pick with a single firm blow; rock rings under hammer.
VH	Very High	3 to 10	Hand specimen breaks with pick after more than one blow; rock rings under hammer.
EH	Extremely High	>10	Specimen requires many blows with geological pick to break through intact material; rock rings under hammer.

 # Rock Strength Test Results

▼ Point Load Strength Index, $Is_{(50)}$, Axial test (MPa)

◀ Point Load Strength Index, $Is_{(50)}$, Diametral test (MPa)

Relationship between rock strength test result ($Is_{(50)}$) and unconfined compressive strength (UCS) will vary with rock type and strength, and should be determined on a site-specific basis. UCS is typically 10 to 30 x $Is_{(50)}$, but can be as low as 5 MPa.

ROCK MATERIAL WEATHERING

Symbol		Term	Field Guide
RS		Residual Soil	Soil developed on extremely weathered rock; the mass structure and substance fabric are no longer evident; there is a large change in volume but the soil has not been significantly transported.
EW		Extremely Weathered	Rock is weathered to such an extent that it has soil properties - i.e. it either disintegrates or can be remoulded, in water.
DW	HW	Distinctly Weathered	Rock strength usually changed by weathering. The rock may be highly discoloured, usually by iron staining. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores. In some environments it is convenient to subdivide into Highly Weathered and Moderately Weathered, with the degree of alteration typically less for MW.
	MW		
SW		Slightly Weathered	Rock slightly discoloured but shows little or no change of strength relative to fresh rock.
FR		Fresh	Rock shows no sign of decomposition or staining.

ABBREVIATIONS AND DESCRIPTIONS FOR ROCK MATERIAL AND DEFECTS

CLASSIFICATION AND INFERRED STRATIGRAPHY

Rock is broadly classified and described in Borehole Logs using the preferred method given in AS1726 – 1993, (Amdt1 – 1994 and Amdt2 – 1994), Appendix A. Material properties are assessed in the field by visual/ tactile methods.

ROCK MATERIAL DESCRIPTION

Layering

Term	Description
Massive	No layering apparent
Poorly Developed	Layering just visible; little effect on properties
Well Developed	Layering (bedding, foliation, cleavage) distinct; rock breaks more easily parallel to layering

Structure

Term	Spacing (mm)
Thinly laminated	<6
Laminated	6 – 20
Very thinly bedded	20 – 60
Thinly bedded	60 – 200
Medium bedded	200 – 600
Thickly bedded	600 – 2,000
Very thickly bedded	> 2,000

ABBREVIATIONS AND DESCRIPTIONS FOR DEFECT TYPES

Defect Type	Abbr.	Description
Joint	JT	Surface of a fracture or parting, formed without displacement, across which the rock has little or no tensile strength. May be closed or filled by air, water or soil or rock substance, which acts as cement.
Bedding Parting	BP	Surface of fracture or parting, across which the rock has little or no tensile strength, parallel or sub-parallel to layering/ bedding. Bedding refers to the layering or stratification of a rock, indicating orientation during deposition, resulting in planar anisotropy in the rock material.
Foliation	FL	Repetitive planar structure parallel to the shear direction or perpendicular to the direction of higher pressure, especially in metamorphic rock, e.g. Schistosity (SH) and Gneissosity.
Contact	CO	The surface between two types or ages of rock.
Cleavage	CL	Cleavage planes appear as parallel, closely spaced and planar surfaces resulting from mechanical fracturing of rock through deformation or metamorphism, independent of bedding.
Sheared Seam/ Zone (Fault)	SS/SZ	Seam or zone with roughly parallel almost planar boundaries of rock substance cut by closely spaced (often <50 mm) parallel and usually smooth or slickensided joints or cleavage planes.
Crushed Seam/ Zone (Fault)	CS/CZ	Seam or zone composed of disoriented usually angular fragments of the host rock substance, with roughly parallel near-planar boundaries. The brecciated fragments may be of clay, silt, sand or gravel sizes or mixtures of these.
Decomposed Seam/ Zone	DS/DZ	Seam of soil substance, often with gradational boundaries, formed by weathering of the rock material in places.
Infilled Seam	IS	Seam of soil substance, usually clay or clayey, with very distinct roughly parallel boundaries, formed by soil migrating into joint or open cavity.
Schistocity	SH	The foliation in schist or other coarse grained crystalline rock due to the parallel arrangement of platy or prismatic mineral grains, such as mica.
Vein	VN	Distinct sheet-like body of minerals crystallised within rock through typically open-space filling or crack-seal growth.

ABBREVIATIONS AND DESCRIPTIONS FOR DEFECT SHAPE AND ROUGHNESS

Shape	Abbr.	Description	Roughness	Abbr.	Description
Planar	Pl	Consistent orientation	Polished	Pol	Shiny smooth surface
Curved	Cu	Gradual change in orientation	Slickensided	SL	Grooved or striated surface, usually polished
Undulating	Un	Wavy surface	Smooth	S	Smooth to touch. Few or no surface irregularities
Stepped	St	One or more well defined steps	Rough	RF	Many small surface irregularities (amplitude generally <1mm). Feels like fine to coarse sandpaper
Irregular	Ir	Many sharp changes in orientation	Very Rough	VR	Many large surface irregularities, amplitude generally >1mm. Feels like very coarse sandpaper

Orientation: **Vertical Boreholes –** The dip (inclination from horizontal) of the defect.
Inclined Boreholes – The inclination is measured as the acute angle to the core axis.

ABBREVIATIONS AND DESCRIPTIONS FOR DEFECT COATING

Coating	Abbr.	Description
Clean	CN	No visible coating or infilling
Stain	SN	No visible coating but surfaces are discoloured by staining, often limonite (orange-brown)
Veneer	VNR	A visible coating of soil or mineral substance, usually too thin to measure (< 1 mm); may be patchy

DEFECT APERTURE

Aperture	Abbr.	Description
Closed	CL	Closed.
Open	O	Without any infill material.
Infilled	-	Soil or rock i.e. clay, talc, pyrite, quartz, etc.

Appendix E – Calibration Form, Field Data Sheets and GPR Survey Letter

EI Australia
Suite 6.01, 55 Miller Street
PYRMONT, NSW, 2009

ABN 33 102 449 507
E service@eiaustralia.com.au
W www.eiaustralia.com.au
T 02 9516 0722

CALIBRATION CERTIFICATE FOR PHOTO IONISATION DETECTOR

Instrument: Mini RAE 3000

Serial Number: 592-906667 - EI **PID02** ☐ **OR** 592-901345 - EI **PID03** ☑

Instrument Conditions: good

Calibration gas species: Isobutylene.

Calibration gas concentration: 100 ppm

Gas bottle number: 10748781/102

This PID has been calibrated to Isobutylene gas with the span concentration displayed as

99.6 ppm at 100 ppm span setting (allowable range +/-10ppm from span setting).

The PID is initially zero calibrated in fresh air.

Remaining gas in bottle: 2450 psi (if reading is <250 psi, notify Equipment Manager to arrange new gas bottle order)

The above detector was calibrated in accordance with manufacturer's specifications.

Signed: [signature]

Date: 9/11/22

Time: 7am.

WATER SAMPLING FIELD SHEET

eiaustralia

Site Address:	28 Elizabeth St, Liverpool	Job Number:	E24175
Client:		Date:	17-11-20
Field Staff:	SL	Sampling Location ID	BH202M
Well Location:		Round No:	1

MEDIUM ☑Groundwater ☐Surface Water ☐Stormwater ☐Other:

SAMPLING POINT INFO

Well Installation Date:		Stick up / down (m):	-0.1 (+ above ground - below ground)
Initial Well Depth (mBTOC):		Screen Interval (mBTOC):	
Previous Sampling Date:		Previous SWL (mBTOC):	

PID READINGS

PID Headspace (ppm):		PID Background (ppm):	
PID Breathing Space (ppm):			

PRE PURGE

Total Well Depth (mBTOC):	9.30	Well Head Condition:	good
SWL (mBTOC):	3.66	Water Column (m):	

PHASE SEPARATED HYDROCARBONS (PSH)

Depth to PSH (mBTOC):		PSH Visually Confirmed (Bailer):	
PSH Thickness (mm):			

PURGE AND SAMPLE

Sampling Method ☑Bladder ☐Peristaltic ☐Submersible ☐Other:

Depth of Pump Inlet (mBTOC):	8.0	Fill Timer:	5
Pump Pressure Regulator (psi):	20	Discharge Timer:	10
Weather Conditions:	Sunny	Cycle:	6pmx
Pump on time:	12 PM	Pump off time:	

WATER QUALITY PARAMETERS

Probe Make and Model:	Bump Test Date and Time:

Time	Volume (L)	SWL (mbtoc)	Temp (°C)	EC (µS/cm)	Redox (mV)	DO (mg/L)	pH (units)	Comments (colour, turbidity, odour, sheen etc.)
12:01	0.5	3.69	24.02	26780	40.2	0.4	7.69	pale grey, low, no, no
12:02	1.0	3.71	24.08	27720	30.6	0.58	7.61	
	1.5	3.73	24.10	26730	33.2	0.60	7.60	
	2.0	3.76	24.12	24932	30.1	0.61	7.60	
	4.5	3.81	24.11	25794	34.6	0.68	7.61	
Stabilisation range: 3 consecutive readings			±0.2°C	±3%	±20mV	±10%	±0.2	

OTHER COMMENTS/OBSERVATIONS:

Sample BH202M1 taken

SIGNATURE:

SL

WATER SAMPLING FIELD SHEET

eiaustralia

Site Address:	28 Elizabeth St. Liverpool	Job Number:	E24175
Client:		Date:	17-11-20
Field Staff:	SL	Sampling Location ID	BH201M.
Well Location:	BH201M	Round No:	1

MEDIUM ☒Groundwater ☐Surface Water ☐Stormwater ☐Other:

SAMPLING POINT INFO

Well Installation Date:		Stick up / down (m):	-0.09 (+ above ground - below ground)
Initial Well Depth (mBTOC):		Screen Interval (mBTOC):	
Previous Sampling Date:		Previous SWL (mBTOC):	

PID READINGS

PID Headspace (ppm):		PID Background (ppm):	
PID Breathing Space (ppm):			

PRE PURGE

Total Well Depth (mBTOC):	8.0	Well Head Condition:	good
SWL (mBTOC):	2.88	Water Column (m):	

PHASE SEPARATED HYDROCARBONS (PSH)

Depth to PSH (mBTOC):		PSH Visually Confirmed (Bailer):	
PSH Thickness (mm):			

PURGE AND SAMPLE

Sampling Method ☑Bladder ☐Peristaltic ☐Submersible ☐Other:

Depth of Pump Inlet (mBTOC):	7m	Fill Timer:	5
Pump Pressure Regulator (psi):	20	Discharge Timer:	10
Weather Conditions:	Sunny	Cycle:	cpm4
Pump on time:	11am	Pump off time:	

WATER QUALITY PARAMETERS

Probe Make and Model:		Bump Test Date and Time:	

Time	Volume (L)	SWL (mbtoc)	Temp (°C)	EC (µS/cm)	Redox (mV)	DO (mg/L)	pH (units)	Comments (colour, turbidity, odour, sheen etc.)
11:01	0.5	2.93	23.06	40750	-4.9	0	7.25	grey, low to medium, no, no
11:02	1.0	2.99	23.37	40430	-15.2	↓	6.92	↓
↓	1.5	3.03	23.40	42660	-31.2		6.91	
	2.0	3.07	23.41	42750	-37.4		6.97	
↓	2.5	3.10	23.40	42110	-30.6	↓	6.95	
11:06	3.0	3.12	23.42	42060	-21.7	0.04	6.96	
Stabilisation range: 3 consecutive readings			±0.2°C	±3%	±20mV	±10%	±0.2	

OTHER COMMENTS/OBSERVATIONS:

Sample BH201M-1 taken

SIGNATURE:

WATER SAMPLING FIELD SHEET

eiaustralia

Site Address: 28 Elizabeth St. Liverpool	Job Number: E24175
Client:	Date: 17-11-20
Field Staff: SC	Sampling Location ID BH205M
Well Location: BH205M	Round No: 1

MEDIUM ☑Groundwater ☐Surface Water ☐Stormwater ☐Other:

SAMPLING POINT INFO

Well Installation Date:	Stick up / down (m): +0.76 (+ above ground - below ground)
Initial Well Depth (mBTOC):	Screen Interval (mBTOC):
Previous Sampling Date:	Previous SWL (mBTOC):

PID READINGS

PID Headspace (ppm):	PID Background (ppm):
PID Breathing Space (ppm):	

PRE PURGE

Total Well Depth (mBTOC): 10.12	Well Head Condition: good
SWL (mBTOC): 3.76	Water Column (m):

PHASE SEPARATED HYDROCARBONS (PSH)

Depth to PSH (mBTOC):	PSH Visually Confirmed (Bailer):
PSH Thickness (mm):	

PURGE AND SAMPLE

Sampling Method ☑Bladder ☐Peristaltic ☐Submersible ☐Other:

Depth of Pump Inlet (mBTOC): 9m	Fill Timer: 5
Pump Pressure Regulator (psi): 20	Discharge Timer: 10
Weather Conditions: Cloudy	Cycle: cpm4
Pump on time: 10:20am	Pump off time:

WATER QUALITY PARAMETERS

Probe Make and Model:	Bump Test Date and Time:

Time	Volume (L)	SWL (mbtoc)	Temp (°C)	EC (µS/cm)	Redox (mV)	DO (mg/L)	pH (units)	Comments (colour, turbidity, odour, sheen etc.)
10:21	0.5	3.80	23.67	37120	133.0	0	6.58	pale grey, low, no, no
10:22	1.0	3.85	23.69	37750	126.4	0	6.63	
	1.5	3.88	23.60	35420	113.1		6.61	
	2.0	3.93	23.61	36975	137.2		6.60	
	2.5	3.97	23.61	37598	106.7		6.60	
	3.0	4.0	23.62	37632	124.1		6.59	
Stabilisation range: 3 consecutive readings			±0.2°C	±3%	±20mV	±10%	±0.2	

OTHER COMMENTS/OBSERVATIONS:

Sample BH205M-1 taken. BH200-GWQD1, BH200-GWQT1

SIGNATURE:

Sharon Li - EIAustralia

From: Jason Vane <jason@sslocators.com.au>
Sent: Friday, 4 December 2020 4:21 PM
To: Sharon Li - EIAustralia
Cc: Alejandra Beltran - EIAustralia
Subject: Re: Liverpool E24175

Hi Sharon,

A GPR survey was conducted at 28 Elizabeth St, Liverpool on 7th November. The GPR scan confirmed 5 Underground Storage Tanks exist at this site, there is also visual evidence (dipping points) supporting this.

Four Tanks are located within the same Tank farm on the Elizabeth St side of the site. A Fifth tank was located towards the middle of the site, right of the now demolished building.

Regards,

Jason Vane
0498 025 210
smartscanlocators.com.au
jason@sslocators.com.au

On Fri, Dec 4, 2020 at 10:24 AM Sharon Li - EIAustralia <sharon.li@eiaustralia.com.au> wrote:

> Hi Jason,
>
> Could you please issue a GPR survey report at 28 Elizabeth Street, Liverpool, NSW you did a few weeks ago? We need it by the end of today or early Monday morning.
>
> I have attached an aerial for your reference.

Appendix F – Chain of Custody and Sample Receipt Documentation

Sheet 1 of 3

Site: 18 Elizabeth St. Liverpool

Project No: E24785.E02.

Laboratory: SGS Australia
Unit 16, 33 Maddox Street,
ALEXANDRIA NSW 2015
P: 02 8594 0400 F: 02 8594 0499

Sample ID	Laboratory ID	Container Type	Sampling Date	Sampling Time	Sample Matrix: WATER	SOIL	OTHERS (i.e. Fibro, Paint, etc.)	Analysis: HM[A] /TRH/BTEX/PAHs OCP/OP/PCB/Asbestos	HM[A] /TRH/BTEX/PAHs	HM[A] /TRH/BTEX	BTEX / TRH / lead	VOCs	Asbestos	Asbestos Quantification	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	Dewatering Suite	sPOCAS	PFAS				TCLP HM[B] / PAH
BH201M_0.5-0.6	1	J, ZLB	9/11	AM		X		X														
1.2-1.3	2								X													
BH202M_0.4-0.5	3							X														
0.9-1.0																						
1.4-1.5																						
1.9-2.0																						
2.4-2.5	4										X											
2.9-3.0																						
3.4-3.5																						
3.9-4.0	5								X													
BH203_0.1-0.2	6							X														
0.6-0.7	7								X													

SGS EHS Sydney COC
SE213398

Comments

HM[A]
Arsenic
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Zinc

HM[B]
Arsenic
Cadmium
Chromium
Lead
Mercury
Nickel

Dewatering Suite
pH & EC
TDS / Turbidity NTU
Hardness
Total Cyanide
Metals (Al, As, Cd, Cr, Cu, Pb, Hg, Ni, Zn)
TRH (F1, F2, F3, F4)
BTEX
PAH
Total Phenol

LABORATORY TURNAROUND
- [x] Standard
- [ ] 24 Hours
- [ ] 48 Hours
- [ ] 72 Hours
- [ ] Other_____

Container Type:
J= solvent washed, acid rinsed,Teflon sealed, glass jar
S= solvent washed, acid rinsed glass bottle
P= natural HDPE plastic bottle
VC= glass vial, Teflon Septum
ZLB = Zip-Lock Bag

Investigator: I attest that these samples were collected in accordance with standard EI field sampling procedures.

Report with EI Waste Classification Table ☐

Sampler's Name (EI):	Received by (SGS):
Print: SL	Print: Suba
Signature: SL	Signature:
Date: 10/11/20	Date: 10/11/20 @ 3:10

Sampler's Comments:
Please cc Alejandra

IMPORTANT:
Please e-mail laboratory results to: lab@eiaustralia.com.au

eiaustralia
Contamination | Remediation | Geotechnical
Suite 6.01, 55 Miller Street,
PYRMONT NSW 2009
Ph: 9516 0722
lab@eiaustralia.com.au

Sheet 2 of 3

Site: 28 Elizabeth St, Liverpool

Project No: E24175.E02.

Laboratory: SGS Australia
Unit 16, 33 Maddox Street,
ALEXANDRIA NSW 2015
P: 02 8594 0400 F: 02 8594 0499

Sample ID	Laboratory ID	Container Type	Sampling Date	Sampling Time	Sample Matrix: WATER	SOIL	OTHERS (i.e. Fibro, Paint, etc.)	Analysis: HM [A] /TRH/BTEX/PAHs OCP/OP/PCB/Asbestos	HM [A] /TRH/BTEX/PAHs	HM [A] /TRH/BTEX	BTEX	VOCs	Asbestos	Asbestos Quantification	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	Dewatering Suite	sPOCAS	PFAS				TCLP HM [B] / PAH
BH204_0.2-0.3	8	J, ZCB	9/11	AM		X		X														
0.7-0.8																						
BH205M_0.2-0.3	9							X														
0.8-0.9																						
1.3-1.4	10								X													
BH206_0.2-0.3	11							X														
0.6-0.7	12								X													
BH207_0.2-0.3	13							X														
0.9-1.0	14								X													
BH208_0.2-0.3	15							X														
0.9-1.0																						
BH209_0.2-0.3	16	↓	↓	↓		↓		X														

Comments

HM [A]
Arsenic
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Zinc

HM [B]
Arsenic
Cadmium
Chromium
Lead
Mercury
Nickel

Dewatering Suite
pH & EC
TDS / Turbidity NTU
Hardness
Total Cyanide
Metals (Al, As, Cd, Cr, Cu, Pb, Hg, Ni, Zn)
TRH (F1, F2, F3, F4)
BTEX
PAH
Total Phenol

LABORATORY TURNAROUND

- [X] Standard
- [ ] 24 Hours
- [ ] 48 Hours
- [ ] 72 Hours
- [ ] Other_____

Container Type:
J= solvent washed, acid rinsed,Teflon sealed, glass jar
S= solvent washed, acid rinsed glass bottle
P= natural HDPE plastic bottle
VC= glass vial, Teflon Septum
ZLB = Zip-Lock Bag

Investigator: I attest that these samples were collected in accordance with standard EI field sampling procedures.

Report with EI Waste Classification Table ☐

Sampler's Name (EI):	Received by (SGS):
Print: SL	Print: Suba
Signature:	Signature:
Date: 10/11/20	Date: 10/11/20 @3:10

Sampler's Comments:

See 1st Page.

IMPORTANT:
Please e-mail laboratory results to: lab@eiaustralia.com.au

eiaustralia
Contamination | Remediation | Geotechnical
Suite 6.01, 55 Miller Street,
PYRMONT NSW 2009
Ph: 9516 0722
lab@eiaustralia.com.au

Sheet 3 of 3

Site: 28 Elizabeth St, Liverpool

Project No: E24175

Laboratory: SGS Australia
Unit 16, 33 Maddox Street,
ALEXANDRIA NSW 2015
P: 02 8594 0400 F: 02 8594 0499

Sample ID	Laboratory ID	Container Type	Sampling Date	Sampling Time	Sample Matrix: WATER	SOIL	OTHERS (i.e. Fibro, Paint, etc.)	Analysis: HM [A] /TRH/BTEX/PAHs OCP/OP/PCB/Asbestos	HM [A] /TRH/BTEX/PAHs	HM [A] /TRH/BTEX	BTEX	VOCs	Asbestos	Asbestos Quantification	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	Dewatering Suite	sPOCAS	PFAS				TCLP HM [B] / PAH
BH209_0.9-1.0		J/ZLB	9/11	PM		X																
BH210_0.2-0.3	17	↓	↓	↓		↓		X														
0.9-1.0																						
BH211_0.2-0.3	18							X														
0.8-0.9	19								X													
BH212_0.2-0.3	20							X														
0.7-0.8		↓																				
QD1	21	J				↓				X												
QR1	22	S,P,VC			X					X												
QRB1		↓	↓	↓	X																	
QTB1	23	VC	Lab Prepared			X					X											
QTS1											X											

Comments

HM [A]
Arsenic
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Zinc

HM [B]
Arsenic
Cadmium
Chromium
Lead
Mercury
Nickel

Dewatering Suite
pH & EC
TDS / Turbidity NTU
Hardness
Total Cyanide
Metals (Al, As, Cd, Cr, Cu, Pb, Hg, Ni, Zn)
TRH (F1, F2, F3, F4)
BTEX
PAH
Total Phenol

LABORATORY TURNAROUND

- [X] Standard
- [ ] 24 Hours
- [ ] 48 Hours
- [ ] 72 Hours
- [ ] Other_____

Container Type:
J= solvent washed, acid rinsed,Teflon sealed, glass jar
S= solvent washed, acid rinsed glass bottle
P= natural HDPE plastic bottle
VC= glass vial, Teflon Septum
ZLB = Zip-Lock Bag

Investigator: I attest that these samples were collected in accordance with standard EI field sampling procedures.

Report with EI Waste Classification Table ☐

Sampler's Name (EI):	Received by (SGS):
Print: SL	Print:
Signature:	Signature:
Date: 10/11/20	Date:

Sampler's Comments:
see 1st Page.

IMPORTANT:
Please e-mail laboratory results to: lab@eiaustralia.com.au

eiaustralia
Contamination | Remediation | Geotechnical
Suite 6.01, 55 Miller Street,
PYRMONT NSW 2009
Ph: 9516 0722
lab@eiaustralia.com.au

SAMPLE RECEIPT ADVICE

SE213398

CLIENT DETAILS

Contact	Alejandra Beltran
Client	EI AUSTRALIA
Address	SUITE 6.01 55 MILLER STREET PYRMONT NSW 2009
Telephone	61 2 95160722
Facsimile	(Not specified)
Email	Alejandra.beltran@eiaustralia.com.au
Project	**E24175.E02 28 Elizabeth St. Liverpool**
Order Number	**E24175.E02**
Samples	23

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	Tue 10/11/2020
Report Due	Tue 17/11/2020
SGS Reference	**SE213398**

SUBMISSION DETAILS

This is to confirm that 23 samples were received on Tuesday 10/11/2020. Results are expected to be ready by COB Tuesday 17/11/2020.
Please quote SGS reference SE213398 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 Bricks
Samples received in correct containers	Yes	Sample counts by matrix	22 Soil, 1 Water
Date documentation received	10/11/2020	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	8.3°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

11 soil and 1 water samples have been placed on hold as no tests have been assigned for them by the client. These samples will not be processed.
QTS1 not received.

SAMPLE RECEIPT ADVICE

SE213398

CLIENT DETAILS

Client EI AUSTRALIA

Project E24175.E02 28 Elizabeth St. Liverpool

SUMMARY OF ANALYSIS

No.	Sample ID	OC Pesticides in Soil	OP 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	BH201M_0.5-0.6	29	14	26	11	7	10	11	7
002	BH201M_1.2-1.3	-	-	26	-	7	10	11	7
003	BH202M_0.4-0.5	29	14	26	11	7	10	11	7
004	BH202M_2.4-2.5	-	-	-	-	1	10	11	7
005	BH202M_3.9-4.0	-	-	26	-	7	10	11	7
006	BH203_0.1-0.2	29	14	26	11	7	10	11	7
007	BH203_0.6-0.7	-	-	26	-	7	10	11	7
008	BH204_0.2-0.3	29	14	26	11	7	10	11	7
009	BH205M_0.2-0.3	29	14	26	11	7	10	11	7
010	BH205M_1.3-1.4	-	-	26	-	7	10	11	7
011	BH206_0.2-0.3	29	14	26	11	7	10	11	7
012	BH206_0.6-0.7	-	-	26	-	7	10	11	7
013	BH207_0.2-0.3	29	14	26	11	7	10	11	7
014	BH207_0.9-1.0	-	-	26	-	7	10	11	7
015	BH208_0.2-0.3	29	14	26	11	7	10	11	7
016	BH209_0.2-0.3	29	14	26	11	7	10	11	7
017	BH210_0.2-0.3	29	14	26	11	7	10	11	7
018	BH211_0.2-0.3	29	14	26	11	7	10	11	7
019	BH211_0.8-0.9	-	-	26	-	7	10	11	7
020	BH212_0.2-0.3	29	14	26	11	7	10	11	7
021	QD1	-	-	-	-	7	10	11	7
023	QTB1	-	-	-	-	-	-	11	-

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

SE213398

CLIENT DETAILS

Client EI AUSTRALIA

Project E24175.E02 28 Elizabeth St. Liverpool

SUMMARY OF ANALYSIS

No.	Sample ID	Fibre Identification in soil	Mercury in Soil	Moisture Content
001	BH201M_0.5-0.6	2	1	1
002	BH201M_1.2-1.3	-	1	1
003	BH202M_0.4-0.5	2	1	1
004	BH202M_2.4-2.5	-	-	1
005	BH202M_3.9-4.0	-	1	1
006	BH203_0.1-0.2	2	1	1
007	BH203_0.6-0.7	-	1	1
008	BH204_0.2-0.3	2	1	1
009	BH205M_0.2-0.3	2	1	1
010	BH205M_1.3-1.4	-	1	1
011	BH206_0.2-0.3	2	1	1
012	BH206_0.6-0.7	-	1	1
013	BH207_0.2-0.3	2	1	1
014	BH207_0.9-1.0	-	1	1
015	BH208_0.2-0.3	2	1	1
016	BH209_0.2-0.3	2	1	1
017	BH210_0.2-0.3	2	1	1
018	BH211_0.2-0.3	2	1	1
019	BH211_0.8-0.9	-	1	1
020	BH212_0.2-0.3	2	1	1
021	QD1	-	1	1
023	QTB1	-	-	1

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

SE213398

CLIENT DETAILS

Client EI AUSTRALIA

Project E24175.E02 28 Elizabeth St. Liverpool

SUMMARY OF ANALYSIS

No.	Sample ID	Mercury (dissolved) in Water	Trace Metals (Dissolved) in Water by ICPMS	TRH (Total Recoverable Hydrocarbons) in Water	VOCs in Water	Volatile Petroleum Hydrocarbons in Water
022	QR1	1	7	9	11	7

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 .

Sheet 1 of 1

Site: 18 Elizabeth St Liverpool

Project No: E24175

Laboratory: **Envirolab Services**
12 Ashley Street,
CHATSWOOD NSW 2067
P: 02 9910 6200

Sample ID	Laboratory ID	Container Type	Sampling Date	Sampling Time	Sample Matrix: WATER	SOIL	OTHERS (i.e. Fibro, Paint, etc.)	Analysis: HM[A] /TRH/BTEX/PAHs OCP/OP/PCB/Asbestos	HM[A] /TRH/BTEX/PAHs	HM[A] /TRH/BTEX	BTEX	VOCs	Asbestos	Asbestos Quantification	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	Dewatering Suite	sPOCAS	PFAS				TCLP HM[B] / PAH
QT1	1	J	9/11	AM		X		See email JYH. 20/11/20															

ENVIROLAB

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 255405
Date Received: 10/11/2020
Time Received: 16:22
Received by: TO
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

17.1

Comments

HM[A]
Arsenic
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Zinc

HM[B]
Arsenic
Cadmium
Chromium
Lead
Mercury
Nickel

Dewatering Suite
pH & EC
TDS / Turbidity NTU
Hardness
Total Cyanide
Metals (Al, As, Cd, Cr, Cu, Pb, Hg, Ni, Zn)
TRH (F1, F2, F3, F4)
BTEX
PAH
Total Phenol

LABORATORY TURNAROUND

- [x] ~~Standard~~
- [ ] 24 Hours
- [ ] 48 Hours
- [x] 72 Hours JYH.
- [ ] Other_____

Container Type:
J= solvent washed, acid rinsed,Teflon sealed, glass jar
S= solvent washed, acid rinsed glass bottle
P= natural HDPE plastic bottle
VC= glass vial, Teflon Septum
ZLB = Zip-Lock Bag

Investigator: I attest that these samples were collected in accordance with standard EI field sampling procedures.

Sampler's Name (EI):	Received by (Envirolab)
Print: SL	Print: Tanya Dahly
Signature:	Signature:
Date: 10/11/20	Date: 10/11/2020

IMPORTANT:
Please e-mail laboratory results to: lab@eiaustralia.com.au

Report with EI Waste Classification Table ☐

Sampler's Comments:
Please CC Alejandra.

eiaustralia
Contamination | Remediation | Geotechnical
Suite 6.01, 55 Miller Street,
PYRMONT NSW 2009
Ph: 9516 0722
lab@eiaustralia.com.au

Jessica Hie

From: Alejandra Beltran - EIAustralia <alejandra.beltran@eiaustralia.com.au>
Sent: Friday, 20 November 2020 10:55 AM
To: Simon Song; Customer Service
Subject: RE: Sample Receipt for 255405 E24175.E02, 28 Elizabeth St Liverpool

Hi Enviro lab,

Can you pelase test for HM^A, TRH BTEX on 72hr TAT.

With thanks,

Alejandra Beltran
BEng. (Civil)
Civil/Environmental Engineer
02 9516 0722 M 0433 512 322
alejandra.beltran@eiaustralia.com.au
Suite 6.01, 55 Miller Street
Pyrmont, NSW 2009
www.eiaustralia.com.au

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Practical Solutions for Built Environments

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From: Simon Song [mailto:SSong@envirolab.com.au]
Sent: Wednesday, 11 November 2020 12:08 PM
To: Laboratory Results - EIAustralia
Subject: Sample Receipt for 255405 E24175.E02, 28 Elizabeth St Liverpool

Please refer to attached for:
a copy of the COC/paperwork received from you
a copy of our Sample Receipt Advice (SRA)
Please open and read the SRA as it contains important information.
Please let the lab know immediately if there are any issues.

Results will be available by 6.30pm on the date indicated.

PLEASE NOTE COMBO PRICES WILL ONLY APPLY IF COMBOS ARE SELECTED ON COC.

We have a new reporting format and would welcome your feedback. Sydney@envirolab.com.au

Please note that subcontracted testing or non routine testing may take significantly longer than just the standard 5 day TAT, contact the lab to get an approximate due date.

Enquiries should be made directly to:
customerservice@envirolab.com.au

Sheet 1 of 1

Site: 28 Elizabeth St, Liverpool NSW

Project No: E24175

Laboratory: SGS Australia
Unit 16, 33 Maddox Street,
ALEXANDRIA NSW 2015
P: 02 8594 0400 F: 02 8594 0499

Sample ID	Laboratory ID	Container Type	Sampling Date	Sampling Time	Sample Matrix: WATER	SOIL	OTHERS (i.e. Fibro, Paint, etc.)
BH201M-1	1	S, P, VC	17/11	AM	X		
BH202M-1	2	↓	↓	↓	X		
BH205M-1	3				X		
BH200_GWQR1	4				X		
GWQR1	5				X		
GWQRB1							
GWQTS1	6	VC	Lab Prepared		X		
GWQTB1	7	VC			X		

Analysis

HM[A] /TRH/BTEX/PAHs OCP/OP/PCB/Asbestos #	HM[A] /TRH/BTEX/PAHs	HM[A] /TRH/BTEX	BTEX	VOCs	Asbestos	Asbestos Quantification	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	Dewatering Suite	sPOCAS	PFAS	Phenolic Compounds (Acetal)	Chlorinated Hydrocarbons		TCLP HM[B] / PAH
	X			X								X	X		
	X			X								X	X		
	X			X								X	X		
		X													
		X													
			X												
			X												

SGS EHS Sydney COC
SE213672

Comments

HM[A] # + AL.
Arsenic
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Zinc

HM[B]
Arsenic
Cadmium
Chromium
Lead
Mercury
Nickel

Dewatering Suite
pH & EC
TDS / Turbidity NTU
Hardness
Total Cyanide
Metals (Al, As, Cd, Cr, Cu, Pb, Hg, Ni, Zn)
TRH (F1, F2, F3, F4)
BTEX
PAH
Total Phenol

LABORATORY TURNAROUND

- ☐ Standard
- ☐ 24 Hours
- ☒ 48 Hours
- ☐ 72 Hours
- ☐ Other_____

Container Type:
J= solvent washed, acid rinsed,Teflon sealed, glass jar
S= solvent washed, acid rinsed glass bottle
P= natural HDPE plastic bottle
VC= glass vial, Teflon Septum
ZLB = Zip-Lock Bag

Investigator: I attest that these samples were collected in accordance with standard EI field sampling procedures.

Report with EI Waste Classification Table ☐

Sampler's Name (EI):	Received by (SGS):
Print: SL	Print: George Zhi
Signature:	Signature:
Date: 17/11/2020	Date: 17/11/20@1:50pm

Sampler's Comments:
① Please CC Alejandra. B.
② Please send BH200_GWQR1 to enviro lab.

IMPORTANT:
Please e-mail laboratory results to: lab@eiaustralia.com.au

eiaustralia
Contamination | Remediation | Geotechnical
Suite 6.01, 55 Miller Street,
PYRMONT NSW 2009
Ph: 9516 0722
lab@eiaustralia.com.au

SAMPLE RECEIPT ADVICE

SE213672

CLIENT DETAILS

Contact	Alejandra Beltran
Client	EI AUSTRALIA
Address	SUITE 6.01 55 MILLER STREET PYRMONT NSW 2009
Telephone	61 2 95160722
Facsimile	(Not specified)
Email	Alejandra.beltran@eiaustralia.com.au
Project	**E24175 28 Elizabeth St, Liverpool NSW**
Order Number	**E24175**
Samples	7

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	Tue 17/11/2020
Report Due	Thu 19/11/2020
SGS Reference	**SE213672**

SUBMISSION DETAILS

This is to confirm that 7 samples were received on Tuesday 17/11/2020. Results are expected to be ready by COB Thursday 19/11/2020. Please quote SGS reference SE213672 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 Bricks
Samples received in correct containers	Yes	Sample counts by matrix	7 Water
Date documentation received	17/11/2020	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	18°C	Sufficient sample for analysis	Yes
Turnaround time requested	Two Days		

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

1 sample has been placed on hold as no tests have been assigned for it. This sample will not be processed.

SAMPLE RECEIPT ADVICE

SE213672

CLIENT DETAILS

Client EI AUSTRALIA

Project E24175 28 Elizabeth St, Liverpool NSW

SUMMARY OF ANALYSIS

No.	Sample ID	Mercury (dissolved) in Water	PAH (Polynuclear Aromatic Hydrocarbons) in Water	Total Phenolics in Water	Trace Metals (Dissolved) in Water by ICPMS	TRH (Total Recoverable Hydrocarbons) in Water	VOCs in Water	Volatile Petroleum Hydrocarbons in Water
001	BH201M-1	1	22	1	8	9	78	7
002	BH202M-1	1	22	1	8	9	78	7
003	BH205M-1	1	22	1	8	9	78	7
004	BH200_GWQD1	1	-	-	7	9	11	7
005	GWQR1	1	-	-	7	9	11	7
006	GWQTS1	-	-	-	-	-	11	-
007	GWQTB1	-	-	-	-	-	11	-

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 .

Sheet 1 of 1

Site: 78 Elizabeth St, Liverpool

Project No: E24175

Laboratory: Envirolab Services
12 Ashley Street,
CHATSWOOD NSW 2067
P: 02 9910 6200

	Sample ID	Laboratory ID	Container Type	Sampling Date	Sampling Time	Sample Matrix: WATER	SOIL	OTHERS (i.e. Fibro, Paint, etc.)	Analysis: HM[A] /TRH/BTEX/PAHs OCP/OP/PCB/Asbestos	HM[A] /TRH/BTEX/PAHs	HM[A] /TRH/BTEX	BTEX	VOCs	Asbestos	Asbestos Quantification	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	Dewatering Suite	sPOCAS	PFAS				TCLP HM[B] / PAH
(1)	BH200_GW0.1		SP, VC	17-11	AM	X					X													

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 256059
Date Received: 18/11/20
Time Received: 1520
Received By: JD
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Comments

HM[A]
Arsenic
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Zinc

HM[B]
Arsenic
Cadmium
Chromium
Lead
Mercury
Nickel

Dewatering Suite
pH & EC
TDS / Turbidity NTU
Hardness
Total Cyanide
Metals (Al, As, Cd, Cr, Cu, Pb, Hg, Ni, Zn)
TRH (F1, F2, F3, F4)
BTEX
PAH
Total Phenol

LABORATORY TURNAROUND

- ☐ Standard
- ☐ 24 Hours
- ☒ 48 Hours
- ☐ 72 Hours
- ☐ Other_____

Container Type:
J= solvent washed, acid rinsed,Teflon sealed, glass jar
S= solvent washed, acid rinsed glass bottle
P= natural HDPE plastic bottle
VC= glass vial, Teflon Septum
ZLB = Zip-Lock Bag

Investigator: I attest that these samples were collected in accordance with standard EI field sampling procedures.

Report with EI Waste Classification Table ☐

Sampler's Name (EI):	Received by (Envirolab) SYO
Print: SC	Print: Jason Day
Signature:	Signature:
Date: 17/11/2020	Date: 18/11/20 1520

Sampler's Comments: Please cc Alejandra. R

IMPORTANT:
Please e-mail laboratory results to: lab@eiaustralia.com.au

eiaustralia
Contamination | Remediation | Geotechnical
Suite 6.01, 55 Miller Street,
PYRMONT NSW 2009
Ph: 9516 0722
lab@eiaustralia.com.au

Sheet 1 of 1

Site: 28 Elizabeth St, Liverpool NSW

Project No: E24175

Laboratory: SGS Australia
Unit 16, 33 Maddox Street,
ALEXANDRIA NSW 2015
P: 02 8594 0400 F: 02 8594 0499

Sample ID	Laboratory ID	Container Type	Sampling Date	Sampling Time	Sample Matrix: WATER	SOIL	OTHERS (i.e. Fibro, Paint, etc.)	Analysis: HM[A] /TRH/BTEX/PAHs OCP/OP/PCB/Asbestos	HM[A] /TRH/BTEX/PAHs	HM[A] /TRH/BTEX	BTEX	VOCs	Asbestos	Asbestos Quantification	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	Dewatering Suite	sPOCAS	PFAS	Phenolic Compounds (total)	Chlorinated Hydrocarbons		TCLP HM[B] / PAH
BH201M-1		S, P, VC	17/11	AM	X				X			X								X	X		
BH202M-1		↓	↓	↓	↓				X			X								X	X		
BH205M-1									X			X								X	X		
BH200_GWQR1										X													
GWQR1										X													
GWQRB1																							
GWQTS1		VC	Lab Prepared								X							·					
GWQTB1		VC			↓						X												

Comments

HM[A] # + AL.
Arsenic
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Zinc

HM[B]
Arsenic
Cadmium
Chromium
Lead
Mercury
Nickel

Dewatering Suite
pH & EC
TDS / Turbidity NTU
Hardness
Total Cyanide
Metals (Al, As, Cd, Cr, Cu, Pb, Hg, Ni, Zn)
TRH (F1, F2, F3, F4)
BTEX
PAH
Total Phenol

LABORATORY TURNAROUND

- ☐ Standard
- ☐ 24 Hours
- ☒ 48 Hours
- ☐ 72 Hours
- ☐ Other_____

Container Type:
J= solvent washed, acid rinsed,Teflon sealed, glass jar
S= solvent washed, acid rinsed glass bottle
P= natural HDPE plastic bottle
VC= glass vial, Teflon Septum
ZLB = Zip-Lock Bag

Investigator: I attest that these samples were collected in accordance with standard EI field sampling procedures.

Report with EI Waste Classification Table ☐

Sampler's Name (EI):	Received by (SGS):
Print: SL	Print:
Signature:	Signature:
Date: 17/11/2020	Date:

IMPORTANT:
Please e-mail laboratory results to: lab@eiaustralia.com.au

Sampler's Comments:
① Please CC Alejandra. B.
② Please send BH200_GWQT1 to enviro lab. 256089

eiaustralia
Contamination + Remediation + Geotechnics
Suite 6.01, 55 Miller Street,
PYRMONT NSW 2009
Ph: 9516 0722
lab@eiaustralia.com.au

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	EI Australia
Attention	Alejandra Beltran

Sample Login Details

Your reference	E24175
Envirolab Reference	256059
Date Sample Received	18/11/2020
Date Instructions Received	18/11/2020
Date Results Expected to be Reported	20/11/2020

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	1 Water
Turnaround Time Requested	2 days
Temperature on Receipt (°C)	10.8
Cooling Method	None
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	vTRH(C6-C10)/BTEXN in Water	svTRH (C10-C40) in Water	HM in water - dissolved
BH200_GWQT1	✓	✓	✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

Appendix G – Laboratory Analytical Reports

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Alejandra Beltran
Client	EI AUSTRALIA
Address	SUITE 6.01 55 MILLER STREET PYRMONT NSW 2009
Telephone	61 2 95160722
Facsimile	(Not specified)
Email	Alejandra.beltran@eiaustralia.com.au
Project	**E24175.E02 28 Elizabeth St. Liverpool**
Order Number	**E24175.E02**
Samples	23

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	**SE213398 R0**
Date Received	10/11/2020
Date Reported	17/11/2020

COMMENTS

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

No respirable fibres detected in all soil samples using trace analysis technique.

Sample #13: Asbestos found in approx 10x6x3mm cement sheet fragments.
Sample #16: Asbestos found in approx 10x5x3mm cement sheet fragment.
Sample #17: Asbestos found in approx 25x10x4mm cement sheet fragments.

Asbestos analysed by Approved Identifier Yusuf Kuthpudin.

SIGNATORIES

Akheeqar BENIAMEEN
Chemist

Dong LIANG
Metals/Inorganics Team Leader

Kamrul AHSAN
Senior Chemist

Yusuf KUTHPUDIN
Asbestos Analyst

VOC's in Soil [AN433] Tested: 11/11/2020

PARAMETER	UOM	LOR	BH201M_0.5-0.6 SOIL - 9/11/2020 SE213398.001	BH201M_1.2-1.3 SOIL - 9/11/2020 SE213398.002	BH202M_0.4-0.5 SOIL - 9/11/2020 SE213398.003	BH202M_2.4-2.5 SOIL - 9/11/2020 SE213398.004	BH202M_3.9-4.0 SOIL - 9/11/2020 SE213398.005
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	0.1	<0.1

PARAMETER	UOM	LOR	BH203_0.1-0.2 SOIL - 9/11/2020 SE213398.006	BH203_0.6-0.7 SOIL - 9/11/2020 SE213398.007	BH204_0.2-0.3 SOIL - 9/11/2020 SE213398.008	BH205M_0.2-0.3 SOIL - 9/11/2020 SE213398.009	BH205M_1.3-1.4 SOIL - 9/11/2020 SE213398.010
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

PARAMETER	UOM	LOR	BH206_0.2-0.3 SOIL - 9/11/2020 SE213398.011	BH206_0.6-0.7 SOIL - 9/11/2020 SE213398.012	BH207_0.2-0.3 SOIL - 9/11/2020 SE213398.013	BH207_0.9-1.0 SOIL - 9/11/2020 SE213398.014	BH208_0.2-0.3 SOIL - 9/11/2020 SE213398.015
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

PARAMETER	UOM	LOR	BH209_0.2-0.3 SOIL - 9/11/2020 SE213398.016	BH210_0.2-0.3 SOIL - 9/11/2020 SE213398.017	BH211_0.2-0.3 SOIL - 9/11/2020 SE213398.018	BH211_0.8-0.9 SOIL - 9/11/2020 SE213398.019	BH212_0.2-0.3 SOIL - 9/11/2020 SE213398.020
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

VOC's in Soil [AN433] Tested: 11/11/2020 (continued)

PARAMETER	UOM	LOR	QD1 SOIL - 9/11/2020 SE213398.021	QTB1 SOIL - 9/11/2020 SE213398.023
Benzene	mg/kg	0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1

Volatile Petroleum Hydrocarbons in Soil [AN433] Tested: 11/11/2020

PARAMETER	UOM	LOR	BH201M_0.5-0.6 SOIL - 9/11/2020 SE213398.001	BH201M_1.2-1.3 SOIL - 9/11/2020 SE213398.002	BH202M_0.4-0.5 SOIL - 9/11/2020 SE213398.003	BH202M_2.4-2.5 SOIL - 9/11/2020 SE213398.004	BH202M_3.9-4.0 SOIL - 9/11/2020 SE213398.005
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25

PARAMETER	UOM	LOR	BH203_0.1-0.2 SOIL - 9/11/2020 SE213398.006	BH203_0.6-0.7 SOIL - 9/11/2020 SE213398.007	BH204_0.2-0.3 SOIL - 9/11/2020 SE213398.008	BH205M_0.2-0.3 SOIL - 9/11/2020 SE213398.009	BH205M_1.3-1.4 SOIL - 9/11/2020 SE213398.010
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25

PARAMETER	UOM	LOR	BH206_0.2-0.3 SOIL - 9/11/2020 SE213398.011	BH206_0.6-0.7 SOIL - 9/11/2020 SE213398.012	BH207_0.2-0.3 SOIL - 9/11/2020 SE213398.013	BH207_0.9-1.0 SOIL - 9/11/2020 SE213398.014	BH208_0.2-0.3 SOIL - 9/11/2020 SE213398.015
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25

PARAMETER	UOM	LOR	BH209_0.2-0.3 SOIL - 9/11/2020 SE213398.016	BH210_0.2-0.3 SOIL - 9/11/2020 SE213398.017	BH211_0.2-0.3 SOIL - 9/11/2020 SE213398.018	BH211_0.8-0.9 SOIL - 9/11/2020 SE213398.019	BH212_0.2-0.3 SOIL - 9/11/2020 SE213398.020
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25

PARAMETER	UOM	LOR	QD1 SOIL - 9/11/2020 SE213398.021
TRH C6-C9	mg/kg	20	<20
Benzene (F0)	mg/kg	0.1	<0.1
TRH C6-C10	mg/kg	25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25

TRH (Total Recoverable Hydrocarbons) in Soil [AN403] Tested: 11/11/2020

PARAMETER	UOM	LOR	BH201M_0.5-0.6 SOIL - 9/11/2020 SE213398.001	BH201M_1.2-1.3 SOIL - 9/11/2020 SE213398.002	BH202M_0.4-0.5 SOIL - 9/11/2020 SE213398.003	BH202M_2.4-2.5 SOIL - 9/11/2020 SE213398.004	BH202M_3.9-4.0 SOIL - 9/11/2020 SE213398.005
TRH C10-C14	mg/kg	20	<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45	<45	**50**	<45
TRH C29-C36	mg/kg	45	<45	<45	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100	<100
TRH >C10-C16	mg/kg	25	<25	<25	<25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	<110	<110	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210	<210	<210

PARAMETER	UOM	LOR	BH203_0.1-0.2 SOIL - 9/11/2020 SE213398.006	BH203_0.6-0.7 SOIL - 9/11/2020 SE213398.007	BH204_0.2-0.3 SOIL - 9/11/2020 SE213398.008	BH205M_0.2-0.3 SOIL - 9/11/2020 SE213398.009	BH205M_1.3-1.4 SOIL - 9/11/2020 SE213398.010
TRH C10-C14	mg/kg	20	<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	**47**	<45	<45	<45	<45
TRH C29-C36	mg/kg	45	<45	<45	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100	<100
TRH >C10-C16	mg/kg	25	<25	<25	<25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	<110	<110	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210	<210	<210

PARAMETER	UOM	LOR	BH206_0.2-0.3 SOIL - 9/11/2020 SE213398.011	BH206_0.6-0.7 SOIL - 9/11/2020 SE213398.012	BH207_0.2-0.3 SOIL - 9/11/2020 SE213398.013	BH207_0.9-1.0 SOIL - 9/11/2020 SE213398.014	BH208_0.2-0.3 SOIL - 9/11/2020 SE213398.015
TRH C10-C14	mg/kg	20	<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45	<45	<45	**48**
TRH C29-C36	mg/kg	45	<45	<45	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100	<100
TRH >C10-C16	mg/kg	25	<25	<25	<25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	<110	<110	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210	<210	<210

TRH (Total Recoverable Hydrocarbons) in Soil [AN403] Tested: 11/11/2020 (continued)

PARAMETER	UOM	LOR	BH209_0.2-0.3 SOIL - 9/11/2020 SE213398.016	BH210_0.2-0.3 SOIL - 9/11/2020 SE213398.017	BH211_0.2-0.3 SOIL - 9/11/2020 SE213398.018	BH211_0.8-0.9 SOIL - 9/11/2020 SE213398.019	BH212_0.2-0.3 SOIL - 9/11/2020 SE213398.020
TRH C10-C14	mg/kg	20	<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	<45	**120**	<45	<45	<45
TRH C29-C36	mg/kg	45	<45	**60**	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100	<100
TRH >C10-C16	mg/kg	25	<25	<25	<25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	**160**	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	**180**	<110	<110	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210	<210	<210

PARAMETER	UOM	LOR	QD1 SOIL - 9/11/2020 SE213398.021
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-C16	mg/kg	25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120
TRH C10-C36 Total	mg/kg	110	<110
TRH >C10-C40 Total (F bands)	mg/kg	210	<210

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420] Tested: 11/11/2020

PARAMETER	UOM	LOR	BH201M_0.5-0.6 SOIL - 9/11/2020 SE213398.001	BH201M_1.2-1.3 SOIL - 9/11/2020 SE213398.002	BH202M_0.4-0.5 SOIL - 9/11/2020 SE213398.003	BH202M_3.9-4.0 SOIL - 9/11/2020 SE213398.005	BH203_0.1-0.2 SOIL - 9/11/2020 SE213398.006
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	0.1	<0.1	<0.1	0.1	0.2
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	0.3	<0.1	<0.1	<0.1	0.6
Pyrene	mg/kg	0.1	0.3	<0.1	<0.1	<0.1	0.6
Benzo(a)anthracene	mg/kg	0.1	0.2	<0.1	<0.1	<0.1	0.3
Chrysene	mg/kg	0.1	0.2	<0.1	<0.1	<0.1	0.3
Benzo(b&j)fluoranthene	mg/kg	0.1	0.2	<0.1	<0.1	<0.1	0.4
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	0.1
Benzo(a)pyrene	mg/kg	0.1	0.1	<0.1	<0.1	<0.1	0.2
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<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	<0.2	0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	<0.3	<0.3	<0.3	0.4
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	0.2	<0.2	<0.2	<0.2	0.4
Total PAH (18)	mg/kg	0.8	1.3	<0.8	<0.8	<0.8	3.0
Total PAH (NEPM/WHO 16)	mg/kg	0.8	1.3	<0.8	<0.8	<0.8	3.0

PARAMETER	UOM	LOR	BH203_0.6-0.7 SOIL - 9/11/2020 SE213398.007	BH204_0.2-0.3 SOIL - 9/11/2020 SE213398.008	BH205M_0.2-0.3 SOIL - 9/11/2020 SE213398.009	BH205M_1.3-1.4 SOIL - 9/11/2020 SE213398.010	BH206_0.2-0.3 SOIL - 9/11/2020 SE213398.011
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	0.5
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	0.1
Fluoranthene	mg/kg	0.1	<0.1	0.3	<0.1	<0.1	1.3
Pyrene	mg/kg	0.1	<0.1	0.3	<0.1	<0.1	1.1
Benzo(a)anthracene	mg/kg	0.1	<0.1	0.2	<0.1	<0.1	0.7
Chrysene	mg/kg	0.1	<0.1	0.2	<0.1	<0.1	0.6
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	0.2	<0.1	<0.1	0.6
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	0.2
Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	0.5
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	0.3
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	0.3
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2	<0.2	0.7
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	<0.3	<0.3	<0.3	0.8
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2	<0.2	0.7
Total PAH (18)	mg/kg	0.8	<0.8	1.1	<0.8	<0.8	6.3
Total PAH (NEPM/WHO 16)	mg/kg	0.8	<0.8	1.1	<0.8	<0.8	6.3

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420] Tested: 11/11/2020 (continued)

PARAMETER	UOM	LOR	BH206_0.6-0.7 SOIL - 9/11/2020 SE213398.012	BH207_0.2-0.3 SOIL - 9/11/2020 SE213398.013	BH207_0.9-1.0 SOIL - 9/11/2020 SE213398.014	BH208_0.2-0.3 SOIL - 9/11/2020 SE213398.015	BH209_0.2-0.3 SOIL - 9/11/2020 SE213398.016
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	0.2	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1	<0.1	0.6	0.2
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	0.2	<0.1
Fluoranthene	mg/kg	0.1	<0.1	0.2	<0.1	2.1	0.2
Pyrene	mg/kg	0.1	<0.1	0.2	<0.1	1.8	0.2
Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	1.0	<0.1
Chrysene	mg/kg	0.1	<0.1	<0.1	<0.1	0.9	0.2
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	1.1	0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	0.4	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	0.8	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	0.5	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	<0.1	0.5	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2	1.1	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	<0.3	<0.3	1.2	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2	1.2	<0.2
Total PAH (18)	mg/kg	0.8	<0.8	<0.8	<0.8	10	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	<0.8	<0.8	<0.8	10	<0.8

PARAMETER	UOM	LOR	BH210_0.2-0.3 SOIL - 9/11/2020 SE213398.017	BH211_0.2-0.3 SOIL - 9/11/2020 SE213398.018	BH211_0.8-0.9 SOIL - 9/11/2020 SE213398.019	BH212_0.2-0.3 SOIL - 9/11/2020 SE213398.020
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	0.2	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	0.5	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	3.7	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.1	0.8	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	4.4	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	4.2	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	2.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.1	1.8	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	1.7	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	0.5	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	1.3	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	0.5	<0.1	<0.1	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	0.5	<0.1	<0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	1.8	<0.2	<0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	1.9	<0.3	<0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	1.9	<0.2	<0.2	<0.2
Total PAH (18)	mg/kg	0.8	22	<0.8	<0.8	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	22	<0.8	<0.8	<0.8

OC Pesticides in Soil [AN420] Tested: 11/11/2020

PARAMETER	UOM	LOR	BH201M_0.5-0.6 SOIL - 9/11/2020 SE213398.001	BH202M_0.4-0.5 SOIL - 9/11/2020 SE213398.003	BH203_0.1-0.2 SOIL - 9/11/2020 SE213398.006	BH204_0.2-0.3 SOIL - 9/11/2020 SE213398.008	BH205M_0.2-0.3 SOIL - 9/11/2020 SE213398.009
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	<1	<1	<1	<1	<1

OC Pesticides in Soil [AN420] Tested: 11/11/2020 (continued)

PARAMETER	UOM	LOR	BH206_0.2-0.3 SOIL - 9/11/2020 SE213398.011	BH207_0.2-0.3 SOIL - 9/11/2020 SE213398.013	BH208_0.2-0.3 SOIL - 9/11/2020 SE213398.015	BH209_0.2-0.3 SOIL - 9/11/2020 SE213398.016	BH210_0.2-0.3 SOIL - 9/11/2020 SE213398.017
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	<1	<1	<1	<1	<1

OC Pesticides in Soil [AN420] Tested: 11/11/2020 (continued)

PARAMETER	UOM	LOR	BH211_0.2-0.3 SOIL - 9/11/2020 SE213398.018	BH212_0.2-0.3 SOIL - 9/11/2020 SE213398.020
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	<1	<1

OP Pesticides in Soil [AN420] Tested: 11/11/2020

PARAMETER	UOM	LOR	BH201M_0.5-0.6 SOIL - 9/11/2020 SE213398.001	BH202M_0.4-0.5 SOIL - 9/11/2020 SE213398.003	BH203_0.1-0.2 SOIL - 9/11/2020 SE213398.006	BH204_0.2-0.3 SOIL - 9/11/2020 SE213398.008	BH205M_0.2-0.3 SOIL - 9/11/2020 SE213398.009
Dichlorvos	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	<1.7	<1.7	<1.7

PARAMETER	UOM	LOR	BH206_0.2-0.3 SOIL - 9/11/2020 SE213398.011	BH207_0.2-0.3 SOIL - 9/11/2020 SE213398.013	BH208_0.2-0.3 SOIL - 9/11/2020 SE213398.015	BH209_0.2-0.3 SOIL - 9/11/2020 SE213398.016	BH210_0.2-0.3 SOIL - 9/11/2020 SE213398.017
Dichlorvos	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	<1.7	<1.7	<1.7

PARAMETER	UOM	LOR	BH211_0.2-0.3 SOIL - 9/11/2020 SE213398.018	BH212_0.2-0.3 SOIL - 9/11/2020 SE213398.020
Dichlorvos	mg/kg	0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2
Malathion	mg/kg	0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2
Methidathion	mg/kg	0.5	<0.5	<0.5
Ethion	mg/kg	0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2
Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7

PCBs in Soil [AN420] Tested: 11/11/2020

PARAMETER	UOM	LOR	BH201M_0.5-0.6 SOIL - 9/11/2020 SE213398.001	BH202M_0.4-0.5 SOIL - 9/11/2020 SE213398.003	BH203_0.1-0.2 SOIL - 9/11/2020 SE213398.006	BH204_0.2-0.3 SOIL - 9/11/2020 SE213398.008	BH205M_0.2-0.3 SOIL - 9/11/2020 SE213398.009
Arochlor 1016	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1	<1	<1	<1	<1

PARAMETER	UOM	LOR	BH206_0.2-0.3 SOIL - 9/11/2020 SE213398.011	BH207_0.2-0.3 SOIL - 9/11/2020 SE213398.013	BH208_0.2-0.3 SOIL - 9/11/2020 SE213398.015	BH209_0.2-0.3 SOIL - 9/11/2020 SE213398.016	BH210_0.2-0.3 SOIL - 9/11/2020 SE213398.017
Arochlor 1016	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1	<1	<1	<1	<1

PARAMETER	UOM	LOR	BH211_0.2-0.3 SOIL - 9/11/2020 SE213398.018	BH212_0.2-0.3 SOIL - 9/11/2020 SE213398.020
Arochlor 1016	mg/kg	0.2	<0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1	<1

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 11/11/2020

PARAMETER	UOM	LOR	BH201M_0.5-0.6 SOIL - 9/11/2020 SE213398.001	BH201M_1.2-1.3 SOIL - 9/11/2020 SE213398.002	BH202M_0.4-0.5 SOIL - 9/11/2020 SE213398.003	BH202M_2.4-2.5 SOIL - 9/11/2020 SE213398.004	BH202M_3.9-4.0 SOIL - 9/11/2020 SE213398.005
Arsenic, As	mg/kg	1	8	8	2	-	<1
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	-	<0.3
Chromium, Cr	mg/kg	0.5	17	11	2.5	-	0.7
Copper, Cu	mg/kg	0.5	13	12	1.7	-	6.5
Lead, Pb	mg/kg	1	16	11	8	3	4
Nickel, Ni	mg/kg	0.5	4.3	2.7	1.0	-	0.9
Zinc, Zn	mg/kg	2	17	8.7	16	-	3.1

PARAMETER	UOM	LOR	BH203_0.1-0.2 SOIL - 9/11/2020 SE213398.006	BH203_0.6-0.7 SOIL - 9/11/2020 SE213398.007	BH204_0.2-0.3 SOIL - 9/11/2020 SE213398.008	BH205M_0.2-0.3 SOIL - 9/11/2020 SE213398.009	BH205M_1.3-1.4 SOIL - 9/11/2020 SE213398.010
Arsenic, As	mg/kg	1	7	4	6	7	9
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	17	9.6	12	17	15
Copper, Cu	mg/kg	0.5	30	7.7	15	5.6	9.0
Lead, Pb	mg/kg	1	160	10	75	17	12
Nickel, Ni	mg/kg	0.5	8.0	4.6	6.3	3.2	1.6
Zinc, Zn	mg/kg	2	250	6.7	84	12	11

PARAMETER	UOM	LOR	BH206_0.2-0.3 SOIL - 9/11/2020 SE213398.011	BH206_0.6-0.7 SOIL - 9/11/2020 SE213398.012	BH207_0.2-0.3 SOIL - 9/11/2020 SE213398.013	BH207_0.9-1.0 SOIL - 9/11/2020 SE213398.014	BH208_0.2-0.3 SOIL - 9/11/2020 SE213398.015
Arsenic, As	mg/kg	1	6	4	4	7	6
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	13	11	8.7	10	14
Copper, Cu	mg/kg	0.5	14	7.2	10	7.9	28
Lead, Pb	mg/kg	1	43	9	49	10	170
Nickel, Ni	mg/kg	0.5	8.3	3.4	3.9	0.9	7.7
Zinc, Zn	mg/kg	2	58	8.9	42	6.8	170

PARAMETER	UOM	LOR	BH209_0.2-0.3 SOIL - 9/11/2020 SE213398.016	BH210_0.2-0.3 SOIL - 9/11/2020 SE213398.017	BH211_0.2-0.3 SOIL - 9/11/2020 SE213398.018	BH211_0.8-0.9 SOIL - 9/11/2020 SE213398.019	BH212_0.2-0.3 SOIL - 9/11/2020 SE213398.020
Arsenic, As	mg/kg	1	8	6	4	4	5
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	80	14	5.3	12	9.0
Copper, Cu	mg/kg	0.5	29	35	5.1	8.9	7.5
Lead, Pb	mg/kg	1	24	180	41	8	25
Nickel, Ni	mg/kg	0.5	87	8.1	3.1	2.7	4.5
Zinc, Zn	mg/kg	2	94	240	65	11	20

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 11/11/2020

(continued)

PARAMETER	UOM	LOR	QD1 SOIL - 9/11/2020 SE213398.021
Arsenic, As	mg/kg	1	**4**
Cadmium, Cd	mg/kg	0.3	<0.3
Chromium, Cr	mg/kg	0.5	**15**
Copper, Cu	mg/kg	0.5	**9.6**
Lead, Pb	mg/kg	1	**13**
Nickel, Ni	mg/kg	0.5	**3.0**
Zinc, Zn	mg/kg	2	**11**

Mercury in Soil [AN312] Tested: 11/11/2020

PARAMETER	UOM	LOR	BH201M_0.5-0.6 SOIL - 9/11/2020 SE213398.001	BH201M_1.2-1.3 SOIL - 9/11/2020 SE213398.002	BH202M_0.4-0.5 SOIL - 9/11/2020 SE213398.003	BH202M_3.9-4.0 SOIL - 9/11/2020 SE213398.005	BH203_0.1-0.2 SOIL - 9/11/2020 SE213398.006
Mercury	mg/kg	0.05	**0.12**	<0.05	<0.05	<0.05	**0.70**

PARAMETER	UOM	LOR	BH203_0.6-0.7 SOIL - 9/11/2020 SE213398.007	BH204_0.2-0.3 SOIL - 9/11/2020 SE213398.008	BH205M_0.2-0.3 SOIL - 9/11/2020 SE213398.009	BH205M_1.3-1.4 SOIL - 9/11/2020 SE213398.010	BH206_0.2-0.3 SOIL - 9/11/2020 SE213398.011
Mercury	mg/kg	0.05	<0.05	**0.31**	<0.05	<0.05	**0.20**

PARAMETER	UOM	LOR	BH206_0.6-0.7 SOIL - 9/11/2020 SE213398.012	BH207_0.2-0.3 SOIL - 9/11/2020 SE213398.013	BH207_0.9-1.0 SOIL - 9/11/2020 SE213398.014	BH208_0.2-0.3 SOIL - 9/11/2020 SE213398.015	BH209_0.2-0.3 SOIL - 9/11/2020 SE213398.016
Mercury	mg/kg	0.05	<0.05	**0.28**	<0.05	**0.29**	**0.05**

PARAMETER	UOM	LOR	BH210_0.2-0.3 SOIL - 9/11/2020 SE213398.017	BH211_0.2-0.3 SOIL - 9/11/2020 SE213398.018	BH211_0.8-0.9 SOIL - 9/11/2020 SE213398.019	BH212_0.2-0.3 SOIL - 9/11/2020 SE213398.020	QD1 SOIL - 9/11/2020 SE213398.021
Mercury	mg/kg	0.05	**0.32**	**0.10**	<0.05	**0.05**	<0.05

Moisture Content [AN002] Tested: 11/11/2020

PARAMETER	UOM	LOR	BH201M_0.5-0.6 SOIL - 9/11/2020 SE213398.001	BH201M_1.2-1.3 SOIL - 9/11/2020 SE213398.002	BH202M_0.4-0.5 SOIL - 9/11/2020 SE213398.003	BH202M_2.4-2.5 SOIL - 9/11/2020 SE213398.004	BH202M_3.9-4.0 SOIL - 9/11/2020 SE213398.005
% Moisture	%w/w	1	26.0	21.0	18.4	19.8	18.4

PARAMETER	UOM	LOR	BH203_0.1-0.2 SOIL - 9/11/2020 SE213398.006	BH203_0.6-0.7 SOIL - 9/11/2020 SE213398.007	BH204_0.2-0.3 SOIL - 9/11/2020 SE213398.008	BH205M_0.2-0.3 SOIL - 9/11/2020 SE213398.009	BH205M_1.3-1.4 SOIL - 9/11/2020 SE213398.010
% Moisture	%w/w	1	17.2	18.6	23.4	18.1	23.7

PARAMETER	UOM	LOR	BH206_0.2-0.3 SOIL - 9/11/2020 SE213398.011	BH206_0.6-0.7 SOIL - 9/11/2020 SE213398.012	BH207_0.2-0.3 SOIL - 9/11/2020 SE213398.013	BH207_0.9-1.0 SOIL - 9/11/2020 SE213398.014	BH208_0.2-0.3 SOIL - 9/11/2020 SE213398.015
% Moisture	%w/w	1	12.8	19.5	16.4	18.9	17.7

PARAMETER	UOM	LOR	BH209_0.2-0.3 SOIL - 9/11/2020 SE213398.016	BH210_0.2-0.3 SOIL - 9/11/2020 SE213398.017	BH211_0.2-0.3 SOIL - 9/11/2020 SE213398.018	BH211_0.8-0.9 SOIL - 9/11/2020 SE213398.019	BH212_0.2-0.3 SOIL - 9/11/2020 SE213398.020
% Moisture	%w/w	1	8.6	17.3	12.8	19.8	17.6

PARAMETER	UOM	LOR	QD1 SOIL - 9/11/2020 SE213398.021	QTB1 SOIL - 9/11/2020 SE213398.023
% Moisture	%w/w	1	22.3	<1.0

Fibre Identification in soil [AN602] Tested: 13/11/2020

PARAMETER	UOM	LOR	BH201M_0.5-0.6 SOIL - 9/11/2020 SE213398.001	BH202M_0.4-0.5 SOIL - 9/11/2020 SE213398.003	BH203_0.1-0.2 SOIL - 9/11/2020 SE213398.006	BH204_0.2-0.3 SOIL - 9/11/2020 SE213398.008	BH205M_0.2-0.3 SOIL - 9/11/2020 SE213398.009
Asbestos Detected	No unit	-	No	No	No	No	No
Estimated Fibres*	%w/w	0.01	<0.01	<0.01	<0.01	<0.01	<0.01

PARAMETER	UOM	LOR	BH206_0.2-0.3 SOIL - 9/11/2020 SE213398.011	BH207_0.2-0.3 SOIL - 9/11/2020 SE213398.013	BH208_0.2-0.3 SOIL - 9/11/2020 SE213398.015	BH209_0.2-0.3 SOIL - 9/11/2020 SE213398.016	BH210_0.2-0.3 SOIL - 9/11/2020 SE213398.017
Asbestos Detected	No unit	-	No	Yes	No	Yes	Yes
Estimated Fibres*	%w/w	0.01	<0.01	**>0.01**	<0.01	**>0.01**	**>0.01**

PARAMETER	UOM	LOR	BH211_0.2-0.3 SOIL - 9/11/2020 SE213398.018	BH212_0.2-0.3 SOIL - 9/11/2020 SE213398.020
Asbestos Detected	No unit	-	No	No
Estimated Fibres*	%w/w	0.01	<0.01	<0.01

VOCs in Water [AN433] Tested: 13/11/2020

PARAMETER	UOM	LOR	QR1 WATER - 9/11/2020 SE213398.022
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
o-xylene	µg/L	0.5	<0.5
Total Xylenes	µg/L	1.5	<1.5
Total BTEX	µg/L	3	<3
Naphthalene	µg/L	0.5	<0.5

Volatile Petroleum Hydrocarbons in Water [AN433] Tested: 13/11/2020

PARAMETER	UOM	LOR	QR1 WATER - 9/11/2020 SE213398.022
TRH C6-C9	µg/L	40	<40
Benzene (F0)	µg/L	0.5	<0.5
TRH C6-C10	µg/L	50	<50
TRH C6-C10 minus BTEX (F1)	µg/L	50	<50

TRH (Total Recoverable Hydrocarbons) in Water [AN403] Tested: 12/11/2020

PARAMETER	UOM	LOR	QR1 WATER - 9/11/2020 SE213398.022
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
TRH >C10-C16	µg/L	60	<60
TRH >C10-C16 - Naphthalene (F2)	µg/L	60	<60
TRH >C16-C34 (F3)	µg/L	500	<500
TRH >C34-C40 (F4)	µg/L	500	<500
TRH C10-C40	µg/L	320	<320

Trace Metals (Dissolved) in Water by ICPMS [AN318] Tested: 11/11/2020

PARAMETER	UOM	LOR	QR1 WATER - 9/11/2020 SE213398.022
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

Mercury (dissolved) in Water [AN311(Perth)/AN312] Tested: 12/11/2020

PARAMETER	UOM	LOR	QR1 WATER - 9/11/2020 SE213398.022
Mercury	mg/L	0.0001	<0.0001

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.
AN602	Qualitative identification of chrysotile, amosite and crocidolite in bulk samples by polarised light microscopy (PLM) in conjunction with dispersion staining (DS). AS4964 provides the basis for this document. Unequivocal identification of the asbestos minerals present is made by obtaining sufficient diagnostic `clues`, which provide a reasonable degree of certainty, dispersion staining is a mandatory `clue` for positive identification. If sufficient `clues` are absent, then positive identification of asbestos is not possible. This procedure requires removal of suspect fibres/bundles from the sample which cannot be returned.
AN602	Fibres/material that cannot be unequivocably identified as one of the three asbestos forms, will be reported as unknown mineral fibres (umf) The fibres detected may or may not be asbestos fibres.
AN602	AS4964.2004 Method for the Qualitative Identification of Asbestos in Bulk Samples, Section 8.4, Trace Analysis Criteria, Note 4 states:"Depending upon sample condition and fibre type, the detection limit of this technique has been found to lie generally in the range of 1 in 1,000 to 1 in 10,000 parts by weight, equivalent to 1 to 0.1 g/kg."

AN602	The sample can be reported “no asbestos found at the reporting limit of 0.1 g/kg” (<0.01%w/w) where AN602 section 4.5 of this method has been followed, and if- (a) no trace asbestos fibres have been detected (i.e. no ‘respirable’ fibres): (b) the estimated weight of non-respirable asbestos fibre bundles and/or the estimated weight of asbestos in asbestos-containing materials are found to be less than 0.1g/kg: and (c) these non-respirable asbestos fibre bundles and/or the asbestos containing materials are only visible under stereo-microscope viewing conditions.

FOOTNOTES

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

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:

a. 1 Bq is equivalent to 27 pCi
b. 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.

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Alejandra Beltran
Client	EI AUSTRALIA
Address	SUITE 6.01 55 MILLER STREET PYRMONT NSW 2009
Telephone	61 2 95160722
Facsimile	(Not specified)
Email	Alejandra.beltran@eiaustralia.com.au
Project	**E24175.E02 28 Elizabeth St. Liverpool**
Order Number	**E24175.E02**
Samples	12

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	**SE213398 R0**
Date Received	10 Nov 2020
Date Reported	17 Nov 2020

COMMENTS

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

No respirable fibres detected in all soil samples using trace analysis technique.

Sample #13: Asbestos found in approx 10x6x3mm cement sheet fragments.
Sample #16: Asbestos found in approx 10x5x3mm cement sheet fragment.
Sample #17: Asbestos found in approx 25x10x4mm cement sheet fragments.

Asbestos analysed by Approved Identifier Yusuf Kuthpudin.

SIGNATORIES

Akheeqar BENIAMEEN
Chemist

Kamrul AHSAN
Senior Chemist

Yusuf KUTHPUDIN
Asbestos Analyst

RESULTS

Fibre Identification in soil — Method AN602

Laboratory Reference	Client Reference	Matrix	Sample Description	Date Sampled	Fibre Identification	Est.%w/w*
SE213398.001	BH201M_0.5-0.6	Soil	71g Clay, Sand, Soil, Rocks	09 Nov 2020	No Asbestos Found	<0.01
SE213398.003	BH202M_0.4-0.5	Soil	213g Sand, Soil, Rocks	09 Nov 2020	No Asbestos Found	<0.01
SE213398.006	BH203_0.1-0.2	Soil	195g Clay, Sand, Soil, Rocks	09 Nov 2020	No Asbestos Found	<0.01
SE213398.008	BH204_0.2-0.3	Soil	385g Clay, Soil, Rocks	09 Nov 2020	No Asbestos Found	<0.01
SE213398.009	BH205M_0.2-0.3	Soil	170g Clay, Rocks	09 Nov 2020	No Asbestos Found	<0.01
SE213398.011	BH206_0.2-0.3	Soil	157g Clay, Soil, Rocks	09 Nov 2020	No Asbestos Found	<0.01
SE213398.013	BH207_0.2-0.3	Soil	191g Clay, Sand, Soil, Rocks	09 Nov 2020	Amosite & Chrysotile Asbestos Found Organic Fibres Detected	>0.01
SE213398.015	BH208_0.2-0.3	Soil	211g Clay, Sand, Soil, Rocks	09 Nov 2020	No Asbestos Found	<0.01
SE213398.016	BH209_0.2-0.3	Soil	221g Clay, Sand, Soil, Rocks	09 Nov 2020	Chrysotile Asbestos Found	>0.01
SE213398.017	BH210_0.2-0.3	Soil	208g Clay, Sand, Soil, Rocks	09 Nov 2020	Chrysotile Asbestos Found Organic Fibres Detected	>0.01
SE213398.018	BH211_0.2-0.3	Soil	156g Clay, Sand, Soil, Rocks	09 Nov 2020	No Asbestos Found Organic Fibres Detected	<0.01
SE213398.020	BH212_0.2-0.3	Soil	295g Clay, Sand, Soil, Rocks	09 Nov 2020	No Asbestos Found	<0.01

METHOD SUMMARY

METHOD	METHODOLOGY SUMMARY
AN602	Qualitative identification of chrysotile, amosite and crocidolite in bulk samples by polarised light microscopy (PLM) in conjunction with dispersion staining (DS). AS4964 provides the basis for this document. Unequivocal identification of the asbestos minerals present is made by obtaining sufficient diagnostic `clues`, which provide a reasonable degree of certainty, dispersion staining is a mandatory `clue` for positive identification. If sufficient `clues` are absent, then positive identification of asbestos is not possible. This procedure requires removal of suspect fibres/bundles from the sample which cannot be returned.
AN602	Fibres/material that cannot be unequivocably identified as one of the three asbestos forms, will be reported as unknown mineral fibres (umf) The fibres detected may or may not be asbestos fibres.
AN602	AS4964.2004 Method for the Qualitative Identification of Asbestos in Bulk Samples , Section 8.4, Trace Analysis Criteria, Note 4 states:"Depending upon sample condition and fibre type, the detection limit of this technique has been found to lie generally in the range of 1 in 1,000 to 1 in 10,000 parts by weight, equivalent to 1 to 0.1 g/kg."
AN602	The sample can be reported “no asbestos found at the reporting limit of 0.1 g/kg” (<0.01%w/w) where AN602 section 4.5 of this method has been followed, and if- (a) no trace asbestos fibres have been detected (i.e. no ‘respirable ’ fibres): (b) the estimated weight of non-respirable asbestos fibre bundles and/or the estimated weight of asbestos in asbestos-containing materials are found to be less than 0.1g/kg: and (c) these non-respirable asbestos fibre bundles and/or the asbestos containing materials are only visible under stereo-microscope viewing conditions.

FOOTNOTES

Amosite	-	Brown Asbestos	NA	-	Not Analysed
Chrysotile	-	White Asbestos	LNR	-	Listed, Not Required
Crocidolite	-	Blue Asbestos	*	-	NATA accreditation does not cover the performance of this service .
Amphiboles	-	Amosite and/or Crocidolite	**	-	Indicative data, theoretical holding time exceeded.
			***	-	Indicates that both * and ** apply.

(In reference to soil samples only) This report does not comply with the analytical reporting recommendations in the Western Australian Department of Health Guidelines for the Assessment and Remediation and Management of Asbestos Contaminated sites in Western Australia - May 2009.

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.

Where reported: 'Asbestos Detected': Asbestos detected by polarised light microscopy, including dispersion staining.
Where reported: 'No Asbestos Found': No Asbestos Found by polarised light microscopy , including dispersion staining.
Where reported: 'UMF Detected': Mineral fibres of unknown type detected by polarised light microscopy, including dispersion staining. Confirmation by another independent analytical technique may be necessary.

Even after disintegration it can be very difficult, or impossible, to detect the presence of asbestos in some asbestos -containing bulk materials using polarised light microscopy. This is due to the low grade or small length or diameter of asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials.

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 .

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 255405

Client Details

Client	EI Australia
Attention	Alejandra Beltran, Lab Email
Address	Suite 6.01, 55 Miller Street, Pyrmont, NSW, 2009

Sample Details

Your Reference	**E24175.E02, 28 Elizabeth St Liverpool**
Number of Samples	1 soil
Date samples received	10/11/2020
Date completed instructions received	20/11/2020

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	25/11/2020
Date of Issue	24/11/2020

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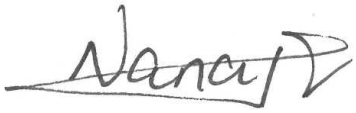
Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Dragana Tomas, Senior Chemist
Jaimie Loa-Kum-Cheung, Metals Supervisor
Manju Dewendrage, Chemist

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		255405-1
Your Reference	UNITS	QT1
Date Sampled		9/11/2020
Type of sample		soil
Date extracted	-	23/11/2020
Date analysed	-	24/11/2020
TRH C_6 - C_9	mg/kg	<25
TRH C_6 - C_{10}	mg/kg	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
naphthalene	mg/kg	<1
Total +ve Xylenes	mg/kg	<3
Surrogate aaa-Trifluorotoluene	%	103

svTRH (C10-C40) in Soil		
Our Reference		255405-1
Your Reference	UNITS	QT1
Date Sampled		9/11/2020
Type of sample		soil
Date extracted	-	23/11/2020
Date analysed	-	24/11/2020
TRH C_{10} - C_{14}	mg/kg	<50
TRH C_{15} - C_{28}	mg/kg	<100
TRH C_{29} - C_{36}	mg/kg	<100
TRH >C_{10} -C_{16}	mg/kg	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50
TRH >C_{16} -C_{34}	mg/kg	<100
TRH >C_{34} -C_{40}	mg/kg	<100
Total +ve TRH (>C10-C40)	mg/kg	<50
Surrogate o-Terphenyl	%	89

Acid Extractable metals in soil		
Our Reference		255405-1
Your Reference	UNITS	QT1
Date Sampled		9/11/2020
Type of sample		soil
Date prepared	-	23/11/2020
Date analysed	-	23/11/2020
Arsenic	mg/kg	8
Cadmium	mg/kg	<0.4
Chromium	mg/kg	17
Copper	mg/kg	15
Lead	mg/kg	19
Mercury	mg/kg	<0.1
Nickel	mg/kg	5
Zinc	mg/kg	18

Moisture		
Our Reference		255405-1
Your Reference	UNITS	QT1
Date Sampled		9/11/2020
Type of sample		soil
Date prepared	-	23/11/2020
Date analysed	-	24/11/2020
Moisture	%	23

Method ID	Methodology Summary
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			23/11/2020	[NT]	[NT]	[NT]	[NT]	23/11/2020	[NT]
Date analysed	-			24/11/2020	[NT]	[NT]	[NT]	[NT]	24/11/2020	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	105	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	105	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	[NT]	[NT]	[NT]	[NT]	105	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	[NT]	[NT]	[NT]	[NT]	101	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	106	[NT]
o-Xylene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
naphthalene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	102	[NT]	[NT]	[NT]	[NT]	103	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			23/11/2020	[NT]	[NT]	[NT]	[NT]	23/11/2020	[NT]
Date analysed	-			24/11/2020	[NT]	[NT]	[NT]	[NT]	24/11/2020	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	125	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	118	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	123	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	125	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	118	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	123	[NT]
Surrogate o-Terphenyl	%		Org-020	92	[NT]	[NT]	[NT]	[NT]	123	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			23/11/2020	1	23/11/2020	23/11/2020		23/11/2020	[NT]
Date analysed	-			23/11/2020	1	23/11/2020	23/11/2020		23/11/2020	[NT]
Arsenic	mg/kg	4	Metals-020	<4	1	8	8	0	110	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	102	[NT]
Chromium	mg/kg	1	Metals-020	<1	1	17	17	0	104	[NT]
Copper	mg/kg	1	Metals-020	<1	1	15	15	0	109	[NT]
Lead	mg/kg	1	Metals-020	<1	1	19	15	24	105	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	110	[NT]
Nickel	mg/kg	1	Metals-020	<1	1	5	5	0	109	[NT]
Zinc	mg/kg	1	Metals-020	<1	1	18	13	32	108	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Alejandra Beltran
Client	EI AUSTRALIA
Address	SUITE 6.01 55 MILLER STREET PYRMONT NSW 2009
Telephone	61 2 95160722
Facsimile	(Not specified)
Email	Alejandra.beltran@eiaustralia.com.au
Project	**E24175 28 Elizabeth St, Liverpool NSW**
Order Number	**E24175**
Samples	7

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	**SE213672 R0**
Date Received	17/11/2020
Date Reported	19/11/2020

COMMENTS

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

SIGNATORIES

Akheeqar BENIAMEEN
Chemist

Dong LIANG
Metals/Inorganics Team Leader

Kamrul AHSAN
Senior Chemist

Shane MCDERMOTT
Inorganic/Metals Chemist

VOCs in Water [AN433] Tested: 17/11/2020

PARAMETER	UOM	LOR	BH201M-1 WATER - 17/11/2020 SE213672.001	BH202M-1 WATER - 17/11/2020 SE213672.002	BH205M-1 WATER - 17/11/2020 SE213672.003	BH200_GWQD1 WATER - 17/11/2020 SE213672.004	GWQR1 WATER - 17/11/2020 SE213672.005
Benzene	µg/L	0.5	<0.5	**1.0**	<0.5	<0.5	<0.5
Toluene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	µg/L	0.5	**0.7**	<0.5	<0.5	<0.5	<0.5
m/p-xylene	µg/L	1	**1**	**2**	<1	<1	<1
o-xylene	µg/L	0.5	**0.5**	**1.1**	<0.5	<0.5	<0.5
Total Xylenes	µg/L	1.5	**1.8**	**3.3**	<1.5	<1.5	<1.5
Total BTEX	µg/L	3	<3	**4**	<3	<3	<3
Naphthalene	µg/L	0.5	**0.6**	<0.5	<0.5	<0.5	<0.5
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	**17**	<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	-	-
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	**2.5**	<0.5	-	-
MIBK (4-methyl-2-pentanone)	µg/L	5	**36**	<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	-	-
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	-	-
Bromoform (THM)	µg/L	0.5	<0.5	<0.5	<0.5	-	-
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	-	-
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	-	-

VOCs in Water [AN433] Tested: 17/11/2020 (continued)

PARAMETER	UOM	LOR	BH201M-1 WATER - 17/11/2020 SE213672.001	BH202M-1 WATER - 17/11/2020 SE213672.002	BH205M-1 WATER - 17/11/2020 SE213672.003	BH200_GWQD1 WATER - 17/11/2020 SE213672.004	GWQR1 WATER - 17/11/2020 SE213672.005
Isopropylbenzene (Cumene)	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Bromobenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
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	-	-
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 VOC	µg/L	10	**39**	**27**	<10	-	-

VOCs in Water [AN433] Tested: 17/11/2020 (continued)

PARAMETER	UOM	LOR	GWQTS1 WATER - 17/11/2020 SE213672.006	GWQTB1 WATER - 17/11/2020 SE213672.007
Benzene	µg/L	0.5	[102%]	<0.5
Toluene	µg/L	0.5	[102%]	<0.5
Ethylbenzene	µg/L	0.5	[102%]	<0.5
m/p-xylene	µg/L	1	[101%]	<1
o-xylene	µg/L	0.5	[100%]	<0.5
Total Xylenes	µg/L	1.5	-	<1.5
Total BTEX	µg/L	3	-	<3
Naphthalene	µg/L	0.5	-	<0.5
Dichlorodifluoromethane (CFC-12)	µg/L	5	-	-
Chloromethane	µg/L	5	-	-
Vinyl chloride (Chloroethene)	µg/L	0.3	-	-
Bromomethane	µg/L	10	-	-
Chloroethane	µg/L	5	-	-
Trichlorofluoromethane	µg/L	1	-	-
Acetone (2-propanone)	µg/L	10	-	-
Iodomethane	µg/L	5	-	-
1,1-dichloroethene	µg/L	0.5	-	-
Acrylonitrile	µg/L	0.5	-	-
Dichloromethane (Methylene chloride)	µg/L	5	-	-
Allyl chloride	µg/L	2	-	-
Carbon disulfide	µg/L	2	-	-
trans-1,2-dichloroethene	µg/L	0.5	-	-
MtBE (Methyl-tert-butyl ether)	µg/L	2	-	-
1,1-dichloroethane	µg/L	0.5	-	-
Vinyl acetate	µg/L	10	-	-
MEK (2-butanone)	µg/L	10	-	-
cis-1,2-dichloroethene	µg/L	0.5	-	-
Bromochloromethane	µg/L	0.5	-	-
Chloroform (THM)	µg/L	0.5	-	-
2,2-dichloropropane	µg/L	0.5	-	-
1,2-dichloroethane	µg/L	0.5	-	-
1,1,1-trichloroethane	µg/L	0.5	-	-
1,1-dichloropropene	µg/L	0.5	-	-
Carbon tetrachloride	µg/L	0.5	-	-
Dibromomethane	µg/L	0.5	-	-
1,2-dichloropropane	µg/L	0.5	-	-
Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	-	-
2-nitropropane	µg/L	100	-	-
Bromodichloromethane (THM)	µg/L	0.5	-	-
MIBK (4-methyl-2-pentanone)	µg/L	5	-	-
cis-1,3-dichloropropene	µg/L	0.5	-	-
trans-1,3-dichloropropene	µg/L	0.5	-	-
1,1,2-trichloroethane	µg/L	0.5	-	-
1,3-dichloropropane	µg/L	0.5	-	-
Dibromochloromethane (THM)	µg/L	0.5	-	-
2-hexanone (MBK)	µg/L	5	-	-
1,2-dibromoethane (EDB)	µg/L	0.5	-	-
Tetrachloroethene (Perchloroethylene,PCE)	µg/L	0.5	-	-
1,1,1,2-tetrachloroethane	µg/L	0.5	-	-
Chlorobenzene	µg/L	0.5	-	-
Bromoform (THM)	µg/L	0.5	-	-
cis-1,4-dichloro-2-butene	µg/L	1	-	-
Styrene (Vinyl benzene)	µg/L	0.5	-	-
1,1,2,2-tetrachloroethane	µg/L	0.5	-	-
1,2,3-trichloropropane	µg/L	0.5	-	-
trans-1,4-dichloro-2-butene	µg/L	1	-	-

VOCs in Water [AN433] Tested: 17/11/2020 (continued)

PARAMETER	UOM	LOR	GWQTS1 WATER - 17/11/2020 SE213672.006	GWQTB1 WATER - 17/11/2020 SE213672.007
Isopropylbenzene (Cumene)	µg/L	0.5	-	-
Bromobenzene	µg/L	0.5	-	-
n-propylbenzene	µg/L	0.5	-	-
2-chlorotoluene	µg/L	0.5	-	-
4-chlorotoluene	µg/L	0.5	-	-
1,3,5-trimethylbenzene	µg/L	0.5	-	-
tert-butylbenzene	µg/L	0.5	-	-
1,2,4-trimethylbenzene	µg/L	0.5	-	-
sec-butylbenzene	µg/L	0.5	-	-
1,3-dichlorobenzene	µg/L	0.5	-	-
1,4-dichlorobenzene	µg/L	0.3	-	-
p-isopropyltoluene	µg/L	0.5	-	-
1,2-dichlorobenzene	µg/L	0.5	-	-
n-butylbenzene	µg/L	0.5	-	-
1,2-dibromo-3-chloropropane	µg/L	0.5	-	-
1,2,4-trichlorobenzene	µg/L	0.5	-	-
Hexachlorobutadiene	µg/L	0.5	-	-
1,2,3-trichlorobenzene	µg/L	0.5	-	-
Total VOC	µg/L	10	-	-

Volatile Petroleum Hydrocarbons in Water [AN433] Tested: 17/11/2020

PARAMETER	UOM	LOR	BH201M-1 WATER - 17/11/2020 SE213672.001	BH202M-1 WATER - 17/11/2020 SE213672.002	BH205M-1 WATER - 17/11/2020 SE213672.003	BH200_GWQD1 WATER - 17/11/2020 SE213672.004	GWQR1 WATER - 17/11/2020 SE213672.005
TRH C6-C9	µg/L	40	<40	<40	<40	<40	<40
Benzene (F0)	µg/L	0.5	<0.5	**1.0**	<0.5	<0.5	<0.5
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

TRH (Total Recoverable Hydrocarbons) in Water [AN403] Tested: 18/11/2020

PARAMETER	UOM	LOR	BH201M-1 WATER - 17/11/2020 SE213672.001	BH202M-1 WATER - 17/11/2020 SE213672.002	BH205M-1 WATER - 17/11/2020 SE213672.003	BH200_GWQD1 WATER - 17/11/2020 SE213672.004	GWQR1 WATER - 17/11/2020 SE213672.005
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

PAH (Polynuclear Aromatic Hydrocarbons) in Water [AN420] Tested: 18/11/2020

PARAMETER	UOM	LOR	BH201M-1 WATER - 17/11/2020 SE213672.001	BH202M-1 WATER - 17/11/2020 SE213672.002	BH205M-1 WATER - 17/11/2020 SE213672.003
Naphthalene	µg/L	0.1	**0.2**	<0.1	<0.1
2-methylnaphthalene	µg/L	0.1	**0.3**	<0.1	<0.1
1-methylnaphthalene	µg/L	0.1	**0.2**	**0.2**	<0.1
Acenaphthylene	µg/L	0.1	<0.1	<0.1	<0.1
Acenaphthene	µg/L	0.1	<0.1	**0.9**	<0.1
Fluorene	µg/L	0.1	<0.1	**0.3**	<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	**2**	<1

Total Phenolics in Water [AN289] Tested: 18/11/2020

PARAMETER	UOM	LOR	BH201M-1 WATER - 17/11/2020 SE213672.001	BH202M-1 WATER - 17/11/2020 SE213672.002	BH205M-1 WATER - 17/11/2020 SE213672.003
Total Phenols	mg/L	0.01	**0.01**	<0.01	<0.01

Trace Metals (Dissolved) in Water by ICPMS [AN318] Tested: 17/11/2020

PARAMETER	UOM	LOR	BH201M-1 WATER - 17/11/2020 SE213672.001	BH202M-1 WATER - 17/11/2020 SE213672.002	BH205M-1 WATER - 17/11/2020 SE213672.003	BH200_GWQD1 WATER - 17/11/2020 SE213672.004	GWQR1 WATER - 17/11/2020 SE213672.005
Arsenic, As	µg/L	1	**1**	**1**	**3**	**3**	<1
Cadmium, Cd	µg/L	0.1	<0.1	<0.1	**0.1**	**0.1**	<0.1
Chromium, Cr	µg/L	1	<1	**120**	<1	<1	<1
Copper, Cu	µg/L	1	**4**	**1**	<1	<1	<1
Lead, Pb	µg/L	1	<1	<1	<1	<1	<1
Nickel, Ni	µg/L	1	**7**	**5**	**13**	**13**	<1
Zinc, Zn	µg/L	5	**17**	**51**	**63**	**54**	<5
Aluminium, Al	µg/L	5	**18**	**17**	**10**	-	-

Mercury (dissolved) in Water [AN311(Perth)/AN312] Tested: 18/11/2020

PARAMETER	UOM	LOR	BH201M-1 WATER - 17/11/2020 SE213672.001	BH202M-1 WATER - 17/11/2020 SE213672.002	BH205M-1 WATER - 17/11/2020 SE213672.003	BH200_GWQD1 WATER - 17/11/2020 SE213672.004	GWQR1 WATER - 17/11/2020 SE213672.005
Mercury	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

METHOD	METHODOLOGY SUMMARY
AN020	Unpreserved water sample is filtered through a 0.45µm membrane filter and acidified with nitric acid similar to APHA3030B.
AN289	Analysis of Total Phenols in Soil Sediment and Water: Steam distillable phenols react with 4-aminoantipyrine at pH 7.9±0.1 in the presence of potassium ferricyanide to form a coloured antipyrine dye analysed by Discrete Analyser. Reference APHA 5530 B/D.
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 Recoveerable 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.

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:

a. 1 Bq is equivalent to 27 pCi
b. 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.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 256059

Client Details

Client	EI Australia
Attention	Alejandra Beltran
Address	Suite 6.01, 55 Miller Street, Pyrmont, NSW, 2009

Sample Details

Your Reference	**E24175**
Number of Samples	1 Water
Date samples received	18/11/2020
Date completed instructions received	18/11/2020

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	20/11/2020
Date of Issue	20/11/2020

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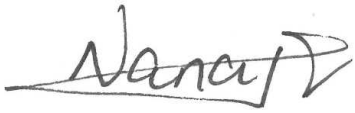
Results Approved By
Dragana Tomas, Senior Chemist
Hannah Nguyen, Senior Chemist

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Water		
Our Reference		256059-1
Your Reference	UNITS	BH200_GWQT1
Date Sampled		17/11/2020
Type of sample		Water
Date extracted	-	19/11/2020
Date analysed	-	19/11/2020
TRH C_6 - C_9	µg/L	<10
TRH C_6 - C_{10}	µg/L	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Naphthalene	µg/L	<1
Surrogate Dibromofluoromethane	%	120
Surrogate toluene-d8	%	107
Surrogate 4-BFB	%	97

svTRH (C10-C40) in Water		
Our Reference		256059-1
Your Reference	UNITS	BH200_GWQT1
Date Sampled		17/11/2020
Type of sample		Water
Date extracted	-	19/11/2020
Date analysed	-	19/11/2020
TRH C_{10} - C_{14}	µg/L	<50
TRH C_{15} - C_{28}	µg/L	<100
TRH C_{29} - C_{36}	µg/L	<100
TRH >C_{10} - C_{16}	µg/L	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50
TRH >C_{16} - C_{34}	µg/L	<100
TRH >C_{34} - C_{40}	µg/L	<100
Surrogate o-Terphenyl	%	83

HM in water - dissolved		
Our Reference		256059-1
Your Reference	UNITS	BH200_GWQT1
Date Sampled		17/11/2020
Type of sample		Water
Date prepared	-	19/11/2020
Date analysed	-	19/11/2020
Arsenic-Dissolved	µg/L	4
Cadmium-Dissolved	µg/L	0.1
Chromium-Dissolved	µg/L	<1
Copper-Dissolved	µg/L	<1
Lead-Dissolved	µg/L	<1
Mercury-Dissolved	µg/L	<0.05
Nickel-Dissolved	µg/L	15
Zinc-Dissolved	µg/L	80

Method ID	Methodology Summary
Metals-021	Determination of Mercury by Cold Vapour AAS.
Metals-022	Determination of various metals by ICP-MS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			19/11/2020	1	19/11/2020	19/11/2020		19/11/2020	[NT]
Date analysed	-			19/11/2020	1	19/11/2020	19/11/2020		19/11/2020	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	1	<10	<10	0	101	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	1	<10	<10	0	101	[NT]
Benzene	µg/L	1	Org-023	<1	1	<1	<1	0	98	[NT]
Toluene	µg/L	1	Org-023	<1	1	<1	<1	0	100	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	99	[NT]
m+p-xylene	µg/L	2	Org-023	<2	1	<2	<2	0	104	[NT]
o-xylene	µg/L	1	Org-023	<1	1	<1	<1	0	104	[NT]
Naphthalene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	114	1	120	117	3	101	[NT]
Surrogate toluene-d8	%		Org-023	104	1	107	92	15	100	[NT]
Surrogate 4-BFB	%		Org-023	99	1	97	99	2	101	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			19/11/2020	[NT]	[NT]	[NT]	[NT]	19/11/2020	[NT]
Date analysed	-			19/11/2020	[NT]	[NT]	[NT]	[NT]	19/11/2020	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	93	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	82	[NT]
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	103	[NT]
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	93	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	82	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	103	[NT]
Surrogate o-Terphenyl	%		Org-020	78	[NT]	[NT]	[NT]	[NT]	121	[NT]

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			19/11/2020	[NT]	[NT]	[NT]	[NT]	19/11/2020	[NT]
Date analysed	-			19/11/2020	[NT]	[NT]	[NT]	[NT]	19/11/2020	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	[NT]	[NT]	[NT]	[NT]	107	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

Dissolved Metals: no filtered, preserved sample was received, therefore the unpreserved sample was filtered through 0.45µm filter at the lab. Note: there is a possibility some elements may be underestimated.

Appendix H – QA/QC Assessment

H1 Quality Assurance / Quality Control Program

Quality assurance comprises an assessment of the reliability of the field procedures and laboratory results against standard industry practices and the SAQP. A summary of the project QA/QC measures incorporated into this DSI is presented in **Table H-1**.

Table H-1 Project QA Measures

Task	Description	Comments / Compliance with SOP or DQI
Field QA/QC		
General	Work was to be undertaken following standard field procedures which are based on industry accepted standard practice.	Yes.
	All fieldwork was supervised by a suitably qualified and experienced scientist or engineer.	Yes.
Soil Screening with PID	The PID was serviced and calibrated as per manufacturer requirements. PID calibrated at the beginning of each day of fieldwork.	Yes. See **Appendix E** for calibration documentation.
Equipment Decontamination	Sampling equipment to be decontaminated after the collection of each soil sample by washing with phosphate-free detergent and potable water, followed by a final distilled water rinse. One rinsate blank would be collected and analysed for the primary contaminants, with all results to be non-detect.	Yes.
Transport	Samples were stored in a chilled (with ice) cooler box and transported to the laboratories. To ensure the integrity of the samples from collection to receipt by the analytical laboratory, samples were sent by courier to the laboratories under 'chain of custody' describing sample preservation and transport duration.	Yes.
Trip Blanks	Trip blanks were to be prepared and analysed by the primary laboratory for BTEX. Analytical results for this sample to be below the laboratory LOR, indicating that ideal sample transport and handling conditions were achieved.	Yes. One trip blank sample (QTB1) was prepared by the primary laboratory (SGS) and analysed for BTEX during soil testing. Results were below the laboratory LOR, indicating that satisfactory sample transport and handling conditions were achieved (i.e. no cross-contamination occurred).

Task	Description	Comments / Compliance with SOP or DQI
Trip Spikes	Trip spike samples were to be prepared and analysed by the primary laboratory for BTEX. Recoveries to be 70-130%, indicating that satisfactory sample transport and handling conditions were achieved.	Soil trip spike sample was damaged during transport. However, EI considers that satisfactory sample transport and handling conditions were achieved due to soil trip blank sample results where analytes were below the laboratory LOR. (see above) One trip spike water sample (GWQTS1) was prepared and analysed by the primary laboratory (SGS) for BTEX. Recoveries were 72-119%, which complied with the DQI. It was therefore concluded that satisfactory sample transport and handling conditions were achieved (i.e. negligible loss of volatiles).
Duplicates	Field duplicate samples were collected and analysed as follows: ▪ intra-laboratory (blind) duplicate samples at a rate of 1 in 20 primary samples (as per NEPM); and ▪ inter-laboratory (split) duplicate samples at a rate of 1 in 20 primary samples (as per NEPM). DQI was 30% RPD, as stated by AS4482.1-2005. RPDs that exceed this threshold were considered acceptable where: ▪ Results were less than 10 times the limits of reporting (LOR); ▪ Results were less than 20 times the LOR and the RPD is less than 50%; and/or ▪ Heterogeneous materials or volatile compounds are encountered.	Yes. Field QC duplicates are identified in **Table H-2** and calculated RPDs are included in the corresponding table in **Appendix B**. The required duplicate frequency of 1 per 20 primary samples was achieved. Generally, RPDs were <30%, in compliance with the DQI, with the exception of: ▪ Arsenic (66.67%), mercury (96.55%) between sample BH201M_0.5-0.5 and QD1; and ▪ Nickel (58.06%) and zinc (71.49%) between samples BH201M_0.5-0.5 and QT1. Variabilities were due to low analyte concentrations (i.e. within 10 x LOR) and/or sample heterogeneity.
<u>Laboratory QA/QC</u>		
Laboratory Analysis	The laboratories selected are NATA accredited for the analytes selected and perform their own internal QA/QC programs.	Yes. SGS - primary laboratory. Envirolab - secondary laboratory. Laboratory QA/QC measures were included in the analytical reports (**Appendix G**). Refer also to **Appendix I**.
	Appropriate detection limits were used for the analyses to be undertaken.	Yes. Practical Quantitation Limits for all tested parameters during the DSI are presented with the laboratory reports in **Appendix G**.
Holding Times	Holding times are the maximum permissible elapsed time in days from the collection of the sample to its extraction and/or analysis. All extraction and analyses should be completed within standard guidelines.	Yes.

Task	Description	Comments / Compliance with SOP or DQI
Method Blanks	The method blank sample is laboratory prepared, containing the reagents used to prepare the sample for final analysis. The purpose of this procedure is to identify contamination in the reagent materials and assess potential bias in the sample analysis due to contaminated reagents. The QC criterion aims to find no detectable contamination in the reagents. Each analysis procedure should be subject to a method blank analysis. The results of each should indicate that contaminants were not detected.	Yes. All method blanks complied with the laboratory's DQI.
Laboratory Duplicates	Laboratory duplicates are field samples that are split in the laboratory and subsequently analysed a number of times in the same batch. These sub-samples are selected at random by the laboratory to assess the accuracy and precision of the analytical method. The selected laboratories should undertake QA/QC procedures such as calibration standards, laboratory control samples, surrogates, reference materials, sample duplicates and matrix spikes. Intra-laboratory duplicates should be performed at a frequency of 1 per 10 samples.	Yes. All laboratory duplicates were within the laboratory acceptance criteria as shown in the Laboratory DQO documents (Refer to **Appendices G** and **I**).
Laboratory Control Standard	A laboratory control standard is a standard reference material used in preparing primary standards. The concentration should be equivalent to a mid-range standard to confirm the primary calibration. Laboratory control samples should be performed on a frequency of 1 per 20 samples or at least one per analytical run.	Yes. All laboratory control samples were within acceptable ranges.
Matrix Spikes / Matrix Spike Duplicates	Matric spikes are field samples to which a predetermined stock solution of known concentration has been added. The samples are then analysed for recovery of the known addition. Recoveries should be within the stated laboratory control limits of 70 to 130% and duplicates should have RPDs of less than 50%.	Yes. All spikes were within acceptable ranges.

Task	Description	Comments / Compliance with SOP or DQI
Surrogate Spikes	Surrogate spikes provide a means of checking, for every analysis that no gross errors have occurred at any stage of the procedure leading to significant analyte loss. Recoveries should be within the stated laboratory control limits of 70 to 130%.	Partially All surrogate spikes were within acceptable ranges, with the exception of PAHs in 26 samples.
Conclusion	The QA/QC indicators should either all comply with the required standards or showed no variations that would have no significant effect on the quality of the data.	Yes. Further assessment of the investigation QA/QC is presented in the following sections.

Calculation of Relative Percent Difference (RPD)

The RPD values were calculated using the following equation:

$$RPD = \frac{|C_O - C_R|}{[(C_O + C_R)/2]} \times 100$$

Where:

C_O = Concentration obtained for the primary sample; and

C_R = Concentration obtained for the blind replicate or split duplicate sample.

H2 Field QA/QC

H2.1 Field QC Duplicates

The field duplicates collected during the investigation are identified in **Table H-2**. Analytical results for these QC samples are tabulated in **Appendix B**.

Table H-2 Field Duplicates

Matrix	Primary Sample	Blind Duplicate (Primary Lab)	Split Duplicate (Secondary Lab)	Total Duplicates
Soil	BH201M_0.5-0.6	QD1	QT1	2
Groundwater	BH205M-1	BH200_GWQD1	BH200_GWQT1	2

I2.2 Field Data Quality Indicators

A discussion of the field data quality indicators is presented in **Table H-3** below.

Table H-3 Field Data Quality Indicators

QA Component	Data Quality Indicator(s)	Conformance
Accuracy – A quantitative measure of the closeness of reported data to the "true" value	Standard operation procedures appropriate and complied with	Yes
	Calibration of instruments (PID) against known standards	Yes
	Results for inter-laboratory (split field) duplicates acceptable	Yes
Precision – A quantitative measure of the variability (or reproducibility) of data	Standard operation procedures appropriate and complied with	Yes
	Results for intra-laboratory (blind field) duplicates acceptable	Yes
Completeness – A measure of the amount of useable data from a data collection activity	Each critical location sampled	Yes
	Samples collected at targeted locations and depth	Yes
	SAQP appropriate and complied with	Yes
	Experienced sampler	Yes
	Field documentation correct	Yes
Comparability – The confidence (expressed qualitatively) that data may be considered to be equivalent for each sampling and analytical event	Same sampling method used on each occasion/location	Yes
	Experienced sampler	Yes
	Same type of samples collected (filtered, size, fractions)	Yes
Representativeness – The confidence (expressed qualitatively) that data are representative of each medium present onsite	Appropriate media sampled according to SAQP	Yes
	Each media identified in SAQP sampled	Yes
	Appropriate sample collection methodologies, handling, storage and preservation techniques used	Yes
	Consistency between field observations and laboratory results.	Yes

I2.3 Conclusion for the Field QA/QC

All field work, including equipment decontamination and sample preservation and transport, was conducted in accordance with the SAQP and SOPs, which were devised with reference to industry-approved guidelines. Appropriate QC measures were integrated into each sampling event and the DQI were met, or if not, the variability was suitably justified.

All samples, including field QC samples, were transported to the primary and secondary laboratories under refrigerated conditions, using strict COC procedures. Relevant documents (COC forms) were presented with the samples at the times of delivery. All supporting documents (COCs and SRAs) were completed in full and signed, where appropriate. Copies of these were included in **Appendix G**. EI considered the field QA/QC program carried out during the DSI to be appropriate.

H3 Laboratory QA/QC

H3.1 Laboratory Accreditation and DQIs

Primary and intra-laboratory duplicate samples were analysed by SGS (located in Alexandria NSW), with inter-laboratory duplicate samples analysed by Envirolab (located in Chatswood NSW). Both laboratories are accredited by NATA for the analyses undertaken.

Assessment of the laboratory DQIs is presented in **Table H-4** below.

Table H-4 Laboratory Data Quality Indicators

QA/QC Measure	Data Quality Indicator(s)	Conformance
Accuracy – A quantitative measure of the closeness of reported data to the "true" value	Analysis of method blanks	Yes
	Analysis of matrix spikes	Yes
	Analysis of matrix spike duplicates	Yes
	Analysis of surrogate spikes	Yes
	Analysis of laboratory control samples	Yes
Precision – A quantitative measure of the variability (or reproducibility) of data	Analysis of laboratory duplicates	Yes
Completeness – A measure of the amount of useable data from a data collection activity	All critical samples analysed according to SAQP and proposal	Yes
	All analytes analysed according to SAQP in proposal	Yes
	Appropriate methods and PQLs	Yes
	Sample documentation complete	Yes
	Sample holding times complied with	Yes
Comparability – The confidence (expressed qualitatively) that data may be considered to be equivalent for each sampling and analytical event	Same sample analytical methods used (including clean-up)	Yes
	Same Sample PQLs	Yes
	Same laboratories (NATA-accredited)	Yes
	Same units	Yes
Representativeness – The confidence (expressed qualitatively) that data are representative of each medium present onsite	All key samples analysed according to SAQP in the proposal.	Yes
	Analysis of laboratory-prepared volatile trip spikes and trip blanks	Yes

H3.2 Conclusions for the Laboratory QA/QC

All contracted laboratories (SGS and Envirolab) were accredited by NATA for the analyses undertaken. All analytical procedures used were industry recognised and endorsed standard methods. Appropriate QC measures were integrated into each testing batch and the DQI were met, or if not, the variability was suitably justified.

All final reports were submitted in full and included all requested analyses, as per the signed COC forms. EI considered the laboratory QA/QC programs carried out during the DSI to be appropriate.

H4 Summary of Project QA/QC

The project DQOs specified in **Section 5.2**, **Table 5-1** of this report were considered to have been achieved. The adopted QA/QC program ensured that the data collated during the DSI were accurate, precise and representative of the site conditions. It was therefore considered that the data were sufficiently precise and accurate and that the results could be used for DSI interpretative purposes.

Appendix I – Laboratory QA/QC and DQOs

STATEMENT OF QA/QC PERFORMANCE

SE213398 R0

CLIENT DETAILS

Contact	Alejandra Beltran
Client	EI AUSTRALIA
Address	SUITE 6.01 55 MILLER STREET PYRMONT NSW 2009
Telephone	61 2 95160722
Facsimile	(Not specified)
Email	Alejandra.beltran@eiaustralia.com.au
Project	**E24175.E02 28 Elizabeth St. Liverpool**
Order Number	**E24175.E02**
Samples	23

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	**SE213398 R0**
Date Received	10 Nov 2020
Date Reported	17 Nov 2020

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	VOC's in Soil	13 items
	Volatile Petroleum Hydrocarbons in Soil	13 items
Matrix Spike	Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES	4 items

SAMPLE SUMMARY

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	22 Soil, 1 Water
Date documentation received	10/11/2020	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	8.3°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

HOLDING TIME SUMMARY

SE213398 R0

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 sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Fibre Identification in soil

Method: ME-(AU)-[ENV]AN602

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH201M_0.5-0.6	SE213398.001	LB213376	09 Nov 2020	10 Nov 2020	09 Nov 2021	13 Nov 2020	09 Nov 2021	17 Nov 2020
BH202M_0.4-0.5	SE213398.003	LB213376	09 Nov 2020	10 Nov 2020	09 Nov 2021	13 Nov 2020	09 Nov 2021	17 Nov 2020
BH203_0.1-0.2	SE213398.006	LB213376	09 Nov 2020	10 Nov 2020	09 Nov 2021	13 Nov 2020	09 Nov 2021	17 Nov 2020
BH204_0.2-0.3	SE213398.008	LB213376	09 Nov 2020	10 Nov 2020	09 Nov 2021	13 Nov 2020	09 Nov 2021	17 Nov 2020
BH205M_0.2-0.3	SE213398.009	LB213376	09 Nov 2020	10 Nov 2020	09 Nov 2021	13 Nov 2020	09 Nov 2021	17 Nov 2020
BH206_0.2-0.3	SE213398.011	LB213376	09 Nov 2020	10 Nov 2020	09 Nov 2021	13 Nov 2020	09 Nov 2021	17 Nov 2020
BH207_0.2-0.3	SE213398.013	LB213376	09 Nov 2020	10 Nov 2020	09 Nov 2021	13 Nov 2020	09 Nov 2021	17 Nov 2020
BH208_0.2-0.3	SE213398.015	LB213376	09 Nov 2020	10 Nov 2020	09 Nov 2021	13 Nov 2020	09 Nov 2021	17 Nov 2020
BH209_0.2-0.3	SE213398.016	LB213376	09 Nov 2020	10 Nov 2020	09 Nov 2021	13 Nov 2020	09 Nov 2021	17 Nov 2020
BH210_0.2-0.3	SE213398.017	LB213376	09 Nov 2020	10 Nov 2020	09 Nov 2021	13 Nov 2020	09 Nov 2021	17 Nov 2020
BH211_0.2-0.3	SE213398.018	LB213376	09 Nov 2020	10 Nov 2020	09 Nov 2021	13 Nov 2020	09 Nov 2021	17 Nov 2020
BH212_0.2-0.3	SE213398.020	LB213376	09 Nov 2020	10 Nov 2020	09 Nov 2021	13 Nov 2020	09 Nov 2021	17 Nov 2020

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
QR1	SE213398.022	LB213235	09 Nov 2020	10 Nov 2020	07 Dec 2020	12 Nov 2020	07 Dec 2020	16 Nov 2020

Mercury in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH201M_0.5-0.6	SE213398.001	LB213205	09 Nov 2020	10 Nov 2020	07 Dec 2020	11 Nov 2020	07 Dec 2020	13 Nov 2020
BH201M_1.2-1.3	SE213398.002	LB213205	09 Nov 2020	10 Nov 2020	07 Dec 2020	11 Nov 2020	07 Dec 2020	13 Nov 2020
BH202M_0.4-0.5	SE213398.003	LB213205	09 Nov 2020	10 Nov 2020	07 Dec 2020	11 Nov 2020	07 Dec 2020	13 Nov 2020
BH202M_3.9-4.0	SE213398.005	LB213205	09 Nov 2020	10 Nov 2020	07 Dec 2020	11 Nov 2020	07 Dec 2020	13 Nov 2020
BH203_0.1-0.2	SE213398.006	LB213205	09 Nov 2020	10 Nov 2020	07 Dec 2020	11 Nov 2020	07 Dec 2020	13 Nov 2020
BH203_0.6-0.7	SE213398.007	LB213205	09 Nov 2020	10 Nov 2020	07 Dec 2020	11 Nov 2020	07 Dec 2020	13 Nov 2020
BH204_0.2-0.3	SE213398.008	LB213205	09 Nov 2020	10 Nov 2020	07 Dec 2020	11 Nov 2020	07 Dec 2020	13 Nov 2020
BH205M_0.2-0.3	SE213398.009	LB213205	09 Nov 2020	10 Nov 2020	07 Dec 2020	11 Nov 2020	07 Dec 2020	13 Nov 2020
BH205M_1.3-1.4	SE213398.010	LB213205	09 Nov 2020	10 Nov 2020	07 Dec 2020	11 Nov 2020	07 Dec 2020	13 Nov 2020
BH206_0.2-0.3	SE213398.011	LB213205	09 Nov 2020	10 Nov 2020	07 Dec 2020	11 Nov 2020	07 Dec 2020	13 Nov 2020
BH206_0.6-0.7	SE213398.012	LB213205	09 Nov 2020	10 Nov 2020	07 Dec 2020	11 Nov 2020	07 Dec 2020	13 Nov 2020
BH207_0.2-0.3	SE213398.013	LB213205	09 Nov 2020	10 Nov 2020	07 Dec 2020	11 Nov 2020	07 Dec 2020	13 Nov 2020
BH207_0.9-1.0	SE213398.014	LB213205	09 Nov 2020	10 Nov 2020	07 Dec 2020	11 Nov 2020	07 Dec 2020	13 Nov 2020
BH208_0.2-0.3	SE213398.015	LB213205	09 Nov 2020	10 Nov 2020	07 Dec 2020	11 Nov 2020	07 Dec 2020	13 Nov 2020
BH209_0.2-0.3	SE213398.016	LB213205	09 Nov 2020	10 Nov 2020	07 Dec 2020	11 Nov 2020	07 Dec 2020	13 Nov 2020
BH210_0.2-0.3	SE213398.017	LB213205	09 Nov 2020	10 Nov 2020	07 Dec 2020	11 Nov 2020	07 Dec 2020	13 Nov 2020
BH211_0.2-0.3	SE213398.018	LB213205	09 Nov 2020	10 Nov 2020	07 Dec 2020	11 Nov 2020	07 Dec 2020	13 Nov 2020
BH211_0.8-0.9	SE213398.019	LB213205	09 Nov 2020	10 Nov 2020	07 Dec 2020	11 Nov 2020	07 Dec 2020	13 Nov 2020
BH212_0.2-0.3	SE213398.020	LB213249	09 Nov 2020	10 Nov 2020	07 Dec 2020	12 Nov 2020	07 Dec 2020	13 Nov 2020
QD1	SE213398.021	LB213249	09 Nov 2020	10 Nov 2020	07 Dec 2020	12 Nov 2020	07 Dec 2020	13 Nov 2020

Moisture Content

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH201M_0.5-0.6	SE213398.001	LB213195	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	16 Nov 2020	13 Nov 2020
BH201M_1.2-1.3	SE213398.002	LB213195	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	16 Nov 2020	13 Nov 2020
BH202M_0.4-0.5	SE213398.003	LB213195	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	16 Nov 2020	13 Nov 2020
BH202M_2.4-2.5	SE213398.004	LB213195	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	16 Nov 2020	13 Nov 2020
BH202M_3.9-4.0	SE213398.005	LB213195	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	16 Nov 2020	13 Nov 2020
BH203_0.1-0.2	SE213398.006	LB213195	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	16 Nov 2020	13 Nov 2020
BH203_0.6-0.7	SE213398.007	LB213195	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	16 Nov 2020	13 Nov 2020
BH204_0.2-0.3	SE213398.008	LB213195	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	16 Nov 2020	13 Nov 2020
BH205M_0.2-0.3	SE213398.009	LB213195	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	16 Nov 2020	13 Nov 2020
BH205M_1.3-1.4	SE213398.010	LB213195	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	16 Nov 2020	13 Nov 2020
BH206_0.2-0.3	SE213398.011	LB213195	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	16 Nov 2020	13 Nov 2020
BH206_0.6-0.7	SE213398.012	LB213195	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	16 Nov 2020	13 Nov 2020
BH207_0.2-0.3	SE213398.013	LB213195	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	16 Nov 2020	13 Nov 2020
BH207_0.9-1.0	SE213398.014	LB213195	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	16 Nov 2020	13 Nov 2020
BH208_0.2-0.3	SE213398.015	LB213195	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	16 Nov 2020	13 Nov 2020
BH209_0.2-0.3	SE213398.016	LB213195	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	16 Nov 2020	13 Nov 2020
BH210_0.2-0.3	SE213398.017	LB213195	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	16 Nov 2020	13 Nov 2020
BH211_0.2-0.3	SE213398.018	LB213195	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	16 Nov 2020	13 Nov 2020

HOLDING TIME SUMMARY

SE213398 R0

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 sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Moisture Content (continued)

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH211_0.8-0.9	SE213398.019	LB213195	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	16 Nov 2020	13 Nov 2020
BH212_0.2-0.3	SE213398.020	LB213195	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	16 Nov 2020	13 Nov 2020
QD1	SE213398.021	LB213195	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	16 Nov 2020	13 Nov 2020
QTB1	SE213398.023	LB213195	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	16 Nov 2020	13 Nov 2020

OC Pesticides in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH201M_0.5-0.6	SE213398.001	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH201M_1.2-1.3	SE213398.002	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH202M_0.4-0.5	SE213398.003	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH202M_2.4-2.5	SE213398.004	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH202M_3.9-4.0	SE213398.005	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH203_0.1-0.2	SE213398.006	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH203_0.6-0.7	SE213398.007	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH204_0.2-0.3	SE213398.008	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH205M_0.2-0.3	SE213398.009	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH205M_1.3-1.4	SE213398.010	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH206_0.2-0.3	SE213398.011	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH206_0.6-0.7	SE213398.012	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH207_0.2-0.3	SE213398.013	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH207_0.9-1.0	SE213398.014	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH208_0.2-0.3	SE213398.015	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH209_0.2-0.3	SE213398.016	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH210_0.2-0.3	SE213398.017	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH211_0.2-0.3	SE213398.018	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH211_0.8-0.9	SE213398.019	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH212_0.2-0.3	SE213398.020	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
QD1	SE213398.021	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020

OP Pesticides in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH201M_0.5-0.6	SE213398.001	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH201M_1.2-1.3	SE213398.002	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH202M_0.4-0.5	SE213398.003	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH202M_2.4-2.5	SE213398.004	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH202M_3.9-4.0	SE213398.005	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH203_0.1-0.2	SE213398.006	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH203_0.6-0.7	SE213398.007	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH204_0.2-0.3	SE213398.008	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH205M_0.2-0.3	SE213398.009	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH205M_1.3-1.4	SE213398.010	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH206_0.2-0.3	SE213398.011	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH206_0.6-0.7	SE213398.012	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH207_0.2-0.3	SE213398.013	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH207_0.9-1.0	SE213398.014	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH208_0.2-0.3	SE213398.015	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH209_0.2-0.3	SE213398.016	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH210_0.2-0.3	SE213398.017	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH211_0.2-0.3	SE213398.018	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH211_0.8-0.9	SE213398.019	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH212_0.2-0.3	SE213398.020	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
QD1	SE213398.021	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020

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
BH201M_0.5-0.6	SE213398.001	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH201M_1.2-1.3	SE213398.002	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH202M_0.4-0.5	SE213398.003	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH202M_2.4-2.5	SE213398.004	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	17 Nov 2020
BH202M_3.9-4.0	SE213398.005	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH203_0.1-0.2	SE213398.006	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020

HOLDING TIME SUMMARY

SE213398 R0

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 sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH203_0.6-0.7	SE213398.007	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH204_0.2-0.3	SE213398.008	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH205M_0.2-0.3	SE213398.009	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH205M_1.3-1.4	SE213398.010	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH206_0.2-0.3	SE213398.011	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH206_0.6-0.7	SE213398.012	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH207_0.2-0.3	SE213398.013	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH207_0.9-1.0	SE213398.014	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH208_0.2-0.3	SE213398.015	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH209_0.2-0.3	SE213398.016	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH210_0.2-0.3	SE213398.017	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH211_0.2-0.3	SE213398.018	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH211_0.8-0.9	SE213398.019	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH212_0.2-0.3	SE213398.020	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
QD1	SE213398.021	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	17 Nov 2020

PCBs in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH201M_0.5-0.6	SE213398.001	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH201M_1.2-1.3	SE213398.002	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH202M_0.4-0.5	SE213398.003	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH202M_2.4-2.5	SE213398.004	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH202M_3.9-4.0	SE213398.005	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH203_0.1-0.2	SE213398.006	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH203_0.6-0.7	SE213398.007	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH204_0.2-0.3	SE213398.008	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH205M_0.2-0.3	SE213398.009	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH205M_1.3-1.4	SE213398.010	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH206_0.2-0.3	SE213398.011	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH206_0.6-0.7	SE213398.012	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH207_0.2-0.3	SE213398.013	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH207_0.9-1.0	SE213398.014	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH208_0.2-0.3	SE213398.015	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH209_0.2-0.3	SE213398.016	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH210_0.2-0.3	SE213398.017	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH211_0.2-0.3	SE213398.018	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH211_0.8-0.9	SE213398.019	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH212_0.2-0.3	SE213398.020	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
QD1	SE213398.021	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020

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
BH201M_0.5-0.6	SE213398.001	LB213201	09 Nov 2020	10 Nov 2020	08 May 2021	11 Nov 2020	08 May 2021	13 Nov 2020
BH201M_1.2-1.3	SE213398.002	LB213201	09 Nov 2020	10 Nov 2020	08 May 2021	11 Nov 2020	08 May 2021	13 Nov 2020
BH202M_0.4-0.5	SE213398.003	LB213201	09 Nov 2020	10 Nov 2020	08 May 2021	11 Nov 2020	08 May 2021	13 Nov 2020
BH202M_2.4-2.5	SE213398.004	LB213201	09 Nov 2020	10 Nov 2020	08 May 2021	11 Nov 2020	08 May 2021	13 Nov 2020
BH202M_3.9-4.0	SE213398.005	LB213201	09 Nov 2020	10 Nov 2020	08 May 2021	11 Nov 2020	08 May 2021	13 Nov 2020
BH203_0.1-0.2	SE213398.006	LB213201	09 Nov 2020	10 Nov 2020	08 May 2021	11 Nov 2020	08 May 2021	13 Nov 2020
BH203_0.6-0.7	SE213398.007	LB213201	09 Nov 2020	10 Nov 2020	08 May 2021	11 Nov 2020	08 May 2021	13 Nov 2020
BH204_0.2-0.3	SE213398.008	LB213201	09 Nov 2020	10 Nov 2020	08 May 2021	11 Nov 2020	08 May 2021	13 Nov 2020
BH205M_0.2-0.3	SE213398.009	LB213201	09 Nov 2020	10 Nov 2020	08 May 2021	11 Nov 2020	08 May 2021	13 Nov 2020
BH205M_1.3-1.4	SE213398.010	LB213201	09 Nov 2020	10 Nov 2020	08 May 2021	11 Nov 2020	08 May 2021	13 Nov 2020
BH206_0.2-0.3	SE213398.011	LB213201	09 Nov 2020	10 Nov 2020	08 May 2021	11 Nov 2020	08 May 2021	13 Nov 2020
BH206_0.6-0.7	SE213398.012	LB213201	09 Nov 2020	10 Nov 2020	08 May 2021	11 Nov 2020	08 May 2021	13 Nov 2020
BH207_0.2-0.3	SE213398.013	LB213201	09 Nov 2020	10 Nov 2020	08 May 2021	11 Nov 2020	08 May 2021	13 Nov 2020
BH207_0.9-1.0	SE213398.014	LB213201	09 Nov 2020	10 Nov 2020	08 May 2021	11 Nov 2020	08 May 2021	13 Nov 2020
BH208_0.2-0.3	SE213398.015	LB213201	09 Nov 2020	10 Nov 2020	08 May 2021	11 Nov 2020	08 May 2021	13 Nov 2020
BH209_0.2-0.3	SE213398.016	LB213201	09 Nov 2020	10 Nov 2020	08 May 2021	11 Nov 2020	08 May 2021	13 Nov 2020
BH210_0.2-0.3	SE213398.017	LB213201	09 Nov 2020	10 Nov 2020	08 May 2021	11 Nov 2020	08 May 2021	13 Nov 2020
BH211_0.2-0.3	SE213398.018	LB213201	09 Nov 2020	10 Nov 2020	08 May 2021	11 Nov 2020	08 May 2021	13 Nov 2020
BH211_0.8-0.9	SE213398.019	LB213201	09 Nov 2020	10 Nov 2020	08 May 2021	11 Nov 2020	08 May 2021	13 Nov 2020

HOLDING TIME SUMMARY

SE213398 R0

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 sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES (continued)

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH212_0.2-0.3	SE213398.020	LB213247	09 Nov 2020	10 Nov 2020	08 May 2021	12 Nov 2020	08 May 2021	13 Nov 2020
QD1	SE213398.021	LB213247	09 Nov 2020	10 Nov 2020	08 May 2021	12 Nov 2020	08 May 2021	13 Nov 2020

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
QR1	SE213398.022	LB213170	09 Nov 2020	10 Nov 2020	08 May 2021	11 Nov 2020	08 May 2021	11 Nov 2020

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
BH201M_0.5-0.6	SE213398.001	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH201M_1.2-1.3	SE213398.002	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH202M_0.4-0.5	SE213398.003	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH202M_2.4-2.5	SE213398.004	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH202M_3.9-4.0	SE213398.005	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH203_0.1-0.2	SE213398.006	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH203_0.6-0.7	SE213398.007	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH204_0.2-0.3	SE213398.008	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH205M_0.2-0.3	SE213398.009	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH205M_1.3-1.4	SE213398.010	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH206_0.2-0.3	SE213398.011	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH206_0.6-0.7	SE213398.012	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH207_0.2-0.3	SE213398.013	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH207_0.9-1.0	SE213398.014	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH208_0.2-0.3	SE213398.015	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH209_0.2-0.3	SE213398.016	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH210_0.2-0.3	SE213398.017	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH211_0.2-0.3	SE213398.018	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH211_0.8-0.9	SE213398.019	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
BH212_0.2-0.3	SE213398.020	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020
QD1	SE213398.021	LB213192	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	13 Nov 2020

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
QR1	SE213398.022	LB213233	09 Nov 2020	10 Nov 2020	16 Nov 2020	12 Nov 2020	22 Dec 2020	16 Nov 2020

VOC's in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH201M_0.5-0.6	SE213398.001	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH201M_1.2-1.3	SE213398.002	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH202M_0.4-0.5	SE213398.003	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH202M_2.4-2.5	SE213398.004	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH202M_3.9-4.0	SE213398.005	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH203_0.1-0.2	SE213398.006	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH203_0.6-0.7	SE213398.007	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH204_0.2-0.3	SE213398.008	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH205M_0.2-0.3	SE213398.009	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH205M_1.3-1.4	SE213398.010	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH206_0.2-0.3	SE213398.011	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH206_0.6-0.7	SE213398.012	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH207_0.2-0.3	SE213398.013	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH207_0.9-1.0	SE213398.014	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH208_0.2-0.3	SE213398.015	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH209_0.2-0.3	SE213398.016	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH210_0.2-0.3	SE213398.017	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH211_0.2-0.3	SE213398.018	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH211_0.8-0.9	SE213398.019	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH212_0.2-0.3	SE213398.020	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
QD1	SE213398.021	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
QTB1	SE213398.023	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020

HOLDING TIME SUMMARY

SE213398 R0

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 sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

VOCs in Water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QR1	SE213398.022	LB213329	09 Nov 2020	10 Nov 2020	16 Nov 2020	13 Nov 2020	23 Dec 2020	16 Nov 2020

Volatile Petroleum Hydrocarbons in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH201M_0.5-0.6	SE213398.001	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH201M_1.2-1.3	SE213398.002	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH202M_0.4-0.5	SE213398.003	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH202M_2.4-2.5	SE213398.004	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH202M_3.9-4.0	SE213398.005	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH203_0.1-0.2	SE213398.006	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH203_0.6-0.7	SE213398.007	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH204_0.2-0.3	SE213398.008	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH205M_0.2-0.3	SE213398.009	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH205M_1.3-1.4	SE213398.010	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH206_0.2-0.3	SE213398.011	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH206_0.6-0.7	SE213398.012	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH207_0.2-0.3	SE213398.013	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH207_0.9-1.0	SE213398.014	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH208_0.2-0.3	SE213398.015	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH209_0.2-0.3	SE213398.016	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH210_0.2-0.3	SE213398.017	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH211_0.2-0.3	SE213398.018	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH211_0.8-0.9	SE213398.019	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
BH212_0.2-0.3	SE213398.020	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
QD1	SE213398.021	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	16 Nov 2020
QTB1	SE213398.023	LB213190	09 Nov 2020	10 Nov 2020	23 Nov 2020	11 Nov 2020	21 Dec 2020	17 Nov 2020

Volatile Petroleum Hydrocarbons in Water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QR1	SE213398.022	LB213329	09 Nov 2020	10 Nov 2020	16 Nov 2020	13 Nov 2020	23 Dec 2020	16 Nov 2020

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 identifer 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)	BH201M_0.5-0.6	SE213398.001	%	60 - 130%	113
	BH202M_0.4-0.5	SE213398.003	%	60 - 130%	105
	BH203_0.1-0.2	SE213398.006	%	60 - 130%	104
	BH204_0.2-0.3	SE213398.008	%	60 - 130%	105
	BH205M_0.2-0.3	SE213398.009	%	60 - 130%	102
	BH206_0.2-0.3	SE213398.011	%	60 - 130%	118
	BH207_0.2-0.3	SE213398.013	%	60 - 130%	105
	BH208_0.2-0.3	SE213398.015	%	60 - 130%	106
	BH209_0.2-0.3	SE213398.016	%	60 - 130%	101
	BH210_0.2-0.3	SE213398.017	%	60 - 130%	105
	BH211_0.2-0.3	SE213398.018	%	60 - 130%	105
	BH212_0.2-0.3	SE213398.020	%	60 - 130%	106

OP Pesticides in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	BH201M_0.5-0.6	SE213398.001	%	60 - 130%	110
	BH202M_0.4-0.5	SE213398.003	%	60 - 130%	108
	BH203_0.1-0.2	SE213398.006	%	60 - 130%	110
	BH204_0.2-0.3	SE213398.008	%	60 - 130%	108
	BH205M_0.2-0.3	SE213398.009	%	60 - 130%	110
	BH206_0.2-0.3	SE213398.011	%	60 - 130%	106
	BH207_0.2-0.3	SE213398.013	%	60 - 130%	108
	BH208_0.2-0.3	SE213398.015	%	60 - 130%	108
	BH209_0.2-0.3	SE213398.016	%	60 - 130%	90
	BH210_0.2-0.3	SE213398.017	%	60 - 130%	108
	BH211_0.2-0.3	SE213398.018	%	60 - 130%	108
	BH212_0.2-0.3	SE213398.020	%	60 - 130%	108
d14-p-terphenyl (Surrogate)	BH201M_0.5-0.6	SE213398.001	%	60 - 130%	106
	BH202M_0.4-0.5	SE213398.003	%	60 - 130%	104
	BH203_0.1-0.2	SE213398.006	%	60 - 130%	106
	BH204_0.2-0.3	SE213398.008	%	60 - 130%	104
	BH205M_0.2-0.3	SE213398.009	%	60 - 130%	104
	BH206_0.2-0.3	SE213398.011	%	60 - 130%	104
	BH207_0.2-0.3	SE213398.013	%	60 - 130%	106
	BH208_0.2-0.3	SE213398.015	%	60 - 130%	106
	BH209_0.2-0.3	SE213398.016	%	60 - 130%	90
	BH210_0.2-0.3	SE213398.017	%	60 - 130%	106
	BH211_0.2-0.3	SE213398.018	%	60 - 130%	106
	BH212_0.2-0.3	SE213398.020	%	60 - 130%	106

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	BH201M_0.5-0.6	SE213398.001	%	70 - 130%	110
	BH201M_1.2-1.3	SE213398.002	%	70 - 130%	108
	BH202M_0.4-0.5	SE213398.003	%	70 - 130%	108
	BH202M_3.9-4.0	SE213398.005	%	70 - 130%	108
	BH203_0.1-0.2	SE213398.006	%	70 - 130%	110
	BH203_0.6-0.7	SE213398.007	%	70 - 130%	110
	BH204_0.2-0.3	SE213398.008	%	70 - 130%	108
	BH205M_0.2-0.3	SE213398.009	%	70 - 130%	110
	BH205M_1.3-1.4	SE213398.010	%	70 - 130%	108
	BH206_0.2-0.3	SE213398.011	%	70 - 130%	106
	BH206_0.6-0.7	SE213398.012	%	70 - 130%	108
	BH207_0.2-0.3	SE213398.013	%	70 - 130%	108
	BH207_0.9-1.0	SE213398.014	%	70 - 130%	106
	BH208_0.2-0.3	SE213398.015	%	70 - 130%	108
	BH209_0.2-0.3	SE213398.016	%	70 - 130%	90
	BH210_0.2-0.3	SE213398.017	%	70 - 130%	108
	BH211_0.2-0.3	SE213398.018	%	70 - 130%	108
	BH211_0.8-0.9	SE213398.019	%	70 - 130%	108
	BH212_0.2-0.3	SE213398.020	%	70 - 130%	108
d14-p-terphenyl (Surrogate)	BH201M_0.5-0.6	SE213398.001	%	70 - 130%	106

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 identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
d14-p-terphenyl (Surrogate)	BH201M_1.2-1.3	SE213398.002	%	70 - 130%	106
	BH202M_0.4-0.5	SE213398.003	%	70 - 130%	104
	BH202M_3.9-4.0	SE213398.005	%	70 - 130%	104
	BH203_0.1-0.2	SE213398.006	%	70 - 130%	106
	BH203_0.6-0.7	SE213398.007	%	70 - 130%	106
	BH204_0.2-0.3	SE213398.008	%	70 - 130%	104
	BH205M_0.2-0.3	SE213398.009	%	70 - 130%	104
	BH205M_1.3-1.4	SE213398.010	%	70 - 130%	84
	BH206_0.2-0.3	SE213398.011	%	70 - 130%	104
	BH206_0.6-0.7	SE213398.012	%	70 - 130%	104
	BH207_0.2-0.3	SE213398.013	%	70 - 130%	106
	BH207_0.9-1.0	SE213398.014	%	70 - 130%	100
	BH208_0.2-0.3	SE213398.015	%	70 - 130%	106
	BH209_0.2-0.3	SE213398.016	%	70 - 130%	90
	BH210_0.2-0.3	SE213398.017	%	70 - 130%	106
	BH211_0.2-0.3	SE213398.018	%	70 - 130%	106
	BH211_0.8-0.9	SE213398.019	%	70 - 130%	104
	BH212_0.2-0.3	SE213398.020	%	70 - 130%	106
d5-nitrobenzene (Surrogate)	BH201M_0.5-0.6	SE213398.001	%	70 - 130%	102
	BH201M_1.2-1.3	SE213398.002	%	70 - 130%	98
	BH202M_0.4-0.5	SE213398.003	%	70 - 130%	98
	BH202M_3.9-4.0	SE213398.005	%	70 - 130%	96
	BH203_0.1-0.2	SE213398.006	%	70 - 130%	98
	BH203_0.6-0.7	SE213398.007	%	70 - 130%	100
	BH204_0.2-0.3	SE213398.008	%	70 - 130%	96
	BH205M_0.2-0.3	SE213398.009	%	70 - 130%	98
	BH205M_1.3-1.4	SE213398.010	%	70 - 130%	96
	BH206_0.2-0.3	SE213398.011	%	70 - 130%	96
	BH206_0.6-0.7	SE213398.012	%	70 - 130%	96
	BH207_0.2-0.3	SE213398.013	%	70 - 130%	98
	BH207_0.9-1.0	SE213398.014	%	70 - 130%	92
	BH208_0.2-0.3	SE213398.015	%	70 - 130%	92
	BH209_0.2-0.3	SE213398.016	%	70 - 130%	82
	BH210_0.2-0.3	SE213398.017	%	70 - 130%	96
	BH211_0.2-0.3	SE213398.018	%	70 - 130%	94
	BH211_0.8-0.9	SE213398.019	%	70 - 130%	96
	BH212_0.2-0.3	SE213398.020	%	70 - 130%	92

PCBs in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	BH201M_0.5-0.6	SE213398.001	%	60 - 130%	113
	BH202M_0.4-0.5	SE213398.003	%	60 - 130%	105
	BH203_0.1-0.2	SE213398.006	%	60 - 130%	104
	BH204_0.2-0.3	SE213398.008	%	60 - 130%	105
	BH205M_0.2-0.3	SE213398.009	%	60 - 130%	102
	BH206_0.2-0.3	SE213398.011	%	60 - 130%	118
	BH207_0.2-0.3	SE213398.013	%	60 - 130%	105
	BH208_0.2-0.3	SE213398.015	%	60 - 130%	106
	BH209_0.2-0.3	SE213398.016	%	60 - 130%	101
	BH210_0.2-0.3	SE213398.017	%	60 - 130%	105
	BH211_0.2-0.3	SE213398.018	%	60 - 130%	105
	BH212_0.2-0.3	SE213398.020	%	60 - 130%	106

VOC's in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH201M_0.5-0.6	SE213398.001	%	60 - 130%	68
	BH201M_1.2-1.3	SE213398.002	%	60 - 130%	67
	BH202M_0.4-0.5	SE213398.003	%	60 - 130%	61
	BH202M_2.4-2.5	SE213398.004	%	60 - 130%	57 ①
	BH202M_3.9-4.0	SE213398.005	%	60 - 130%	64
	BH203_0.1-0.2	SE213398.006	%	60 - 130%	62
	BH203_0.6-0.7	SE213398.007	%	60 - 130%	59 ①

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 identifer 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**

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH204_0.2-0.3	SE213398.008	%	60 - 130%	61
	BH205M_0.2-0.3	SE213398.009	%	60 - 130%	60 ①
	BH205M_1.3-1.4	SE213398.010	%	60 - 130%	60
	BH206_0.2-0.3	SE213398.011	%	60 - 130%	58 ①
	BH206_0.6-0.7	SE213398.012	%	60 - 130%	59 ①
	BH207_0.2-0.3	SE213398.013	%	60 - 130%	57 ①
	BH207_0.9-1.0	SE213398.014	%	60 - 130%	59 ①
	BH208_0.2-0.3	SE213398.015	%	60 - 130%	60
	BH209_0.2-0.3	SE213398.016	%	60 - 130%	59 ①
	BH210_0.2-0.3	SE213398.017	%	60 - 130%	54 ①
	BH211_0.2-0.3	SE213398.018	%	60 - 130%	56 ①
	BH211_0.8-0.9	SE213398.019	%	60 - 130%	57 ①
	BH212_0.2-0.3	SE213398.020	%	60 - 130%	60 ①
	QD1	SE213398.021	%	60 - 130%	57 ①
	QTB1	SE213398.023	%	60 - 130%	87
d4-1,2-dichloroethane (Surrogate)	BH201M_0.5-0.6	SE213398.001	%	60 - 130%	83
	BH201M_1.2-1.3	SE213398.002	%	60 - 130%	85
	BH202M_0.4-0.5	SE213398.003	%	60 - 130%	80
	BH202M_2.4-2.5	SE213398.004	%	60 - 130%	75
	BH202M_3.9-4.0	SE213398.005	%	60 - 130%	85
	BH203_0.1-0.2	SE213398.006	%	60 - 130%	84
	BH203_0.6-0.7	SE213398.007	%	60 - 130%	81
	BH204_0.2-0.3	SE213398.008	%	60 - 130%	85
	BH205M_0.2-0.3	SE213398.009	%	60 - 130%	83
	BH205M_1.3-1.4	SE213398.010	%	60 - 130%	83
	BH206_0.2-0.3	SE213398.011	%	60 - 130%	83
	BH206_0.6-0.7	SE213398.012	%	60 - 130%	83
	BH207_0.2-0.3	SE213398.013	%	60 - 130%	82
	BH207_0.9-1.0	SE213398.014	%	60 - 130%	85
	BH208_0.2-0.3	SE213398.015	%	60 - 130%	85
	BH209_0.2-0.3	SE213398.016	%	60 - 130%	83
	BH210_0.2-0.3	SE213398.017	%	60 - 130%	79
	BH211_0.2-0.3	SE213398.018	%	60 - 130%	81
	BH211_0.8-0.9	SE213398.019	%	60 - 130%	82
	BH212_0.2-0.3	SE213398.020	%	60 - 130%	86
	QD1	SE213398.021	%	60 - 130%	83
	QTB1	SE213398.023	%	60 - 130%	91
d8-toluene (Surrogate)	BH201M_0.5-0.6	SE213398.001	%	60 - 130%	83
	BH201M_1.2-1.3	SE213398.002	%	60 - 130%	85
	BH202M_0.4-0.5	SE213398.003	%	60 - 130%	79
	BH202M_2.4-2.5	SE213398.004	%	60 - 130%	75
	BH202M_3.9-4.0	SE213398.005	%	60 - 130%	85
	BH203_0.1-0.2	SE213398.006	%	60 - 130%	83
	BH203_0.6-0.7	SE213398.007	%	60 - 130%	80
	BH204_0.2-0.3	SE213398.008	%	60 - 130%	84
	BH205M_0.2-0.3	SE213398.009	%	60 - 130%	82
	BH205M_1.3-1.4	SE213398.010	%	60 - 130%	84
	BH206_0.2-0.3	SE213398.011	%	60 - 130%	83
	BH206_0.6-0.7	SE213398.012	%	60 - 130%	84
	BH207_0.2-0.3	SE213398.013	%	60 - 130%	81
	BH207_0.9-1.0	SE213398.014	%	60 - 130%	86
	BH208_0.2-0.3	SE213398.015	%	60 - 130%	85
	BH209_0.2-0.3	SE213398.016	%	60 - 130%	84
	BH210_0.2-0.3	SE213398.017	%	60 - 130%	78
	BH211_0.2-0.3	SE213398.018	%	60 - 130%	80
	BH211_0.8-0.9	SE213398.019	%	60 - 130%	82
	BH212_0.2-0.3	SE213398.020	%	60 - 130%	86
	QD1	SE213398.021	%	60 - 130%	84
	QTB1	SE213398.023	%	60 - 130%	91

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 identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

VOCs in Water

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	QR1	SE213398.022	%	40 - 130%	105
d4-1,2-dichloroethane (Surrogate)	QR1	SE213398.022	%	40 - 130%	96
d8-toluene (Surrogate)	QR1	SE213398.022	%	40 - 130%	98

Volatile Petroleum Hydrocarbons in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH201M_0.5-0.6	SE213398.001	%	60 - 130%	68
	BH201M_1.2-1.3	SE213398.002	%	60 - 130%	67
	BH202M_0.4-0.5	SE213398.003	%	60 - 130%	61
	BH202M_2.4-2.5	SE213398.004	%	60 - 130%	57 ①
	BH202M_3.9-4.0	SE213398.005	%	60 - 130%	64
	BH203_0.1-0.2	SE213398.006	%	60 - 130%	62
	BH203_0.6-0.7	SE213398.007	%	60 - 130%	59 ①
	BH204_0.2-0.3	SE213398.008	%	60 - 130%	61
	BH205M_0.2-0.3	SE213398.009	%	60 - 130%	60 ①
	BH205M_1.3-1.4	SE213398.010	%	60 - 130%	60
	BH206_0.2-0.3	SE213398.011	%	60 - 130%	58 ①
	BH206_0.6-0.7	SE213398.012	%	60 - 130%	59 ①
	BH207_0.2-0.3	SE213398.013	%	60 - 130%	57 ①
	BH207_0.9-1.0	SE213398.014	%	60 - 130%	59 ①
	BH208_0.2-0.3	SE213398.015	%	60 - 130%	60
	BH209_0.2-0.3	SE213398.016	%	60 - 130%	59 ①
	BH210_0.2-0.3	SE213398.017	%	60 - 130%	54 ①
	BH211_0.2-0.3	SE213398.018	%	60 - 130%	56 ①
	BH211_0.8-0.9	SE213398.019	%	60 - 130%	57 ①
	BH212_0.2-0.3	SE213398.020	%	60 - 130%	60 ①
	QD1	SE213398.021	%	60 - 130%	57 ①
d4-1,2-dichloroethane (Surrogate)	BH201M_0.5-0.6	SE213398.001	%	60 - 130%	83
	BH201M_1.2-1.3	SE213398.002	%	60 - 130%	85
	BH202M_0.4-0.5	SE213398.003	%	60 - 130%	80
	BH202M_2.4-2.5	SE213398.004	%	60 - 130%	75
	BH202M_3.9-4.0	SE213398.005	%	60 - 130%	85
	BH203_0.1-0.2	SE213398.006	%	60 - 130%	84
	BH203_0.6-0.7	SE213398.007	%	60 - 130%	81
	BH204_0.2-0.3	SE213398.008	%	60 - 130%	85
	BH205M_0.2-0.3	SE213398.009	%	60 - 130%	83
	BH205M_1.3-1.4	SE213398.010	%	60 - 130%	83
	BH206_0.2-0.3	SE213398.011	%	60 - 130%	83
	BH206_0.6-0.7	SE213398.012	%	60 - 130%	83
	BH207_0.2-0.3	SE213398.013	%	60 - 130%	82
	BH207_0.9-1.0	SE213398.014	%	60 - 130%	85
	BH208_0.2-0.3	SE213398.015	%	60 - 130%	85
	BH209_0.2-0.3	SE213398.016	%	60 - 130%	83
	BH210_0.2-0.3	SE213398.017	%	60 - 130%	79
	BH211_0.2-0.3	SE213398.018	%	60 - 130%	81
	BH211_0.8-0.9	SE213398.019	%	60 - 130%	82
	BH212_0.2-0.3	SE213398.020	%	60 - 130%	86
	QD1	SE213398.021	%	60 - 130%	83
d8-toluene (Surrogate)	BH201M_0.5-0.6	SE213398.001	%	60 - 130%	83
	BH201M_1.2-1.3	SE213398.002	%	60 - 130%	85
	BH202M_0.4-0.5	SE213398.003	%	60 - 130%	79
	BH202M_2.4-2.5	SE213398.004	%	60 - 130%	75
	BH202M_3.9-4.0	SE213398.005	%	60 - 130%	85
	BH203_0.1-0.2	SE213398.006	%	60 - 130%	83
	BH203_0.6-0.7	SE213398.007	%	60 - 130%	80
	BH204_0.2-0.3	SE213398.008	%	60 - 130%	84
	BH205M_0.2-0.3	SE213398.009	%	60 - 130%	82
	BH205M_1.3-1.4	SE213398.010	%	60 - 130%	84
	BH206_0.2-0.3	SE213398.011	%	60 - 130%	83
	BH206_0.6-0.7	SE213398.012	%	60 - 130%	84
	BH207_0.2-0.3	SE213398.013	%	60 - 130%	81

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 identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Volatile Petroleum Hydrocarbons in Soil (continued)

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
d8-toluene (Surrogate)	BH207_0.9-1.0	SE213398.014	%	60 - 130%	86
	BH208_0.2-0.3	SE213398.015	%	60 - 130%	85
	BH209_0.2-0.3	SE213398.016	%	60 - 130%	84
	BH210_0.2-0.3	SE213398.017	%	60 - 130%	78
	BH211_0.2-0.3	SE213398.018	%	60 - 130%	80
	BH211_0.8-0.9	SE213398.019	%	60 - 130%	82
	BH212_0.2-0.3	SE213398.020	%	60 - 130%	86
	QD1	SE213398.021	%	60 - 130%	84

Volatile Petroleum Hydrocarbons in Water

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	QR1	SE213398.022	%	40 - 130%	105
d4-1,2-dichloroethane (Surrogate)	QR1	SE213398.022	%	60 - 130%	96
d8-toluene (Surrogate)	QR1	SE213398.022	%	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.

Mercury (dissolved) in Water

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

Sample Number	Parameter	Units	LOR	Result
LB213235.001	Mercury	mg/L	0.0001	<0.0001

Mercury in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB213205.001	Mercury	mg/kg	0.05	<0.05
LB213249.001	Mercury	mg/kg	0.05	<0.05

OC Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB213192.001		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)	%	-	92

OP Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB213192.001		Dichlorvos	mg/kg	0.5	<0.5
		Dimethoate	mg/kg	0.5	<0.5
		Diazinon (Dimpylate)	mg/kg	0.5	<0.5
		Fenitrothion	mg/kg	0.2	<0.2
		Malathion	mg/kg	0.2	<0.2
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2
		Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2
		Bromophos Ethyl	mg/kg	0.2	<0.2
		Methidathion	mg/kg	0.5	<0.5
		Ethion	mg/kg	0.2	<0.2
		Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2
	Surrogates	2-fluorobiphenyl (Surrogate)	%	-	112
		d14-p-terphenyl (Surrogate)	%	-	108

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB213192.001	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

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.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

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

Sample Number		Parameter	Units	LOR	Result
LB213192.001		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)	%	-	108
		2-fluorobiphenyl (Surrogate)	%	-	112
		d14-p-terphenyl (Surrogate)	%	-	108

PCBs in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB213192.001		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)	%	-	92

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

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

Sample Number	Parameter	Units	LOR	Result
LB213201.001	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
LB213247.001	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
LB213170.001	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 Soil

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

Sample Number	Parameter	Units	LOR	Result
LB213192.001	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

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.

TRH (Total Recoverable Hydrocarbons) in Water

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

Sample Number		Parameter	Units	LOR	Result
LB213233.001		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

VOC's in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB213190.001	Monocyclic Aromatic	Benzene	mg/kg	0.1	<0.1
	Hydrocarbons	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)	%	-	92
		d8-toluene (Surrogate)	%	-	90
		Bromofluorobenzene (Surrogate)	%	-	77
	Totals	Total BTEX	mg/kg	0.6	<0.6

VOCs in Water

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

Sample Number		Parameter	Units	LOR	Result
LB213329.001	Monocyclic Aromatic	Benzene	µg/L	0.5	<0.5
	Hydrocarbons	Toluene	µg/L	0.5	<0.5
		Ethylbenzene	µg/L	0.5	<0.5
		m/p-xylene	µg/L	1	<1
		o-xylene	µg/L	0.5	<0.5
	Polycyclic VOCs	Naphthalene	µg/L	0.5	<0.5
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	95
		d8-toluene (Surrogate)	%	-	96
		Bromofluorobenzene (Surrogate)	%	-	102

Volatile Petroleum Hydrocarbons in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB213190.001		TRH C6-C9	mg/kg	20	<20
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	92

Volatile Petroleum Hydrocarbons in Water

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

Sample Number		Parameter	Units	LOR	Result
LB213329.001		TRH C6-C9	µg/L	40	<40
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	95
		d8-toluene (Surrogate)	%	-	96
		Bromofluorobenzene (Surrogate)	%	-	102

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / 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 x SDL / Mean + 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 identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Mercury (dissolved) in Water

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE213457.015	LB213235.012	Mercury	µg/L	0.0001	0.00962	-0.0008	200	198

Mercury in Soil

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE213398.011	LB213205.014	Mercury	mg/kg	0.05	0.20	0.16	58	22
SE213398.019	LB213205.023	Mercury	mg/kg	0.05	<0.05	<0.05	200	0
SE213418.001	LB213249.014	Mercury	mg/kg	0.05	0.0019261916	0.0008659475	200	0
SE213418.008	LB213249.022	Mercury	mg/kg	0.05	0.0011226664	0.0013667980	200	0

Moisture Content

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE213398.010	LB213195.011	% Moisture	%w/w	1	23.7	22.0	34	8
SE213398.020	LB213195.022	% Moisture	%w/w	1	17.6	17.3	36	2

OC Pesticides in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE213398.020	LB213192.028		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	3

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE213398.010	LB213192.014	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Acenaphthylene	mg/kg	0.1	<0.1	<0.1	200	0
		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	<0.1	<0.1	200	0
		Anthracene	mg/kg	0.1	<0.1	<0.1	200	0
		Fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
		Pyrene	mg/kg	0.1	<0.1	<0.1	200	0
		Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	200	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / 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 x SDL / Mean + 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 identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE213398.010	LB213192.014		Chrysene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=0	mg/kg	0.2	<0.2	<0.2	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	mg/kg	0.3	<0.3	<0.3	134	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	mg/kg	0.2	<0.2	<0.2	175	0
			Total PAH (18)	mg/kg	0.8	<0.8	<0.8	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	30	2
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.6	30	2
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	2

PCBs in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE213398.020	LB213192.028		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	3

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

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE213398.010	LB213201.014	Arsenic, As	mg/kg	1	9	9	41	3
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.5	15	17	33	14
		Copper, Cu	mg/kg	0.5	9.0	7.8	36	15
		Nickel, Ni	mg/kg	0.5	1.6	1.5	62	3
		Lead, Pb	mg/kg	1	12	12	39	3
		Zinc, Zn	mg/kg	2	11	11	48	1
SE213398.019	LB213201.024	Arsenic, As	mg/kg	1	4	5	51	21
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.5	12	13	34	7
		Copper, Cu	mg/kg	0.5	8.9	9.4	35	5
		Nickel, Ni	mg/kg	0.5	2.7	2.6	49	3
		Lead, Pb	mg/kg	1	8	11	41	24
		Zinc, Zn	mg/kg	2	11	12	48	13
SE213418.001	LB213247.014	Arsenic, As	mg/kg	1	4.2450749844	4.37812224	53	3
		Cadmium, Cd	mg/kg	0.3	0.0353576585	0.03297024	200	0
		Chromium, Cr	mg/kg	0.5	12.1181906920	13.7213184	34	12
		Copper, Cu	mg/kg	0.5	5.1354843133	5.03996928	40	2
		Nickel, Ni	mg/kg	0.5	6.0211505417	6.27614976	38	4
		Lead, Pb	mg/kg	1	5.8460870126	5.8023552	47	1
		Zinc, Zn	mg/kg	2	21.7932534144	18.26958336	40	18
SE213418.008	LB213247.022	Arsenic, As	mg/kg	1	5.0218938267	4.2357866956	52	17
		Cadmium, Cd	mg/kg	0.3	0.0520597717	0.0176730434	200	0
		Chromium, Cr	mg/kg	0.5	12.4435348944	1.6226770434	34	7
		Copper, Cu	mg/kg	0.5	4.7919978745	4.1580253043	41	14
		Nickel, Ni	mg/kg	0.5	7.0526414051	5.5603813043	38	24
		Lead, Pb	mg/kg	1	7.0734653138	5.7706905217	46	20
		Zinc, Zn	mg/kg	2	19.4091323610	17.1181099130	41	13

Trace Metals (Dissolved) in Water by ICPMS

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

Original	Duplicate	Parameter	Units	LOR

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / 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 x SDL / Mean + 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 identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Trace Metals (Dissolved) in Water by ICPMS (continued)

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE213403.004	LB213170.008		Copper, Cu	µg/L	1	1.584	1.593	78	1
			Zinc, Zn	µg/L	5	1.002	1.065	200	0

TRH (Total Recoverable Hydrocarbons) in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE213398.010	LB213192.014		TRH C10-C14	mg/kg	20	<20	<20	200	0
			TRH C15-C28	mg/kg	45	<45	<45	200	0
			TRH C29-C36	mg/kg	45	<45	<45	200	0
			TRH C37-C40	mg/kg	100	<100	<100	200	0
			TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
			TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	200	0
		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	<90	<90	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0
SE213398.021	LB213192.029		TRH C10-C14	mg/kg	20	<20	<20	200	0
			TRH C15-C28	mg/kg	45	<45	<45	200	0
			TRH C29-C36	mg/kg	45	<45	<45	200	0
			TRH C37-C40	mg/kg	100	<100	<100	200	0
			TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
			TRH >C10-C40 Total (F bands)	mg/kg	210	<210	<210	200	0
		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	<90	<90	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0

VOC's in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE213398.010	LB213190.015	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
		Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			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	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.3	8.1	50	3
			d8-toluene (Surrogate)	mg/kg	-	8.4	8.2	50	2
			Bromofluorobenzene (Surrogate)	mg/kg	-	6.0	5.8	50	4
		Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	0
SE213398.021	LB213190.033	Monocyclic	Benzene	mg/kg	0.1	<0.1	0	200	0
		Aromatic	Toluene	mg/kg	0.1	<0.1	0.0021158895	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	0.0006512652	200	0
			m/p-xylene	mg/kg	0.2	<0.2	0.0016785890	200	0
			o-xylene	mg/kg	0.1	<0.1	0.0006655412	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	0.0028702356	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.3	8.4182668437	50	2
			d8-toluene (Surrogate)	mg/kg	-	8.4	8.4582559620	50	1
			Bromofluorobenzene (Surrogate)	mg/kg	-	5.7	5.7105089106	50	0
		Totals	Total Xylenes	mg/kg	0.3	<0.3	0.0023441303	200	0
			Total BTEX	mg/kg	0.6	<0.6	0	200	0

VOCs in Water

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE213453.009	LB213329.022	Monocyclic	Benzene	µg/L	0.5	0.0559189887	0.053299569	200	0
		Aromatic	Toluene	µg/L	0.5	0.1682021047	0.155734626	200	0
			Ethylbenzene	µg/L	0.5	0.0263619727	0.021022708	200	0
			m/p-xylene	µg/L	1	0.0743772083	0.056326342	200	0
			o-xylene	µg/L	0.5	0.0326663039	0.024711951	200	0
		Polycyclic	Naphthalene	µg/L	0.5	0.0629089300	0.026736799	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	9.6520585826	9.422369602	30	2
			d8-toluene (Surrogate)	µg/L	-	9.7809303416	9.708826041	30	1

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / 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 x SDL / Mean + 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 identifer 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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE213453.009	LB213329.022	Surrogates	Bromofluorobenzene (Surrogate)	µg/L	-	10.5651039574	10.72761314	30	2

Volatile Petroleum Hydrocarbons in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE213398.010	LB213190.015		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	-	8.3	8.1	30	3
			d8-toluene (Surrogate)	mg/kg	-	8.4	8.2	30	2
			Bromofluorobenzene (Surrogate)	mg/kg	-	6.0	5.8	30	4
		VPH 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
SE213398.021	LB213190.033		TRH C6-C10	mg/kg	25	<25	0	200	0
			TRH C6-C9	mg/kg	20	<20	0	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.3	8.4182668437	30	2
			d8-toluene (Surrogate)	mg/kg	-	8.4	8.4582559620	30	1
			Bromofluorobenzene (Surrogate)	mg/kg	-	5.7	5.7105089106	30	0
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	0	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	0	200	0

Volatile Petroleum Hydrocarbons in Water

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE213453.009	LB213329.022		TRH C6-C10	µg/L	50	0	0	200	0
			TRH C6-C9	µg/L	40	0	0	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	9.6520585826	9.422369602	30	2
			d8-toluene (Surrogate)	µg/L	-	9.7809303416	9.708826041	30	1
			Bromofluorobenzene (Surrogate)	µg/L	-	10.5651039574	10.72761314	30	2
		VPH F Bands	Benzene (F0)	µg/L	0.5	0.0559189887	0.053299569	200	0
			TRH C6-C10 minus BTEX (F1)	µg/L	50	0	0	200	0
SE213472.001	LB213329.023	Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	9.7090899023	9.634814693	30	1
			d8-toluene (Surrogate)	µg/L	-	9.7716067580	9.790352509	30	0
			Bromofluorobenzene (Surrogate)	µg/L	-	10.7105839555	10.7546799	30	0
		VPH F Bands	Benzene (F0)	µg/L	0.5	0	0	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 %
LB213205.002	Mercury	mg/kg	0.05	0.20	0.2	70 - 130	102
LB213249.002	Mercury	mg/kg	0.05	0.20	0.2	70 - 130	100

OC Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB213192.002		Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	98
		Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	89
		Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	87
		Dieldrin	mg/kg	0.2	<0.2	0.2	60 - 140	85
		Endrin	mg/kg	0.2	<0.2	0.2	60 - 140	87
		p,p'-DDT	mg/kg	0.1	0.1	0.2	60 - 140	75
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.14	0.15	40 - 130	92

OP Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB213192.002		Dichlorvos	mg/kg	0.5	2.2	2	60 - 140	112
		Diazinon (Dimpylate)	mg/kg	0.5	2.5	2	60 - 140	124
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	2.4	2	60 - 140	120
		Ethion	mg/kg	0.2	1.9	2	60 - 140	96
	Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.6	0.5	40 - 130	110
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	102

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB213192.002		Naphthalene	mg/kg	0.1	4.5	4	60 - 140	113
		Acenaphthylene	mg/kg	0.1	4.6	4	60 - 140	114
		Acenaphthene	mg/kg	0.1	4.4	4	60 - 140	110
		Phenanthrene	mg/kg	0.1	4.5	4	60 - 140	112
		Anthracene	mg/kg	0.1	4.6	4	60 - 140	114
		Fluoranthene	mg/kg	0.1	4.5	4	60 - 140	112
		Pyrene	mg/kg	0.1	4.6	4	60 - 140	114
		Benzo(a)pyrene	mg/kg	0.1	3.8	4	60 - 140	94
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	100
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.6	0.5	40 - 130	110
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	102

PCBs in Soil

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB213192.002	Arochlor 1260	mg/kg	0.2	0.4	0.4	60 - 140	110

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 %
LB213201.002	Arsenic, As	mg/kg	1	330	318.22	80 - 120	102
	Cadmium, Cd	mg/kg	0.3	4.6	5.41	80 - 120	85
	Chromium, Cr	mg/kg	0.5	38	38.31	80 - 120	100
	Copper, Cu	mg/kg	0.5	300	290	80 - 120	102
	Nickel, Ni	mg/kg	0.5	190	187	80 - 120	102
	Lead, Pb	mg/kg	1	94	89.9	80 - 120	105
	Zinc, Zn	mg/kg	2	270	273	80 - 120	99
LB213247.002	Arsenic, As	mg/kg	1	330	318.22	80 - 120	104
	Cadmium, Cd	mg/kg	0.3	5.1	5.41	80 - 120	94
	Chromium, Cr	mg/kg	0.5	35	38.31	80 - 120	92
	Copper, Cu	mg/kg	0.5	300	290	80 - 120	103
	Nickel, Ni	mg/kg	0.5	190	187	80 - 120	101
	Lead, Pb	mg/kg	1	96	89.9	80 - 120	107
	Zinc, Zn	mg/kg	2	270	273	80 - 120	100

Trace Metals (Dissolved) in Water by ICPMS

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

Sample Number	Parameter	Units	LOR

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 (continued)

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB213170.002		Arsenic, As	µg/L	1	18	20	80 - 120	91
		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	22	20	80 - 120	109
		Lead, Pb	µg/L	1	19	20	80 - 120	95
		Nickel, Ni	µg/L	1	21	20	80 - 120	103
		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	Result	Expected	Criteria %	Recovery %
LB213192.002		TRH C10-C14	mg/kg	20	37	40	60 - 140	93
		TRH C15-C28	mg/kg	45	<45	40	60 - 140	85
		TRH C29-C36	mg/kg	45	<45	40	60 - 140	80
	TRH F Bands	TRH >C10-C16	mg/kg	25	37	40	60 - 140	93
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	85
		TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	80

TRH (Total Recoverable Hydrocarbons) in Water

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB213233.002		TRH C10-C14	µg/L	50	1300	1200	60 - 140	104
		TRH C15-C28	µg/L	200	1400	1200	60 - 140	118
		TRH C29-C36	µg/L	200	1300	1200	60 - 140	109
	TRH F Bands	TRH >C10-C16	µg/L	60	1300	1200	60 - 140	110
		TRH >C16-C34 (F3)	µg/L	500	1400	1200	60 - 140	120
		TRH >C34-C40 (F4)	µg/L	500	620	600	60 - 140	103

VOC's in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB213190.002	Monocyclic Aromatic	Benzene	mg/kg	0.1	3.7	5	60 - 140	73
		Toluene	mg/kg	0.1	3.7	5	60 - 140	74
		Ethylbenzene	mg/kg	0.1	4.0	5	60 - 140	81
		m/p-xylene	mg/kg	0.2	8.1	10	60 - 140	81
		o-xylene	mg/kg	0.1	4.1	5	60 - 140	81
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.8	10	70 - 130	98
		d8-toluene (Surrogate)	mg/kg	-	9.7	10	70 - 130	97
		Bromofluorobenzene (Surrogate)	mg/kg	-	8.7	10	70 - 130	87

VOCs in Water

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB213329.002	Monocyclic Aromatic	Benzene	µg/L	0.5	51	45.45	60 - 140	113
		Toluene	µg/L	0.5	51	45.45	60 - 140	112
		Ethylbenzene	µg/L	0.5	51	45.45	60 - 140	111
		m/p-xylene	µg/L	1	100	90.9	60 - 140	111
		o-xylene	µg/L	0.5	52	45.45	60 - 140	114
	Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.3	10	60 - 140	103
		d8-toluene (Surrogate)	µg/L	-	10.6	10	70 - 130	106
		Bromofluorobenzene (Surrogate)	µg/L	-	10.1	10	70 - 130	101

Volatile Petroleum Hydrocarbons in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB213190.002		TRH C6-C10	mg/kg	25	82	92.5	60 - 140	89
		TRH C6-C9	mg/kg	20	70	80	60 - 140	88
	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	9.8	10	70 - 130	98
		Bromofluorobenzene (Surrogate)	mg/kg	-	8.7	10	70 - 130	87
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	59	62.5	60 - 140	94

Volatile Petroleum Hydrocarbons in Water

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB213329.002		TRH C6-C10	µg/L	50	930	946.63	60 - 140	98
		TRH C6-C9	µg/L	40	800	818.71	60 - 140	98
	Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.3	10	60 - 140	103
		d8-toluene (Surrogate)	µg/L	-	10.6	10	70 - 130	106
		Bromofluorobenzene (Surrogate)	µg/L	-	10.1	10	70 - 130	101
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	µg/L	50	620	639.67	60 - 140	97

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 identifer 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%
SE213456.001	LB213249.004	Mercury	mg/kg	0.05	0.19	<0.05	0.2	83

OC Pesticides in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Original	Spike	Recovery%
SE213398.003	LB213192.030		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	0.2	107
			Aldrin	mg/kg	0.1	<0.1	0.2	98
			Beta BHC	mg/kg	0.1	<0.1	-	-
			Delta BHC	mg/kg	0.1	<0.1	0.2	102
			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	0.2	92
			Endrin	mg/kg	0.2	<0.2	0.2	94
			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	0.2	81
			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	-	-
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.16	-	106

OP Pesticides in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Original	Spike	Recovery%
SE213398.003	LB213192.030		Dichlorvos	mg/kg	0.5	<0.5	2	94
			Dimethoate	mg/kg	0.5	<0.5	-	-
			Diazinon (Dimpylate)	mg/kg	0.5	<0.5	2	113
			Fenitrothion	mg/kg	0.2	<0.2	-	-
			Malathion	mg/kg	0.2	<0.2	-	-
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	2	104
			Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	-	-
			Bromophos Ethyl	mg/kg	0.2	<0.2	-	-
			Methidathion	mg/kg	0.5	<0.5	-	-
			Ethion	mg/kg	0.2	<0.2	2	82
			Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	-	-
			Total OP Pesticides*	mg/kg	1.7	<1.7	-	-
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	-	108
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	-	96

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR	Original	Spike	Recovery%
SE213398.003	LB213192.030	Naphthalene	mg/kg	0.1	<0.1	4	110
		2-methylnaphthalene	mg/kg	0.1	<0.1	-	-
		1-methylnaphthalene	mg/kg	0.1	<0.1	-	-
		Acenaphthylene	mg/kg	0.1	<0.1	4	108
		Acenaphthene	mg/kg	0.1	<0.1	4	106
		Fluorene	mg/kg	0.1	<0.1	-	-
		Phenanthrene	mg/kg	0.1	<0.1	4	107

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 identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

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

QC Sample	Sample Number		Parameter	Units	LOR	Original	Spike	Recovery%
SE213398.003	LB213192.030		Anthracene	mg/kg	0.1	<0.1	4	111
			Fluoranthene	mg/kg	0.1	<0.1	4	103
			Pyrene	mg/kg	0.1	<0.1	4	109
			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	86
			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	-	94
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	-	108
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	-	96

PCBs in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Original	Spike	Recovery%
SE213398.003	LB213192.030		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	0.4	87
			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)	mg/kg	-	0	-	105

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%
SE213398.001	LB213201.004	Arsenic, As	mg/kg	1	47	8	50	78
		Cadmium, Cd	mg/kg	0.3	38	<0.3	50	76
		Chromium, Cr	mg/kg	0.5	55	17	50	77
		Copper, Cu	mg/kg	0.5	54	13	50	81
		Nickel, Ni	mg/kg	0.5	46	4.3	50	84
		Lead, Pb	mg/kg	1	62	16	50	92
		Zinc, Zn	mg/kg	2	62	17	50	90
SE213456.001	LB213247.004	Arsenic, As	mg/kg	1	40	3	50	73
		Cadmium, Cd	mg/kg	0.3	38	<0.3	50	76
		Chromium, Cr	mg/kg	0.5	59	26	50	66 ④
		Copper, Cu	mg/kg	0.5	240	220	50	46 ④
		Nickel, Ni	mg/kg	0.5	50	12	50	75
		Lead, Pb	mg/kg	1	70	36	50	67 ④
		Zinc, Zn	mg/kg	2	230	240	50	-11 ④

Trace Metals (Dissolved) in Water by ICPMS

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE213398.022	LB213170.004	Arsenic, As	µg/L	1	19	<1	20	96
		Cadmium, Cd	µg/L	0.1	21	<0.1	20	107
		Chromium, Cr	µg/L	1	22	<1	20	111
		Copper, Cu	µg/L	1	23	<1	20	113
		Lead, Pb	µg/L	1	20	<1	20	99
		Nickel, Ni	µg/L	1	22	<1	20	108
		Zinc, Zn	µg/L	5	25	<5	20	117

TRH (Total Recoverable Hydrocarbons) in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR

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 identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

TRH (Total Recoverable Hydrocarbons) in Soil (continued)

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

QC Sample	Sample Number		Parameter	Units	LOR	Original	Spike	Recovery%
SE213398.003	LB213192.030		TRH C10-C14	mg/kg	20	<20	40	123
			TRH C15-C28	mg/kg	45	<45	40	108
			TRH C29-C36	mg/kg	45	<45	40	88
			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 F Bands	TRH >C10-C16	mg/kg	25	<25	40	120
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	-	-
			TRH >C16-C34 (F3)	mg/kg	90	<90	40	100
			TRH >C34-C40 (F4)	mg/kg	120	<120	-	-

VOC's in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE213398.001	LB213190.004	Monocyclic	Benzene	mg/kg	0.1	3.5	<0.1	5	70
		Aromatic	Toluene	mg/kg	0.1	3.6	<0.1	5	71
			Ethylbenzene	mg/kg	0.1	3.9	<0.1	5	78
			m/p-xylene	mg/kg	0.2	8.0	<0.2	10	80
			o-xylene	mg/kg	0.1	4.0	<0.1	5	80
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.5	8.3	10	85
			d8-toluene (Surrogate)	mg/kg	-	8.6	8.3	10	86
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.2	6.8	10	72
		Totals	Total Xylenes	mg/kg	0.3	12	<0.3	-	-
			Total BTEX	mg/kg	0.6	23	<0.6	-	-

VOCs in Water

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE213398.022	LB213329.026	Monocyclic	Benzene	µg/L	0.5	49	<0.5	45.45	109
		Aromatic	Toluene	µg/L	0.5	49	<0.5	45.45	107
			Ethylbenzene	µg/L	0.5	49	<0.5	45.45	108
			m/p-xylene	µg/L	1	98	<1	90.9	108
			o-xylene	µg/L	0.5	50	<0.5	45.45	110
		Polycyclic	Naphthalene	µg/L	0.5	49	<0.5	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.1	9.6	-	101
			d8-toluene (Surrogate)	µg/L	-	10.4	9.8	-	104
			Bromofluorobenzene (Surrogate)	µg/L	-	10.2	10.5	-	102

Volatile Petroleum Hydrocarbons in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE213398.001	LB213190.005		TRH C6-C10	mg/kg	25	79	<25	92.5	84
			TRH C6-C9	mg/kg	20	68	<20	80	84
		Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	8.5	8.3	10	85
			d8-toluene (Surrogate)	mg/kg	-	8.6	8.3	10	86
			Bromofluorobenzene (Surrogate)	mg/kg	-	7.2	6.8	-	72
		VPH F	Benzene (F0)	mg/kg	0.1	3.5	<0.1	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	56	<25	62.5	88

Volatile Petroleum Hydrocarbons in Water

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE213398.022	LB213329.026		TRH C6-C10	µg/L	50	940	<50	946.63	99
			TRH C6-C9	µg/L	40	820	<40	818.71	100
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	0.0	9.6	-	102
			d8-toluene (Surrogate)	µg/L	-	0.0	9.8	-	104
			Bromofluorobenzene (Surrogate)	µg/L	-	0.0	10.5	-	102
		VPH F	Benzene (F0)	µg/L	0.5		<0.5	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	µg/L	50	640	<50	639.67	100

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / 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 x SDL / Mean + 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 identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

QC Sample	Sample Number	Parameter	Units	LOR

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.

STATEMENT OF QA/QC PERFORMANCE

SE213672 R0

CLIENT DETAILS

Contact	Alejandra Beltran
Client	EI AUSTRALIA
Address	SUITE 6.01 55 MILLER STREET PYRMONT NSW 2009
Telephone	61 2 95160722
Facsimile	(Not specified)
Email	Alejandra.beltran@eiaustralia.com.au
Project	**E24175 28 Elizabeth St, Liverpool NSW**
Order Number	**E24175**
Samples	7

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	**SE213672 R0**
Date Received	17 Nov 2020
Date Reported	19 Nov 2020

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

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	7 Water
Date documentation received	17/11/2020	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	18°C	Sufficient sample for analysis	Yes
Turnaround time requested	Two Days		

HOLDING TIME SUMMARY

SE213672 R0

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 sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

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
BH201M-1	SE213672.001	LB213636	17 Nov 2020	17 Nov 2020	15 Dec 2020	18 Nov 2020	15 Dec 2020	18 Nov 2020
BH202M-1	SE213672.002	LB213636	17 Nov 2020	17 Nov 2020	15 Dec 2020	18 Nov 2020	15 Dec 2020	18 Nov 2020
BH205M-1	SE213672.003	LB213636	17 Nov 2020	17 Nov 2020	15 Dec 2020	18 Nov 2020	15 Dec 2020	18 Nov 2020
BH200_GWQD1	SE213672.004	LB213636	17 Nov 2020	17 Nov 2020	15 Dec 2020	18 Nov 2020	15 Dec 2020	18 Nov 2020
GWQR1	SE213672.005	LB213636	17 Nov 2020	17 Nov 2020	15 Dec 2020	18 Nov 2020	15 Dec 2020	18 Nov 2020

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
BH201M-1	SE213672.001	LB213633	17 Nov 2020	17 Nov 2020	24 Nov 2020	18 Nov 2020	28 Dec 2020	19 Nov 2020
BH202M-1	SE213672.002	LB213633	17 Nov 2020	17 Nov 2020	24 Nov 2020	18 Nov 2020	28 Dec 2020	19 Nov 2020
BH205M-1	SE213672.003	LB213633	17 Nov 2020	17 Nov 2020	24 Nov 2020	18 Nov 2020	28 Dec 2020	19 Nov 2020
BH200_GWQD1	SE213672.004	LB213633	17 Nov 2020	17 Nov 2020	24 Nov 2020	18 Nov 2020	28 Dec 2020	19 Nov 2020
GWQR1	SE213672.005	LB213633	17 Nov 2020	17 Nov 2020	24 Nov 2020	18 Nov 2020	28 Dec 2020	19 Nov 2020

Total Phenolics in Water

Method: ME-(AU)-[ENV]AN289

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH201M-1	SE213672.001	LB213627	17 Nov 2020	17 Nov 2020	15 Dec 2020	18 Nov 2020	15 Dec 2020	18 Nov 2020
BH202M-1	SE213672.002	LB213627	17 Nov 2020	17 Nov 2020	15 Dec 2020	18 Nov 2020	15 Dec 2020	18 Nov 2020
BH205M-1	SE213672.003	LB213627	17 Nov 2020	17 Nov 2020	15 Dec 2020	18 Nov 2020	15 Dec 2020	18 Nov 2020

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
BH201M-1	SE213672.001	LB213610	17 Nov 2020	17 Nov 2020	16 May 2021	17 Nov 2020	16 May 2021	18 Nov 2020
BH202M-1	SE213672.002	LB213610	17 Nov 2020	17 Nov 2020	16 May 2021	17 Nov 2020	16 May 2021	18 Nov 2020
BH205M-1	SE213672.003	LB213610	17 Nov 2020	17 Nov 2020	16 May 2021	17 Nov 2020	16 May 2021	18 Nov 2020
BH200_GWQD1	SE213672.004	LB213610	17 Nov 2020	17 Nov 2020	16 May 2021	17 Nov 2020	16 May 2021	18 Nov 2020
GWQR1	SE213672.005	LB213610	17 Nov 2020	17 Nov 2020	16 May 2021	17 Nov 2020	16 May 2021	18 Nov 2020

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
BH201M-1	SE213672.001	LB213633	17 Nov 2020	17 Nov 2020	24 Nov 2020	18 Nov 2020	28 Dec 2020	19 Nov 2020
BH202M-1	SE213672.002	LB213633	17 Nov 2020	17 Nov 2020	24 Nov 2020	18 Nov 2020	28 Dec 2020	19 Nov 2020
BH205M-1	SE213672.003	LB213633	17 Nov 2020	17 Nov 2020	24 Nov 2020	18 Nov 2020	28 Dec 2020	19 Nov 2020
BH200_GWQD1	SE213672.004	LB213633	17 Nov 2020	17 Nov 2020	24 Nov 2020	18 Nov 2020	28 Dec 2020	19 Nov 2020
GWQR1	SE213672.005	LB213633	17 Nov 2020	17 Nov 2020	24 Nov 2020	18 Nov 2020	28 Dec 2020	19 Nov 2020

VOCs in Water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH201M-1	SE213672.001	LB213621	17 Nov 2020	17 Nov 2020	24 Nov 2020	17 Nov 2020	27 Dec 2020	18 Nov 2020
BH202M-1	SE213672.002	LB213621	17 Nov 2020	17 Nov 2020	24 Nov 2020	17 Nov 2020	27 Dec 2020	18 Nov 2020
BH205M-1	SE213672.003	LB213621	17 Nov 2020	17 Nov 2020	24 Nov 2020	17 Nov 2020	27 Dec 2020	18 Nov 2020
BH200_GWQD1	SE213672.004	LB213621	17 Nov 2020	17 Nov 2020	24 Nov 2020	17 Nov 2020	27 Dec 2020	18 Nov 2020
GWQR1	SE213672.005	LB213621	17 Nov 2020	17 Nov 2020	24 Nov 2020	17 Nov 2020	27 Dec 2020	18 Nov 2020
GWQTS1	SE213672.006	LB213621	17 Nov 2020	17 Nov 2020	24 Nov 2020	17 Nov 2020	27 Dec 2020	18 Nov 2020
GWQTB1	SE213672.007	LB213621	17 Nov 2020	17 Nov 2020	24 Nov 2020	17 Nov 2020	27 Dec 2020	18 Nov 2020

Volatile Petroleum Hydrocarbons in Water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH201M-1	SE213672.001	LB213621	17 Nov 2020	17 Nov 2020	24 Nov 2020	17 Nov 2020	27 Dec 2020	18 Nov 2020
BH202M-1	SE213672.002	LB213621	17 Nov 2020	17 Nov 2020	24 Nov 2020	17 Nov 2020	27 Dec 2020	18 Nov 2020
BH205M-1	SE213672.003	LB213621	17 Nov 2020	17 Nov 2020	24 Nov 2020	17 Nov 2020	27 Dec 2020	18 Nov 2020
BH200_GWQD1	SE213672.004	LB213621	17 Nov 2020	17 Nov 2020	24 Nov 2020	17 Nov 2020	27 Dec 2020	18 Nov 2020
GWQR1	SE213672.005	LB213621	17 Nov 2020	17 Nov 2020	24 Nov 2020	17 Nov 2020	27 Dec 2020	18 Nov 2020
GWQTS1	SE213672.006	LB213621	17 Nov 2020	17 Nov 2020	24 Nov 2020	17 Nov 2020	27 Dec 2020	18 Nov 2020
GWQTB1	SE213672.007	LB213621	17 Nov 2020	17 Nov 2020	24 Nov 2020	17 Nov 2020	27 Dec 2020	18 Nov 2020

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 identifer 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)	BH201M-1	SE213672.001	%	40 - 130%	60
	BH202M-1	SE213672.002	%	40 - 130%	70
	BH205M-1	SE213672.003	%	40 - 130%	50
d14-p-terphenyl (Surrogate)	BH201M-1	SE213672.001	%	40 - 130%	88
	BH202M-1	SE213672.002	%	40 - 130%	98
	BH205M-1	SE213672.003	%	40 - 130%	64
d5-nitrobenzene (Surrogate)	BH201M-1	SE213672.001	%	40 - 130%	68
	BH202M-1	SE213672.002	%	40 - 130%	74
	BH205M-1	SE213672.003	%	40 - 130%	54

VOCs in Water

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH201M-1	SE213672.001	%	40 - 130%	106
	BH202M-1	SE213672.002	%	40 - 130%	106
	BH205M-1	SE213672.003	%	40 - 130%	105
	BH200_GWQD1	SE213672.004	%	40 - 130%	104
	GWQR1	SE213672.005	%	40 - 130%	105
	GWQTS1	SE213672.006	%	40 - 130%	99
	GWQTB1	SE213672.007	%	40 - 130%	104
d4-1,2-dichloroethane (Surrogate)	BH201M-1	SE213672.001	%	40 - 130%	100
	BH202M-1	SE213672.002	%	40 - 130%	97
	BH205M-1	SE213672.003	%	40 - 130%	98
	BH200_GWQD1	SE213672.004	%	40 - 130%	98
	GWQR1	SE213672.005	%	40 - 130%	97
	GWQTS1	SE213672.006	%	40 - 130%	102
	GWQTB1	SE213672.007	%	40 - 130%	97
d8-toluene (Surrogate)	BH201M-1	SE213672.001	%	40 - 130%	95
	BH202M-1	SE213672.002	%	40 - 130%	98
	BH205M-1	SE213672.003	%	40 - 130%	95
	BH200_GWQD1	SE213672.004	%	40 - 130%	97
	GWQR1	SE213672.005	%	40 - 130%	97
	GWQTS1	SE213672.006	%	40 - 130%	101
	GWQTB1	SE213672.007	%	40 - 130%	96

Volatile Petroleum Hydrocarbons in Water

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH201M-1	SE213672.001	%	40 - 130%	106
	BH202M-1	SE213672.002	%	40 - 130%	106
	BH205M-1	SE213672.003	%	40 - 130%	105
	BH200_GWQD1	SE213672.004	%	40 - 130%	104
	GWQR1	SE213672.005	%	40 - 130%	105
d4-1,2-dichloroethane (Surrogate)	BH201M-1	SE213672.001	%	60 - 130%	100
	BH202M-1	SE213672.002	%	60 - 130%	97
	BH205M-1	SE213672.003	%	60 - 130%	98
	BH200_GWQD1	SE213672.004	%	60 - 130%	98
	GWQR1	SE213672.005	%	60 - 130%	97
d8-toluene (Surrogate)	BH201M-1	SE213672.001	%	40 - 130%	95
	BH202M-1	SE213672.002	%	40 - 130%	98
	BH205M-1	SE213672.003	%	40 - 130%	95
	BH200_GWQD1	SE213672.004	%	40 - 130%	97
	GWQR1	SE213672.005	%	40 - 130%	97

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(Perth)/AN312

Sample Number	Parameter	Units	LOR	Result
LB213636.001	Mercury	mg/L	0.0001	<0.0001

PAH (Polynuclear Aromatic Hydrocarbons) in Water

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

Sample Number		Parameter	Units	LOR	Result
LB213633.001		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)	%	-	62
		2-fluorobiphenyl (Surrogate)	%	-	62
		d14-p-terphenyl (Surrogate)	%	-	80

Total Phenolics in Water

Method: ME-(AU)-[ENV]AN289

Sample Number	Parameter	Units	LOR	Result
LB213627.001	Total Phenols	mg/L	0.01	<0.01

Trace Metals (Dissolved) in Water by ICPMS

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

Sample Number	Parameter	Units	LOR	Result
LB213610.001	Aluminium, Al	µg/L	5	<5
	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
LB213633.001	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
LB213621.001	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

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
LB213621.001	Halogenated Aliphatics	Iodomethane	µg/L	5	<5
		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
		Hexachlorobutadiene	µg/L	0.5	<0.5
	Halogenated Aromatics	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
		1,2,4-trichlorobenzene	µg/L	0.5	<0.5
		1,2,3-trichlorobenzene	µg/L	0.5	<0.5
	Monocyclic Aromatic Hydrocarbons	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
		o-xylene	µg/L	0.5	<0.5
		Styrene (Vinyl benzene)	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
		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
	Nitrogenous Compounds	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)	%	-	96
		d8-toluene (Surrogate)	%	-	95
		Bromofluorobenzene (Surrogate)	%	-	102
	Trihalomethanes	Chloroform (THM)	µg/L	0.5	<0.5
		Bromodichloromethane (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
LB213621.001	Trihalomethanes	Dibromochloromethane (THM)	µg/L	0.5	<0.5
		Bromoform (THM)	µg/L	0.5	<0.5

Volatile Petroleum Hydrocarbons in Water

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

Sample Number		Parameter	Units	LOR	Result
LB213621.001		TRH C6-C9	µg/L	40	<40
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	96
		d8-toluene (Surrogate)	%	-	95
		Bromofluorobenzene (Surrogate)	%	-	102

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / 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 x SDL / Mean + 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 identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Mercury (dissolved) in Water

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE213677.005	LB213636.013	Mercury	µg/L	0.0001	0.00096	0.0014	200	37

PAH (Polynuclear Aromatic Hydrocarbons) in Water

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE213672.002	LB213633.028		Naphthalene	µg/L	0.1	<0.1	0.04	200	0
			2-methylnaphthalene	µg/L	0.1	<0.1	0	200	0
			1-methylnaphthalene	µg/L	0.1	0.2	0.12	99	34
			Acenaphthylene	µg/L	0.1	<0.1	0	200	0
			Acenaphthene	µg/L	0.1	0.9	0.71	43	23
			Fluorene	µg/L	0.1	0.3	0.24	67	22
			Phenanthrene	µg/L	0.1	0.1	0.09	125	18
			Anthracene	µg/L	0.1	<0.1	0.01	200	0
			Fluoranthene	µg/L	0.1	<0.1	0.03	200	0
			Pyrene	µg/L	0.1	<0.1	0.03	200	0
			Benzo(a)anthracene	µg/L	0.1	<0.1	0	200	0
			Chrysene	µg/L	0.1	<0.1	0	200	0
			Benzo(b&j)fluoranthene	µg/L	0.1	<0.1	0	200	0
			Benzo(k)fluoranthene	µg/L	0.1	<0.1	0	200	0
			Benzo(a)pyrene	µg/L	0.1	<0.1	0	200	0
			Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1	0	200	0
			Dibenzo(ah)anthracene	µg/L	0.1	<0.1	0	200	0
			Benzo(ghi)perylene	µg/L	0.1	<0.1	0	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	µg/L	-	0.4	0.36	30	3
			2-fluorobiphenyl (Surrogate)	µg/L	-	0.4	0.33	30	6
			d14-p-terphenyl (Surrogate)	µg/L	-	0.5	0.49	30	0

Total Phenolics in Water

Method: ME-(AU)-[ENV]AN289

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE213673.001	LB213627.013	Total Phenols	mg/L	0.01	0.00473	0.00414	200	0

Trace Metals (Dissolved) in Water by ICPMS

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE213672.005	LB213610.011	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	200	0
		Zinc, Zn	µg/L	5	<5	<5	200	0

TRH (Total Recoverable Hydrocarbons) in Water

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE213672.002	LB213633.028		TRH C10-C14	µg/L	50	<50	0	200	0
			TRH C15-C28	µg/L	200	<200	0	200	0
			TRH C29-C36	µg/L	200	<200	0	200	0
			TRH C37-C40	µg/L	200	<200	0	200	0
			TRH C10-C40	µg/L	320	<320	0	200	0
		TRH F Bands	TRH >C10-C16	µg/L	60	<60	0	200	0
			TRH >C10-C16 - Naphthalene (F2)	µg/L	60	<60	0	200	0
			TRH >C16-C34 (F3)	µg/L	500	<500	0	200	0
			TRH >C34-C40 (F4)	µg/L	500	<500	0	200	0

VOCs in Water

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE213550.003	LB213621.028	Fumigants	2,2-dichloropropane	µg/L	0.5	0	0	200	0
			1,2-dichloropropane	µg/L	0.5	0.0225831982	0	200	0
			cis-1,3-dichloropropene	µg/L	0.5	0	0	200	0
			trans-1,3-dichloropropene	µg/L	0.5	0	0	200	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / 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 x SDL / Mean + 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 identifer 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**

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE213550.003	LB213621.028	Fumigants	1,2-dibromoethane (EDB)	µg/L	0.5	0	0	200	0
		Halogenated	Dichlorodifluoromethane (CFC-12)	µg/L	5	0.2280292993	0	200	0
		Aliphatics	Chloromethane	µg/L	5	0	0	200	0
			Vinyl chloride (Chloroethene)	µg/L	0.3	0.1094914545	0	200	0
			Bromomethane	µg/L	10	0.05614599780	0.3177248701	200	0
			Chloroethane	µg/L	5	0.2683791899	0	200	0
			Trichlorofluoromethane	µg/L	1	0	0	200	0
			Iodomethane	µg/L	5	0.0604728763	0	200	0
			1,1-dichloroethene	µg/L	0.5	0.0055935625	0	200	0
			Dichloromethane (Methylene chloride)	µg/L	5	0.12230168550	0.0246045428	200	0
			Allyl chloride	µg/L	2	0	0	200	0
			trans-1,2-dichloroethene	µg/L	0.5	0.0107225327	0	200	0
			1,1-dichloroethane	µg/L	0.5	0	0	200	0
			cis-1,2-dichloroethene	µg/L	0.5	0.1529098749	0	200	0
			Bromochloromethane	µg/L	0.5	0.0007212106	0	200	0
			1,2-dichloroethane	µg/L	0.5	0.0376675051	0	200	0
			1,1,1-trichloroethane	µg/L	0.5	0	0	200	0
			1,1-dichloropropene	µg/L	0.5	0	0	200	0
			Carbon tetrachloride	µg/L	0.5	0	0.0434641675	200	0
			Dibromomethane	µg/L	0.5	0	0	200	0
			Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	0.0161596385	0	200	0
			1,1,2-trichloroethane	µg/L	0.5	0	0	200	0
			1,3-dichloropropane	µg/L	0.5	0	0	200	0
			Tetrachloroethene (Perchloroethylene,PCE)	µg/L	0.5	0.0023028599	0	200	0
			1,1,1,2-tetrachloroethane	µg/L	0.5	0	0	200	0
			cis-1,4-dichloro-2-butene	µg/L	1	0	0	200	0
			1,1,2,2-tetrachloroethane	µg/L	0.5	0	0.0139958119	200	0
			1,2,3-trichloropropane	µg/L	0.5	0	0	200	0
			trans-1,4-dichloro-2-butene	µg/L	1	0	0	200	0
			1,2-dibromo-3-chloropropane	µg/L	0.5	0	0	200	0
			Hexachlorobutadiene	µg/L	0.5	0.0032982978	0	200	0
		Halogenated	Chlorobenzene	µg/L	0.5	6.48339714665	4.4942818479	38	17
		Aromatics	Bromobenzene	µg/L	0.5	0	0	200	0
			2-chlorotoluene	µg/L	0.5	0.0208504932	0	200	0
			4-chlorotoluene	µg/L	0.5	0	0	200	0
			1,3-dichlorobenzene	µg/L	0.5	0.0384217871	0	200	0
			1,4-dichlorobenzene	µg/L	0.3	6.05111318485	7.384823338	35	5
			1,2-dichlorobenzene	µg/L	0.5	1.2566	0.8898539813	77	34
			1,2,4-trichlorobenzene	µg/L	0.5	0.0193940891	0	200	0
			1,2,3-trichlorobenzene	µg/L	0.5	0.00379726290	0.0560277944	200	0
		Monocyclic	Benzene	µg/L	0.5	1.11381482330	0.9769432056	78	13
		Aromatic	Toluene	µg/L	0.5	0.0945541812	0	200	0
			Ethylbenzene	µg/L	0.5	0.0146400789	0	200	0
			m/p-xylene	µg/L	1	0.1795762293	0	200	0
			o-xylene	µg/L	0.5	0.2492431724	0	200	0
			Styrene (Vinyl benzene)	µg/L	0.5	0	0	200	0
			Isopropylbenzene (Cumene)	µg/L	0.5	0	0	200	0
			n-propylbenzene	µg/L	0.5	0.17099552090	0.8494014143	128	52
			1,3,5-trimethylbenzene	µg/L	0.5	0.0249987582	0	200	0
			tert-butylbenzene	µg/L	0.5	0.1566734290	0	200	0
			1,2,4-trimethylbenzene	µg/L	0.5	0.1023553089	0	200	0
			sec-butylbenzene	µg/L	0.5	0.21865588480	0.3430238788	200	0
			p-isopropyltoluene	µg/L	0.5	0.1612136968	0	200	0
			n-butylbenzene	µg/L	0.5	0	0	200	0
		Nitrogenous	Acrylonitrile	µg/L	0.5	0	0	200	0
		Oxygenated	Acetone (2-propanone)	µg/L	10	1.98954693651	1.1602286425	200	0
		Compounds	MtBE (Methyl-tert-butyl ether)	µg/L	2	0.0877846227	0	200	0
			Vinyl acetate	µg/L	10	0	0	200	0
			MEK (2-butanone)	µg/L	10	0	0	200	0
			MIBK (4-methyl-2-pentanone)	µg/L	5	0.0233551614	0	200	0
			2-hexanone (MBK)	µg/L	5	0	0	200	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / 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 x SDL / Mean + 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 identifer 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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE213550.003	LB213621.028	Polycyclic	Naphthalene	µg/L	0.5	0.24568231900	.5440165414	157	8
		Sulphonated	Carbon disulfide	µg/L	2	0.0115135558	0	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	9.892881506310	.1883156666	30	3
			d8-toluene (Surrogate)	µg/L	-	9.734870481410	.7140157771	30	10
			Bromofluorobenzene (Surrogate)	µg/L	-	10.53667305330	.2085276359	30	3
		Trihalomethanes	Chloroform (THM)	µg/L	0.5	0.0257369582	0	200	0
			Bromodichloromethane (THM)	µg/L	0.5	0	0	200	0
			Dibromochloromethane (THM)	µg/L	0.5	0	0	200	0
			Bromoform (THM)	µg/L	0.5	0	0	200	0
SE213672.001	LB213621.029	Fumigants	2,2-dichloropropane	µg/L	0.5	<0.5	0	200	0
			1,2-dichloropropane	µg/L	0.5	<0.5	0	200	0
			cis-1,3-dichloropropene	µg/L	0.5	<0.5	0	200	0
			trans-1,3-dichloropropene	µg/L	0.5	<0.5	0	200	0
			1,2-dibromoethane (EDB)	µg/L	0.5	<0.5	0	200	0
		Halogenated Aliphatics	Dichlorodifluoromethane (CFC-12)	µg/L	5	<5	0	200	0
			Chloromethane	µg/L	5	<5	0	200	0
			Vinyl chloride (Chloroethene)	µg/L	0.3	<0.3	0	200	0
			Bromomethane	µg/L	10	<10	0.2231407639	200	0
			Chloroethane	µg/L	5	<5	0	200	0
			Trichlorofluoromethane	µg/L	1	<1	0	200	0
			Iodomethane	µg/L	5	<5	0	200	0
			1,1-dichloroethene	µg/L	0.5	<0.5	0	200	0
			Dichloromethane (Methylene chloride)	µg/L	5	<5	0	200	0
			Allyl chloride	µg/L	2	<2	0	200	0
			trans-1,2-dichloroethene	µg/L	0.5	<0.5	0	200	0
			1,1-dichloroethane	µg/L	0.5	<0.5	0	200	0
			cis-1,2-dichloroethene	µg/L	0.5	<0.5	0	200	0
			Bromochloromethane	µg/L	0.5	<0.5	0	200	0
			1,2-dichloroethane	µg/L	0.5	<0.5	0	200	0
			1,1,1-trichloroethane	µg/L	0.5	<0.5	0	200	0
			1,1-dichloropropene	µg/L	0.5	<0.5	0	200	0
			Carbon tetrachloride	µg/L	0.5	<0.5	0.0444894402	200	0
			Dibromomethane	µg/L	0.5	<0.5	0	200	0
			Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	<0.5	0	200	0
			1,1,2-trichloroethane	µg/L	0.5	<0.5	0	200	0
			1,3-dichloropropane	µg/L	0.5	<0.5	0	200	0
			Tetrachloroethene (Perchloroethylene,PCE)	µg/L	0.5	<0.5	0	200	0
			1,1,1,2-tetrachloroethane	µg/L	0.5	<0.5	0	200	0
			cis-1,4-dichloro-2-butene	µg/L	1	<1	0	200	0
			1,1,2,2-tetrachloroethane	µg/L	0.5	<0.5	0	200	0
			1,2,3-trichloropropane	µg/L	0.5	<0.5	0	200	0
			trans-1,4-dichloro-2-butene	µg/L	1	<1	0	200	0
			1,2-dibromo-3-chloropropane	µg/L	0.5	<0.5	0	200	0
			Hexachlorobutadiene	µg/L	0.5	<0.5	0	200	0
		Halogenated Aromatics	Chlorobenzene	µg/L	0.5	<0.5	0	200	0
			Bromobenzene	µg/L	0.5	<0.5	0	200	0
			2-chlorotoluene	µg/L	0.5	<0.5	0	200	0
			4-chlorotoluene	µg/L	0.5	<0.5	0	200	0
			1,3-dichlorobenzene	µg/L	0.5	<0.5	0	200	0
			1,4-dichlorobenzene	µg/L	0.3	<0.3	0	200	0
			1,2-dichlorobenzene	µg/L	0.5	<0.5	0	200	0
			1,2,4-trichlorobenzene	µg/L	0.5	<0.5	0	200	0
			1,2,3-trichlorobenzene	µg/L	0.5	<0.5	0.0431782083	200	0
		Monocyclic Aromatic	Benzene	µg/L	0.5	<0.5	0	200	0
			Toluene	µg/L	0.5	<0.5	0.0981590549	200	0
			Ethylbenzene	µg/L	0.5	0.7	0.2980864589	131	32
			m/p-xylene	µg/L	1	1	0.5857493706	136	26
			o-xylene	µg/L	0.5	0.5	0.1820755524	168	8
			Styrene (Vinyl benzene)	µg/L	0.5	<0.5	0	200	0
			Isopropylbenzene (Cumene)	µg/L	0.5	<0.5	0	200	0
			n-propylbenzene	µg/L	0.5	<0.5	0	200	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / 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 x SDL / Mean + 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 identifer 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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE213672.001	LB213621.029	Monocyclic	1,3,5-trimethylbenzene	µg/L	0.5	<0.5	0	200	0
		Aromatic	tert-butylbenzene	µg/L	0.5	<0.5	0	200	0
			1,2,4-trimethylbenzene	µg/L	0.5	<0.5	0	200	0
			sec-butylbenzene	µg/L	0.5	<0.5	0	200	0
			p-isopropyltoluene	µg/L	0.5	<0.5	0	200	0
			n-butylbenzene	µg/L	0.5	<0.5	0	200	0
		Nitrogenous	Acrylonitrile	µg/L	0.5	<0.5	0	200	0
		Oxygenated	Acetone (2-propanone)	µg/L	10	<10	1.8369142069	200	0
		Compounds	MtBE (Methyl-tert-butyl ether)	µg/L	2	<2	0	200	0
			Vinyl acetate	µg/L	10	<10	0	200	0
			MEK (2-butanone)	µg/L	10	<10	0	200	0
			MIBK (4-methyl-2-pentanone)	µg/L	5	36	33.0559	45	7
			2-hexanone (MBK)	µg/L	5	<5	0	200	0
		Polycyclic	Naphthalene	µg/L	0.5	0.6	0.8577264735	99	36
		Sulphonated	Carbon disulfide	µg/L	2	<2	0.3300192698	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.0	10.1597676902	30	1
			d8-toluene (Surrogate)	µg/L	-	9.5	10.3358283329	30	9
			Bromofluorobenzene (Surrogate)	µg/L	-	10.6	10.8652308037	30	3
		Trihalomethan	Chloroform (THM)	µg/L	0.5	<0.5	0	200	0
		es	Bromodichloromethane (THM)	µg/L	0.5	<0.5	0	200	0
			Dibromochloromethane (THM)	µg/L	0.5	<0.5	0	200	0
			Bromoform (THM)	µg/L	0.5	<0.5	0	200	0

Volatile Petroleum Hydrocarbons in Water

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE213550.003	LB213621.022		TRH C6-C10	µg/L	50	12.6635478442	8.3134538252	194	0
			TRH C6-C9	µg/L	40	6.1532546946	2.5877557221	194	6
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	9.8928815063	10.1883156668	30	3
			d8-toluene (Surrogate)	µg/L	-	9.7348704814	10.7140157771	30	10
			Bromofluorobenzene (Surrogate)	µg/L	-	10.5366730533	10.2085276359	30	3
		VPH F Bands	Benzene (F0)	µg/L	0.5	1.1138148233	0.9769432056	78	13
			TRH C6-C10 minus BTEX (F1)	µg/L	50	11.5497330208	7.3365106196	200	0
SE213672.001	LB213621.023		TRH C6-C10	µg/L	50	<50	15.6938057209	164	0
			TRH C6-C9	µg/L	40	<40	15.3799119309	144	13
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.0	10.1597676902	30	1
			d8-toluene (Surrogate)	µg/L	-	9.5	10.3358283329	30	9
			Bromofluorobenzene (Surrogate)	µg/L	-	10.6	10.8652308037	30	3
		VPH F Bands	Benzene (F0)	µg/L	0.5	<0.5	0	200	0
			TRH C6-C10 minus BTEX (F1)	µg/L	50	<50	15.6938057209	168	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.

PAH (Polynuclear Aromatic Hydrocarbons) in Water

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB213633.002		Naphthalene	µg/L	0.1	27	40	60 - 140	67
		Acenaphthylene	µg/L	0.1	31	40	60 - 140	78
		Acenaphthene	µg/L	0.1	29	40	60 - 140	72
		Phenanthrene	µg/L	0.1	31	40	60 - 140	78
		Anthracene	µg/L	0.1	32	40	60 - 140	80
		Fluoranthene	µg/L	0.1	33	40	60 - 140	82
		Pyrene	µg/L	0.1	32	40	60 - 140	80
		Benzo(a)pyrene	µg/L	0.1	30	40	60 - 140	76
	Surrogates	d5-nitrobenzene (Surrogate)	µg/L	-	0.3	0.5	40 - 130	62
		2-fluorobiphenyl (Surrogate)	µg/L	-	0.3	0.5	40 - 130	64
		d14-p-terphenyl (Surrogate)	µg/L	-	0.4	0.5	40 - 130	72

Total Phenolics in Water

Method: ME-(AU)-[ENV]AN289

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB213627.002	Total Phenols	mg/L	0.01	0.22	0.25	80 - 120	88

Trace Metals (Dissolved) in Water by ICPMS

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB213610.002	Aluminium, Al	µg/L	5	19	20	80 - 120	96
	Arsenic, As	µg/L	1	17	20	80 - 120	87
	Cadmium, Cd	µg/L	0.1	20	20	80 - 120	99
	Chromium, Cr	µg/L	1	20	20	80 - 120	101
	Copper, Cu	µg/L	1	20	20	80 - 120	101
	Lead, Pb	µg/L	1	18	20	80 - 120	91
	Nickel, Ni	µg/L	1	19	20	80 - 120	97
	Zinc, Zn	µg/L	5	21	20	80 - 120	104

TRH (Total Recoverable Hydrocarbons) in Water

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB213633.002		TRH C10-C14	µg/L	50	1300	1200	60 - 140	108
		TRH C15-C28	µg/L	200	1400	1200	60 - 140	118
		TRH C29-C36	µg/L	200	1300	1200	60 - 140	105
	TRH F Bands	TRH >C10-C16	µg/L	60	1400	1200	60 - 140	114
		TRH >C16-C34 (F3)	µg/L	500	1400	1200	60 - 140	117
		TRH >C34-C40 (F4)	µg/L	500	590	600	60 - 140	98

VOCs in Water

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB213621.002	Halogenated	1,1-dichloroethene	µg/L	0.5	54	45.45	60 - 140	119
	Aliphatics	1,2-dichloroethane	µg/L	0.5	56	45.45	60 - 140	123
		Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	54	45.45	60 - 140	118
	Halogenated	Chlorobenzene	µg/L	0.5	52	45.45	60 - 140	114
	Monocyclic	Benzene	µg/L	0.5	51	45.45	60 - 140	112
	Aromatic	Toluene	µg/L	0.5	48	45.45	60 - 140	107
		Ethylbenzene	µg/L	0.5	47	45.45	60 - 140	104
		m/p-xylene	µg/L	1	95	90.9	60 - 140	104
		o-xylene	µg/L	0.5	47	45.45	60 - 140	104
	Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.3	10	60 - 140	103
		d8-toluene (Surrogate)	µg/L	-	10.4	10	70 - 130	104
		Bromofluorobenzene (Surrogate)	µg/L	-	9.9	10	70 - 130	99
	Trihalomethan	Chloroform (THM)	µg/L	0.5	57	45.45	60 - 140	124

Volatile Petroleum Hydrocarbons in Water

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB213621.002		TRH C6-C10	µg/L	50	930	946.63	60 - 140	98
		TRH C6-C9	µg/L	40	800	818.71	60 - 140	97
	Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.3	10	60 - 140	103
		d8-toluene (Surrogate)	µg/L	-	10.4	10	70 - 130	104
		Bromofluorobenzene (Surrogate)	µg/L	-	9.9	10	70 - 130	99
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	µg/L	50	640	639.67	60 - 140	100

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 identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Mercury (dissolved) in Water

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE213649.007	LB213636.004	Mercury	mg/L	0.0001	0.0019	0.0088	0.008	96

Total Phenolics in Water

Method: ME-(AU)-[ENV]AN289

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE213672.001	LB213627.004	Total Phenols	mg/L	0.01	0.25	0.01	0.25	96

Trace Metals (Dissolved) in Water by ICPMS

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE213649.007	LB213610.004	Arsenic, As	µg/L	1	18	0.002	20	92
		Cadmium, Cd	µg/L	0.1	21	0.002	20	107
		Chromium, Cr	µg/L	1	22	-0.019	20	108
		Copper, Cu	µg/L	1	22	-0.115	20	110
		Lead, Pb	µg/L	1	19	0.013	20	94
		Nickel, Ni	µg/L	1	21	0.035	20	105
		Zinc, Zn	µg/L	5	24	1.566	20	115

VOCs in Water

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE213665.001	LB213621.030	Fumigants	2,2-dichloropropane	µg/L	0.5	<0.5	<0.5	-	-
			1,2-dichloropropane	µg/L	0.5	<0.5	<0.5	-	-
			cis-1,3-dichloropropene	µg/L	0.5	<0.5	<0.5	-	-
			trans-1,3-dichloropropene	µg/L	0.5	<0.5	<0.5	-	-
			1,2-dibromoethane (EDB)	µg/L	0.5	<0.5	<0.5	-	-
		Halogenated	Dichlorodifluoromethane (CFC-12)	µg/L	5	<5	<5	-	-
		Aliphatics	Chloromethane	µg/L	5	<5	<5	-	-
			Vinyl chloride (Chloroethene)	µg/L	0.3	0.3	<0.3	-	-
			Bromomethane	µg/L	10	<10	<10	-	-
			Chloroethane	µg/L	5	<5	<5	-	-
			Trichlorofluoromethane	µg/L	1	<1	<1	-	-
			Iodomethane	µg/L	5	<5	<5	-	-
			1,1-dichloroethene	µg/L	0.5	41	<0.5	45.45	90
			Dichloromethane (Methylene chloride)	µg/L	5	<5	<5	-	-
			Allyl chloride	µg/L	2	<2	<2	-	-
			trans-1,2-dichloroethene	µg/L	0.5	<0.5	<0.5	-	-
			1,1-dichloroethane	µg/L	0.5	<0.5	<0.5	-	-
			cis-1,2-dichloroethene	µg/L	0.5	<0.5	<0.5	-	-
			Bromochloromethane	µg/L	0.5	<0.5	<0.5	-	-
			1,2-dichloroethane	µg/L	0.5	44	<0.5	45.45	97
			1,1,1-trichloroethane	µg/L	0.5	<0.5	<0.5	-	-
			1,1-dichloropropene	µg/L	0.5	<0.5	<0.5	-	-
			Carbon tetrachloride	µg/L	0.5	<0.5	<0.5	-	-
			Dibromomethane	µg/L	0.5	<0.5	<0.5	-	-
			Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	41	<0.5	45.45	90
			1,1,2-trichloroethane	µg/L	0.5	<0.5	<0.5	-	-
			1,3-dichloropropane	µg/L	0.5	<0.5	<0.5	-	-
			Tetrachloroethene (Perchloroethylene,PCE)	µg/L	0.5	<0.5	<0.5	-	-
			1,1,1,2-tetrachloroethane	µg/L	0.5	<0.5	<0.5	-	-
			cis-1,4-dichloro-2-butene	µg/L	1	<1	<1	-	-
			1,1,2,2-tetrachloroethane	µg/L	0.5	<0.5	<0.5	-	-
			1,2,3-trichloropropane	µg/L	0.5	<0.5	<0.5	-	-
			trans-1,4-dichloro-2-butene	µg/L	1	<1	<1	-	-
			1,2-dibromo-3-chloropropane	µg/L	0.5	<0.5	<0.5	-	-
			Hexachlorobutadiene	µg/L	0.5	<0.5	<0.5	-	-
		Halogenated	Chlorobenzene	µg/L	0.5	52	<0.5	45.45	114
		Aromatics	Bromobenzene	µg/L	0.5	<0.5	<0.5	-	-
			2-chlorotoluene	µg/L	0.5	<0.5	<0.5	-	-
			4-chlorotoluene	µg/L	0.5	<0.5	<0.5	-	-
			1,3-dichlorobenzene	µg/L	0.5	<0.5	<0.5	-	-

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 identifer 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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE213665.001	LB213621.030	Halogenated	1,4-dichlorobenzene	µg/L	0.3	<0.3	<0.3	-	-
		Aromatics	1,2-dichlorobenzene	µg/L	0.5	<0.5	<0.5	-	-
			1,2,4-trichlorobenzene	µg/L	0.5	<0.5	<0.5	-	-
			1,2,3-trichlorobenzene	µg/L	0.5	<0.5	<0.5	-	-
		Monocyclic	Benzene	µg/L	0.5	49	<0.5	45.45	108
		Aromatic	Toluene	µg/L	0.5	49	<0.5	45.45	108
			Ethylbenzene	µg/L	0.5	47	<0.5	45.45	103
			m/p-xylene	µg/L	1	96	<1	90.9	105
			o-xylene	µg/L	0.5	47	<0.5	45.45	103
			Styrene (Vinyl benzene)	µg/L	0.5	<0.5	<0.5	-	-
			Isopropylbenzene (Cumene)	µg/L	0.5	<0.5	<0.5	-	-
			n-propylbenzene	µg/L	0.5	<0.5	<0.5	-	-
			1,3,5-trimethylbenzene	µg/L	0.5	<0.5	<0.5	-	-
			tert-butylbenzene	µg/L	0.5	<0.5	<0.5	-	-
			1,2,4-trimethylbenzene	µg/L	0.5	<0.5	<0.5	-	-
			sec-butylbenzene	µg/L	0.5	<0.5	<0.5	-	-
			p-isopropyltoluene	µg/L	0.5	<0.5	<0.5	-	-
			n-butylbenzene	µg/L	0.5	<0.5	<0.5	-	-
		Nitrogenous	Acrylonitrile	µg/L	0.5	<0.5	<0.5	-	-
		Oxygenated	Acetone (2-propanone)	µg/L	10	<10	<10	-	-
		Compounds	MtBE (Methyl-tert-butyl ether)	µg/L	2	<1	<2	-	-
			Vinyl acetate	µg/L	10	<10	<10	-	-
			MEK (2-butanone)	µg/L	10	<10	<10	-	-
			MIBK (4-methyl-2-pentanone)	µg/L	5	<5	<5	-	-
			2-hexanone (MBK)	µg/L	5	<5	<5	-	-
		Polycyclic	Naphthalene	µg/L	0.5	<0.5	<0.5	-	-
		Sulphonated	Carbon disulfide	µg/L	2	<2	<2	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	9.8	9.7	-	98
			d8-toluene (Surrogate)	µg/L	-	10.0	9.7	-	100
			Bromofluorobenzene (Surrogate)	µg/L	-	10.0	10.7	-	100
		Trihalometha	Chloroform (THM)	µg/L	0.5	42	<0.5	45.45	93
		nes	Bromodichloromethane (THM)	µg/L	0.5	<0.5	<0.5	-	-
			Dibromochloromethane (THM)	µg/L	0.5	<0.5	<0.5	-	-
			Bromoform (THM)	µg/L	0.5	<0.5	<0.5	-	-

Volatile Petroleum Hydrocarbons in Water

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE213665.001	LB213621.024		TRH C6-C10	µg/L	50	980	<50	946.63	103
			TRH C6-C9	µg/L	40	980	<40	818.71	119
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	9.8	9.7	-	98
			d8-toluene (Surrogate)	µg/L	-	10.0	9.7	-	100
			Bromofluorobenzene (Surrogate)	µg/L	-	10.0	10.7	-	100
		VPH F	Benzene (F0)	µg/L	0.5		<0.5	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	µg/L	50	690	<50	639.67	108

MATRIX SPIKE DUPLICATES

SE213672 R0

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / 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 x SDL / Mean + 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 identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

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.

SGS Environmental Services is accredited by NATA for Chemical Testing (Reg.No.2562) and Quality System compliance to ISO/IEC 17025. The QC parameters contained within are designed to meet NEPM 1999 requirements.

Quality Control samples included in any analytical run are listed below.

Reagent/Analysis Blank (BLK) **Method Blank (MB)**	Sample free reagents carried through the preparation/extraction/digestion procedure and analysed at the beginning of every sample batch analysis. A reagent blank is prepared and analysed with every batch of samples plus with each new batch of solvent prior to use.
Sample Matrix Spike (MS) & Matrix Spike Duplicate (MSD)	Sample replicates spiked with identical concentrations of target analyte(s). The spiking occurs during the sample preparation and prior to the extraction/digestion procedure. They are used to document the precision and bias of a method in a given sample matrix. Where there is not enough sample available to prepare a spiked sample, another known soil/sand or water may be used. A duplicate spiked sample is analysed at least every 20 samples.
Surrogate Spike (SS)	At least one but up to three surrogate compounds are added to all samples requiring analysis for organics prior to extraction. Used to determine the extraction efficiency. They are organic compounds which are similar to the target analyte(s) in chemical composition and behaviour in the analytical process, but which are not normally found in environmental samples. Where possible they are surrogate compounds recommended by the USEPA.
Control Matrix Spike (CMS)	To ensure spike recoveries can be determined for every batch of samples a control matrix is spiked with identical concentrations of target analyte(s) and then analysed. These results allow recoveries to be determined in the event that the matrix spikes are unusable (eg. matrix spikes performed on heavily contaminated samples). These are analysed at least every 20 samples.
Internal Standard (IS)	Added to all samples requiring analysis for organics (where relevant) after the extraction process; the compounds serve to give a standard of retention time and response, which is invariant from run-to-run with the instruments. Where possible they are standard compounds recommended by the USEPA.
Lab Duplicates (D)	A separate portion of a sample being analysed that is treated the same as the other samples in the batch. One duplicate is processed at least every 10 samples.
Lab Control Standards/Samples (LCS)	Prepared from a source independent of the calibration standards. At least one control standard is included in each run to confirm calibration validity. Thereafter they are analysed at least every one in 20 samples plus at the end of each analytical run. This data is not reported.
Continuous Calibration Verification (CCV) or **Calibration Check Standard & Blank**	A calibration check standard or CCV and blank are run after every 20 samples of an instrumental analysis run to assess analytical drift. Calibration Standards are checked old versus new with a criteria of ±10%

Quality Assurance Programs are listed below:

Statistical analysis of Quality Control data (SQC)	Quality control data is plotted on control charts using the APHA procedure with warning and control limits at 2 and 3 standard deviations respectively. See also QMS Procedure "Statistical Quality Control".
Certified Reference Materials (CRM/SRM)	Certified Reference Materials and Standards are regularly analysed. These materials/standards have certified reference values for various parameters.
Proficiency Testing	Regular proficiency test samples are analysed by our laboratories. SGS Environmental participates in a number of programs. Results and proficiency status are compiled and sent to participating laboratory post data interpretation. Failure to comply with acceptable values result in further investigations.
Inter-laboratory & Intra-laboratory Testing	SGS Environmental Services has schedules in the Quality Systems to participate in Inter/Intra laboratory testing conducted internally and by other parties.
Data Acceptance Criteria Unless otherwise specified in the method or method manual the following general criteria apply to all inorganic tests. All recoveries are to be reported to 3 significant figures.	Failure to meet the internal acceptance criteria will result in sample batch repeats dependent upon investigation outcomes. For data to be accepted: <u>Inorganics (water samples)</u> • For all inorganic analytes the Reagent & Method Blanks must be less than the LOR. • The Calibration Check Standards or Continuous Calibration Verification (CCV) must be within ±15%. • Control Standards must be 80-120% of the accepted value. • The Calibration Check Blanks must be less than the LOR. • Lab Duplicates RPD to be <15%*. Note: If client <u>field</u> duplicates do not meet this criteria it may indicate heterogeneity and shall be noted on the data reports for QC samples. • Sample (and if applicable Control) Matrix Spike♬ Duplicate recovery RPD to be <30%. • Where CRMs are used, results to be within ± 2 standard deviations of the expected value. <u>Inorganics (soil samples)</u> • For all inorganic analytes the Reagent & Method Blanks must be less than the LOR. • The Calibration Check Standards or Continuous Calibration Verification (CCV) must be within ±15%. • Control Standards must be 80-120% of the accepted value. • The Calibration Check Blanks must be less than the LOR. • Lab duplicate RPD to be <30%* for sample results greater than 10 times LOR. • Sample Matrix Spike Duplicate (MS♬/MSD) recovery RPD to be <30%. In the event that the matrix spike has been applied to samples whose matrix or contamination is problematic to the method then these acceptance criteria apply to the Control Matrix Spike (CMS/D). • Where CRMs are used, results to be within ± 2 standard deviations of the expected value.

Data Acceptance Criteria Unless otherwise specified in the method or method manual the following general criteria apply to all organic tests. All recoveries are to be reported to 3 significant figures.	Organics • Volatile & extractable Reagent & Method Blanks must contain levels less than or equal to LOR. • The Calibration Check Standards or Continuous Calibration Verification (CCV) must be within ±25%. Some analytes may have specific criteria. • Control Standards (LCS/CMS) and Certified Reference Materials (CRM) recoveries are to be within established control limits or as a default 60-140% unless compound specific limits apply. • Retention times are to vary by no more than 0.2 min. • **At least two of three** routine level soil sample Surrogate Spike (SS) recoveries 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 acceptance criterion. Any recoveries outside these limits will have comment. • Water sample Surrogates Spike (SS) recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion. Any recoveries outside these limits will have comment. • Lab Duplicates (D) must have a RPD <30%*. • Sample Matrix Spike Duplicate (MS♬/MSD) recovery RPD to be <30%. In the event that the matrix spike has been applied to samples whose matrix or contamination is problematic to the method then these acceptance criteria apply to the Control Matrix Spike (CMS/D).

*Only if results are at least 10 times the LOR otherwise no acceptance criteria for RPD's apply. Application of more stringent criteria shall be applied for clean water sample from water boards and any other nominated client contracts. Nominal 10xLOR criteria are dropped to 5xLOR where specified.
♬Matrix do not readily equate to definitive recovery due to inherent matrix interferences and thus do not have recovery compliance values set. As a guide inorganic recoveries should be between 70-130% and for organics 60-130%

Batch Structure Summary

An analytical batch is nominally considered as 20 samples or smaller. As a standard template the following should be **used as a guide** according to the above Quality Control Types:

1	MB	16	UNK_DUP
2	STD1	17	MS
3	STD2	18	MS_DUP
4	STD3	19	UNK 11
5	LCS	20	UNK 12
6	BLK	21	UNK 13
7	UNK 1	22	UNK 14
8	UNK 2	23	UNK 15
9	UNK 3	24	UNK 16
10	UNK 4	25	UNK 17
11	UNK 5	26	UNK 18
12	UNK 6	27	UNK 19
13	UNK 7	28	UNK 20 (SS if applicable)
14	UNK 8	29	UNK_DUP
15	UNK 9	30	CCV
16	UNK 10 (SS if applicable)	31	CRM / SRM / CMS / LCS

Table QC1 - Containers, Preservation Requirements and Holding Times - Soil			
Parameter	Container	Preservation	Maximum Holding Time
Acid digestible metals and metalloids - Total and TCLP (As,Cd.,Cu,Cr,Ni,Pb,Zn)	Glass with Teflon Lid	Nil	6 months
Mercury	Glass with Teflon Lid	Nil	28 days
TPH / BTEX / VOC / SVOC / CHC	Glass with Teflon Lid	4^oC, zero headspace	14 days
PAHs (total and TCLP)	Glass with Teflon Lid	4^oC [1]	14 days
Phenols	Glass with Teflon Lid	4^oC [1]	14 days
OCPs, OPPs and total PCBs	Glass with Teflon Lid	4^oC [1]	14 days
Asbestos	Sealed Plastic Bag	Nil	N/A

Table QC2 - Containers, Preservation Requirements and Holding Times - Water			
Parameter	Container Volume (mL)	Preservation	Maximum Holding Time
Heavy Metals	125mL Plastic	Field filtration 0.45μm HNO_3 / 4^oC	6 months
Cyanide	125mL Amber Glass	pH > 12 NaOH / 4^oC	6 months
TPH (C6-C9) / BTEX / VOCs SVOCs / CHCs	4 x 43mL Glass	HCl / 4^oC [1]	14 days
TPH (C10-C36) / PAH / Phenolics OCP / OPP / TDS / pH	3 x 1L Amber Glass	None / 4^oC [1]	28 days

Notes: [1] = Extraction within 14 days, Analysis within 40 days.

Table QC3 - Analytical Parameters, PQLs and Methods - Soil			
Parameter	**Unit**	**PQL**	**Method Reference**
Metals in Soil			
Arsenic - As[1]	mg / kg	1	USEPA 200.7
Cadmium - Cd[1]	mg / kg	0.5	USEPA 200.7
Chromium - Cr[1]	mg / kg	1	USEPA 200.7
Copper - Cu[1]	mg / kg	1	USEPA 200.7
Lead - Pb[1]	mg / kg	1	USEPA 200.7
Mercury - Hg[2]	mg / kg	0.1	USEPA 7471A
Nickel - Ni[1]	mg / kg	1	USEPA 200.7
Zinc - Zn[1]	mg / kg	1	USEPA 200.7
Total Petroleum Hydrocarbons (TPHs) in Soil			
C_6-C_9 fraction	mg / kg	25	USEPA 8260
C_{10}-C_{14} fraction	mg / kg	50	USEPA 8000
C_{15}-C_{28} fraction	mg / kg	100	USEPA 8000
C_{29}-C_{36} fraction	mg / kg	100	USEPA 8000
BTEX in Soil			
Benzene	mg / kg	1	USEPA 8260
Toluene	mg / kg	1	USEPA 8260
Ethylbenzene	mg / kg	1	USEPA 8260
m & p Xylene	mg / kg	2	USEPA 8260
o- Xylene	mg / kg	1	USEPA 8260
Other Organic Contaminants in Soil			
PAHs	mg / kg	0.05-0.2	USEPA 8270
CHCs	mg / kg	1	USEPA 8260
VOCs	mg / kg	1	USEPA 8260
SVOCs	mg / kg	1	USEPA 8260
OCPs	mg / kg	0.1	USEPA 8140, 8080
OPPs	mg / kg	0.1	USEPA 8140, 8080
PCBs	mg / kg	0.1	USEPA 8080
Phenolics	mg / kg	5	APHA 5530
Asbestos			
Asbestos	mg / kg	Presence / Absence	AS4964-2004

Notes:

1. Acid Soluble Metals by ICP-AES
2. Total Recoverable Mercury

Table QC4 - Analytical Parameters, PQLs and Methods - Groundwater

Parameter	Unit	PQL	Method
Heavy Metals			
Antimony - Sb	µg/L	1	USEPA 200.8
Arsenic - As	µg/L	1	USEPA 200.8
Beryllium - Be	µg/L	0.5	USEPA 200.8
Cadmium - Cd	µg/L	0.1	USEPA 200.8
Chromium - Cr	µg/L	1	USEPA 200.8
Cobalt - Co	µg/L	1	USEPA 200.8
Copper - Cu	µg/L	1	USEPA 200.8
Lead - Pb	µg/L	1	USEPA 200.8
Mercury - Hg	µg/L	0.5	USEPA 7471A
Molybdenum - Mo	µg/L	1	USEPA 200.8
Nickel - Ni	µg/L	1	USEPA 200.8
Selenium - Se	µg/L	1	USEPA 200.8
Silver - Ag	µg/L	1	USEPA 200.8
Tin (inorg.) - Sn	µg/L	1	USEPA 200.8
Nickel - Ni	µg/L	1	USEPA 200.8
Zinc - Zn	µg/L	1	USEPA 200.8
Total Petroleum Hydrocarbons (TPHs)			
C_6-C_9 fraction	µg/L	10	USEPA 8220A / 8000
C_{10}-C_{14} fraction	µg/L	50	USEPA 8000
C_{15}-C_{28} fraction	µg/L	100	USEPA 8000
C_{29}-C_{36} fraction	µg/L	100	USEPA 8000
BTEX			
Benzene	µg/L	1	USEPA 8220A
Toluene	µg/L	1	USEPA 8220A
Ethylbenzene	µg/L	1	USEPA 8220A
m- & p-Xylene	µg/L	2	USEPA 8220A
o-Xylene	µg/L	1	USEPA 8220A
Polyciclic Aromatic Hydrocarbons (PAHs)			
PAHs	µg/L	0.1	USEPA 8270
Benzo(a)pyrene	µg/L	0.01	USEPA 8270
OrganoChlorine Pesticides (OCPs)			
Aldrin	µg/L	0.001	USEPA 8081
Chlordane	µg/L	0.001	USEPA 8081
DDT	µg/L	0.001	USEPA 8081
Dieldrin	µg/L	0.001	USEPA 8081
Endosulfan	µg/L	0.001	USEPA 8081
Endrin	µg/L	0.001	USEPA 8081
Heptachlor	µg/L	0.001	USEPA 8081
Lindane	µg/L	0.001	USEPA 8081
Toxaphene	µg/L	0.001	USEPA 8081

Parameter	Unit	PQL	Method
Chlorinated Hydrocarbons (CHCs)			
1,2-dichlorobenzene	µg/L	1	USEPA 8260B
1,3-dichlorobenzene	µg/L	1	USEPA 8260B
1,4-dichlorobenzene	µg/L	1	USEPA 8260B
1,2,3-trichlorobenzene	µg/L	1	USEPA 8260B
1,2,4-trichlorobenzene	µg/L	1	USEPA 8260B
Hexachlorobutadeine	µg/L	1	USEPA 8260B
1,1,2-trichloroethane	µg/L	1	USEPA 8260B
Hexachloroethane	µg/L	10	USEPA 8270D
Other CHCs	µg/L	1	USEPA 8260B
Volatile Organic Compounds (VOCs)			
Aniline	µg/L	10	USEPA 8260B
2,4-dichloroaniline	µg/L	10	USEPA 8260B
3,4-dichloroaniline	µg/L	10	USEPA 8260B
Nitrobenzene	µg/L	50	USEPA 8260B
2,4-dinitrotoluene	µg/L	50	USEPA 8260B
2,4,6-trinitrotoluene	µg/L	50	USEPA 8260B
Phenolic Compounds			
Phenol	µg/L	10	USEPA 8041
2-chlorophenol	µg/L	10	USEPA 8041
4-chlorophenol	µg/L	10	USEPA 8041
2, 4-dichlorophenol	µg/L	10	USEPA 8041
2,4,6-trichlorophenol	µg/L	10	USEPA 8041
2,3,4,6-tetrachlorophenol	µg/L	10	USEPA 8041
Pentachlorophenol	µg/L	10	USEPA 8041
2,4-dinitrophenol	µg/L	10	USEPA 8041
Miscellaneous Parameters			
Total Cyanide	µg/L	5	APHA 4500C&E-CN
Fluoride	µg/L	10	APHA 4500 F-C
Salinity (TDS)	mg/L	1	APHA 2510
pH	units	0.1	APHA 4500H+
OrganoPhosphate Pesticides (OPPs)			
Azinphos Methyl	µg/L	0.01	USEPA 8141
Chloropyrifos	µg/L	0.01	USEPA 8141
Diazinon	µg/L	0.01	USEPA 8141
Dimethoate	µg/L	0.01	USEPA 8141
Fenitrothion	µg/L	0.01	USEPA 8141
Malathion	µg/L	0.01	USEPA 8141
Parathion	µg/L	0.01	USEPA 8141
Temephos	µg/L	0.01	USEPA 8141
Polychlorinated Biphenyls (PCBs)			
Individual PCBs	µg/L	0.01	USEPA 8081

Table QC5 - QC Sample Data Acceptance Criteria

QC Sample Type	Method of Assessment	Acceptable Range
Field QC		
Blind Duplicates and Split Samples	The assessment of split duplicate is undertaken by calculating the Relative Percent Difference (RPD) of the duplicate concentration compared with the primary sample concentration. The RPD is defined as: $RPD = 100 \times \frac{\lvert X_1 - X_2 \rvert}{\text{mean}(X1, X2)}$ Where: X_1 and X_2 are the concentrations of the primary and duplicate samples.	The acceptable range depends upon the levels detected: - 0-150% RPD (when the average concentration is <5 times the LOR/PQL) - 0-75% RPD (when the average concentration is 5 to 10 times the LOR/PQL) - 0-50% RPD (when the average concentration is >10 times the LOR/PQL)
Rinsate & Trip Blanks	Each blank is analysed as per the original samples.	Analytical Result <LOR/PQL
Laboratory prepared Trip Spike	The Trip Spike is analysed after returning from the field and the % recovery of the known spike is calculated.	70 - 130%
Laboratory QC		
Laboratory Duplicates	Assessment of Lab Duplicate RPD as per Blind Duplicates and Split Samples.	Lab Duplicate RPD < 15% (Inorganics) Lab Duplicate RPD < 30% (Organics) for sample results > 10 LOR
Surrogates	Assessment is undertaken by determining the percent recovery of the known surrogate spike (SS) or addition to the sample.	at least 2 SS recoveries to be within 70-130% subject to matrix effects (Organics)
Matrix Spikes Laboratory Control Samples	$\%\ \text{Recovery} = 100 \times \frac{C - A}{B}$ Where: A = Concentration of analyte determined in the original sample; B = Added Concentration; and C = Calculated Concentration.	80-120% (Inorganics / Metals) 60-140% (Organics) 10-140% (SVOC and Speciated Phenols) If the result is outside the above ranges, the result must be <3x Standard Deviation of the Historical Mean (calculated over the past 12 months).
Sample Matrix Spike Duplicates	Recovery RPD	<30% (Inorganics & Organics)
Calibration Check Standards	Continuous Calibration Verification (CCV)	CCV must be within ±15% (inorganics) CCV must be within ±25% (inorganics)
Reagent, Method & Calibration Check Blanks	Each blank is analysed as per the original samples.	Analytical Result <LOR/PQL

Note: PQL - Laboratory Practical Quantitation Limit (PQL) or the minimum detection limit for a particular analyte.
LOR = Limit of Reporting

1 OBJECTIVE

This procedure will be used by the laboratory to comply with NEPM requirements for QA/QC reporting (and is typical of other regulatory requirements).

This procedure is applicable to all Environmental samples eg from Environmental Consultants. Samples from non-Environmental Consultants such as Councils, mines or trade waste etc do not necessarily have to conform with these requirements, however, it will be the Envirolab Group's default policy that this procedure be used whenever possible.

2 DEFINITIONS

Duplicate

This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Blank

This is the component of the analytical signal which is not derived from the sample but from reagents, glassware, instrument etc, can be determined by processing solvents, acids and reagents in exactly the same manner as for samples. Other terms cited in literature, but not used here include: Reagent Blank, Control Blank, Method Blank.

Matrix Spike

A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist. Other terms cited in literature include Laboratory Fortified Matrix. It is suggested that the spiking concentration be near the middle of the working calibration range.

Surrogate Spike

Surrogates are known additions to each standard, sample, blank, matrix spike and LCS in a process batch, of compounds which are similar to the analyte of interest in terms of:

a) extraction
b) recovery through clean up procedures
c) response to chromatography or other determinations

but which:

d) are not expected to be found in real samples
e) will not interfere with quantification of any analyte of interest
f) may be separately and independently quantified

These are only applicable to organic testing.

Internal Standards

Internal standards are used to check the consistency of the analytical step (e.g. injections, retention times, potential instrument suppression/enhancement etc) and provide a reference against which results may be adjusted in case of variation. For many organic and metals analyses, internal standards are added after all extraction, cleanup and concentration steps, to each final extract solution/sample/standard.

LCS (Laboratory Control Sample)

This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample. Other terms cited in literature include: laboratory control standard, quality control check sample, laboratory fortified blank.

Process Batch

A group of samples which behave similarly with respect to the sampling or the testing procedures being employed and which are processed as a unit for QC purposes. It is important that all factors within a process batch be the same. If any factors change e.g. reagents, staff, standards then a new process batch is deemed to have begun. A process batch is considered to be ≤20 samples.

Percent Recovery

Percent recovery describes the capability of the method to recover a known amount of analyte added to the sample.

% Recovery = C-A / B x 100

where: A = natural concentration of analyte in the sample
B = concentration of analyte added to the sample
C = concentration of analyte determined in the spiked sample

RPD (Relative Percent Difference)

This calculation measures the precision between two figures. Commonly used to compare the precision of Duplicate results.

% RPD = ((Highest – Lowest)/Average) x 100

3 QC REQUIRED AND WHAT IS REPORTED

The following QC is required for all Environmental Samples, unless justified otherwise by a Manager/Supervisor.

Blank

At least one per process batch.
The Blanks must be labelled throughout the day e.g.: Blk_1, Blk_2 etc.
The Blank is analysed at a rate of one per ≤20 samples.

LCS

At least one per process batch.
The LCS's must be labelled throughout the day e.g.: LCS_1, LCS_2 etc.
The LCS is reported to all clients at a rate of one per ≤20 samples.

Duplicate

At least one per ten samples i.e. a Duplicate is carried ≤ 10 samples.
So, if there is one process batch of 100 samples there will be at least 10 Duplicates.
There are instances where there is insufficient sample for a duplicate analysis and hence the

frequency will not apply, however, every effort will be made to perform a duplicate in each process batch (water volumes supplied for VOC and SVOC are often insufficient).

The Duplicate is only reported to the client if it is performed on their sample.

Matrix Spike

One for each soil/water/air sample (where applicable) type e.g.: if a batch contains soils/waters/air samples then a matrix spike must be done on each sample type at a frequency of 5%, typically a matrix spike is carried out where ≥5 samples and then every 20.

The sample type is generally recorded on the Chain of Custody. If a client calls all samples 'soil' then we will treat all samples as 1 sample type (unless they are very obviously different).
If there is only one sample type e.g. soil, then a matrix spike is performed every 20 samples.

There is no requirement in NEPM for a Matrix Spike Duplicate.

The Matrix Spike is only reported to the client if it is performed on their sample.

Certified/Standard Reference Materials

Where available, CRMs/SRMs are analysed (particularly during validation/verification). Due to the high cost and lack of stability of many CRMs/SRMs, the frequency of analysis is relatively low. Typically SRMs are run for Metals only (e.g. AGAL series 6, 10, 12 for example) as they are cost effective and stable over a long period of time. Therefore once a week or once a month is not uncommon.

4 ACCEPTANCE CRITERIA

If QC fails, take corrective action promptly to determine and eliminate the source of the error. Do not report data until the cause of the problem is identified and either corrected or qualified by a supervisor.

Matrix Spikes

As a general rule, the recoveries of most analytes spiked into samples should fall within the range 60% - 140% and this range should be used as a guide in evaluating in house performance, exceptions exist within individual methods. (*see tables 1-3 below for global acceptance criteria*).

Matrix Spikes will regularly fail, often due to matrix interferences. If a Matrix Spike fails it should be investigated:

a) check calculations and transcriptions to ensure a mistake has not been made.

b) look at the background concentration of the sample. If sample background is high then recovery can be affected (sample heterogeneity). A useful rule of thumb is where background concentration of an analyte is >3* the spike level then the spike recovery is n/a, however, where the sample is very non-homogenous acceptable spike recovery may be difficult. As long as the LCS is acceptable (*see below*) then the Process Batch will be accepted.

c) If the LCS has also failed then the Process Batch is deemed to have failed and data should not be reported unless justified. The batch should be repeated after consultation with the supervisor, possibly replacing standards or reagents (see guidelines below).

If a matrix spike has failed yet the process batch has been accepted by the supervisor, the failed

matrix spike should still be reported to the client (unless the spiked sample has very high background levels). This should be accompanied by an appropriate comment such as 'percent recovery not available due to significant background levels of analyte in the sample' or 'the matrix spike recovery was outside recommended acceptance criteria, however, an acceptable recovery was achieved for the LCS. This indicates a sample matrix interference'.

Matrix spikes are not carried out for all tests. These exceptions are mainly the inorganic tests such as TSS, pH, EC etc. and OHS samples (tubes/badges/filters/swabs etc) where all the sample is extracted as opposed to a portion. In these cases an acceptable LCS is required.

Matrix spikes are also not reported for all analytes. For example in a SVOC run of >100 analytes it is acceptable to only spike a range of analytes e.g. some PAHs, some OCP, some OPP, some speciated Phenols etc.

Duplicates

Acceptable Duplicate data is judged by % RPD.

See tables 1-3 below for acceptance criteria, the acceptance criteria will increase as the analyte concentration approaches the PQL as measurement uncertainty will become a more significant factor.

If a water duplicate fails then repeat the analysis (if there is sufficient sample left). If the RPD% fails again it is likely to be due to a non-homogeneity or a matrix issue and an appropriate comment should be applied to the report such as 'the duplicate is outside acceptable %RPD, re-analysis indicates possible sample heterogeneity'. All failed duplicate results should be reported, a triplicate should be reported to illustrate analyte variability where applicable. *Poor reproducibility for water samples is rare unless the sediment loading is significant*.

If a soil duplicate fails then it should be repeated (if there is sufficient sample left). If the RPD% fails again it is likely to be due to a matrix non-homogeneity issue and an appropriate comment should be applied to the report such as 'the duplicate is outside acceptable %RPD, reanalysis indicates possible sample heterogeneity'. All failed duplicate results should be reported and a triplicate should be reported to illustrate analyte variability where applicable. Soil matrices are a common issue with poor analyte precision given samples are typically prepared field moist

If an air duplicate fails then it should be repeated (if there is sufficient sample left). Duplicates for air samples are only applicable for canister and air sample (tedlar) bag analyses, precision failures should be rare given the relative simplicity of the matrix, however variation will be higher near reporting limits (PQL).

Internal Standards

Acceptance criteria for internal standards are 70-130% for Metals and 50-150% for Organics, note exceptions may exist in individual methods – see tables 1 and 3 below.

If internal standards exceed this criteria they will need to be either re-vialed and re-run for organics or diluted and re-run for metals. If they continue to fail consult the supervisor.

Surrogates

Surrogate recoveries should generally be within the range of 60-140%, table 3 below.

High analyte concentrations may cause surrogates to fail – this needs to be annotated on the final report (e.g. for svTRH).

The surrogate recovery in BLKs and LCSs should be within Global Acceptance Criteria (GAC) or Analyte Specific Acceptance Criteria (ASAC) for labile surrogates (e.g. d5-phenol etc.). The GAC and ASAC are discussed in more detail below.

Certified/Standard Reference Materials

CRMs/SRM recoveries should generally be within the range of 70-130%. Some certified levels are below or within 10*PQL and therefore ±30% tolerance is not achievable on all instruments (e.g. some elements in AGAL12 will struggle with this criteria on ICP-OES but should be achieved on ICP-MS due to higher uncertainty based on PQL differences for the two instruments).

Global Acceptance Criteria (GAC) for Matrix Spikes, LCS and BLKS

The criteria specified below covers >90% of the analytes determined by the laboratory, however due to limitation of the methodology and/or the labile nature of some analytes there are analytes whose recovery is outside of this acceptance criteria (GAC). Therefore ***Analyte Specific Acceptance Criteria*** (ASAC) is applied for these analytes. The ASAC is determined from 6-12 months of LCS recovery data and is Defined as 3 x std dev from the mean LCS recovery %.

See GAC in the tables below.

Table 1 – Metals GAC

	ICV	CCV	Internal Standards	LCS	PQL std	Calibration Blank	Matrix Spikes#	%RPD≥ 10*PQL@	5*PQL≤*sample* %*RPD*<10*PQL@	%RPD<5*PQL
Dissolved Waters	±10%	±20%	70-130%	±20%	±50%	<1/2*PQL std	±30%	20	50	any
Impingers	±10%	±20%	70-130%	±20%	±50%	<1/2*PQL std	±30%	30	50	any
Total Waters	±10%	±20%	70-130%	±20%	±50%	<1/2*PQL std	±30%	30	50	any
Soils/Paint/Filters (if cut in pieces)	±10%	±20%	70-130%	±30%	±50%	<1/2*PQL std	±30%	40	50	any

n/a where background is ≥ 3* spike level
@ where an original and duplicate result are above and below a cut off (5* and 10*PQL), then the mean of the two defines the criteria used.

Table 2 – Inorganics GAC

	ICV (LCS in many cases)	CCV	PQL std	Calibration Blank	LCS	Matrix Spikes#	%RPD≥10*PQL@	5*PQL≥*sample %RPD*<10*PQL@	%RPD<5*PQL
Waters - Nutrients no preparation	±20%	±20%	±50%	<1/2*PQL std	±20%	±30%	20	50	any
Waters digested/distilled	±20%	±20%	±50%	<1/2*PQL std	±20%	±30%	30	50	any
Impingers	±20%	±20%	±50%	<1/2*PQL std	±20%	±30%	30	50	any
Soils/Filters (if cut in pieces)	±20%	±20%	±50%	<1/2*PQL std	±30%	±30%	30	50	any

n/a where background is ≥ 3* spike level
@ where an original and duplicate result are above and below a cut off (5* and 10*PQL) then the average defines the criteria used.

Table 3 - Organics (includes Air Toxics unless specified in the method) GAC (TD tubes are an exception for field duplicates)

	ICV (LCS in many cases)	CCV*	Internal Stds	PQL std	Calibration Blank	LCS$	Matrix Spikes#$ and Surrogates	%RPD≥5*PQL (although sampling may be the source of error)	%RPD<5*PQL
Waters/Air Toxic - VOC	±20%	±20%	50-150%	±50%	n/a	±20%	±40%	30	any
Waters extracted	±20%	±20%	50-150%	±50%	n/a	±40%	±40%	50	any
Soils	±20%	±20%	50-150%	±50%	n/a	±40%	±40%	50	any

n/a where background is ≥ 3* spike level
$ - there will be exception to this rule as some analytes are particularly labile and recovery as low as 10% has been documented in the literature (see ASAC).

@ where an original and duplicate result are above and below a cut off (5* and 10*PQL) then the average defines the criteria used.

See MICRO/ASBESTOS and ASS methods for acceptance criteria in those sections.

Decision Path for LCS

As a general rule, the recoveries of most LCS's should fall within the ranges specified in the tables above.

If an LCS fails it should be investigated:-

a) check calculations and transcriptions to ensure a basic mistake has not been made.

b) If all other QC has passed, repeat the LCS analysis. If the LCS fails again it should be re-made and re-analysed.

c) If the LCS fails after the second attempt there could be a problem with the LCS and hence the procedure – consult the supervisor.

If the failure is specific to the LCS then the Process Batch may be acceptable, if not, then repeat the process batch (if sufficient sample available). If insufficient sample is available then the data must be qualified with respect to the LCS result (for example a surrogate is half the expected value for all samples and LCS, this may be due to a setting on a pipette and is not reflective of poor extraction efficiency).

d) If the LCS fails the criteria in the GAC tables above, then compare to the ASAC for the individual analytes (i.e. 3 x stdev of LCS over 6-12 months). If within these criteria then the LCS is acceptable as long as above 10% recovery. Recovery below this limit implies the analytical method in not fit for purpose and hence the data must be qualified accordingly if reported.

There should be an LCS available for >99% of tests (exceptions include Asbestos for example).

Practical Quantitation Limit Checks (PQLs)

As can be seen from the tables above, a PQL standard run in the calibration or as a sample can be used to confirm the ability to determine the PQL on a sequence by sequence basis. This negates the need for MDL studies as the PQL is confirmed for each analytical sequence.

5 CHECKING THE CORRECTNESS OF ANALYSIS (see also form 346)

Anion Cation Balance

The anion and cation sums, when expressed as milliequivalents per litre, must approximately balance because all potable waters are electrically neutral.

As a minimum ion balance is determined from cations:-Na/Ca/Mg/K and anions:- Alk/Cl/SO_4.

The full calculation can be found in APHA and Form 213 - Mass Balance Calculation sheet can be used to determine the ion balance in Excel.

The acceptance criteria in APHA are very strict as they are based on potable water. The environmental waters we receive could rarely be termed potable so our % Difference has been determined to be ±15%, with supervisor discretion.

If the % is >15% for “cation total Meq vs anion total Meq” then there is a possibility of gross error and reruns/checks may be necessary. If the result is confirmed then an appropriate comment must accompany the report such as ‘the mass imbalance may be caused by other ions that have not been measured’. Extremes of pH can also cause an imbalance.

TDS v Ions

Measured TDS should be similar or greater than ion calculated TDS. This is because the calculation will normally not involve ions such as F, Si, NO_3 etc.

Note, as a guide in mg/L:-

0.6(alk) + Cl + SO_4 + Na + Ca + Mg + K + = Approx TDS.

Measured EC and Ion sums

Both the anion & cation sums (expressed as meq) should be 1/100 of the measured EC value. If either of the 2 sums does not meet this criteria, that sum is suspect.

The calculation is: 100 x anion (or cation sum) meq/L = (0.9-1.1 EC).

The full calculation can be found in APHA or use the spreadsheet i.e. Form 213 - Mass Balance Calculation sheet v1. Note another useful rule of thumb is that Chloride (mg/L) is $^1/_3$ of EC.

Measured TDS to EC Ratio

EC x (0.55-0.7) = TDS.

If it is outside this criteria one of the tests may be suspect. The exception is waters with high colloidal particulates that may contribute to a higher measured TDS result.

Metals – Total Recoverable v Dissolved.

In theory Total recoverable metals must be equal or higher than dissolved metals for the same water sample. If the difference is within the uncertainty of the individual tests then this should be noted on the worksheets. If the difference is outside the uncertainty of the individual tests then one of the results is suspect and should be re-analysed for confirmation/denial.

Metals – CrVI vs total dissolved Cr and FeII vs total dissolved Fe

The sample preservation for hexavalent Chromium, Ferrous Iron and the total dissolved Chromium and Iron are from different preservations. Hence different bottles are used during sampling which can lead to variations in results given:-

$Cr^{VI} \leq$ total dissolved Cr and $Fe^{II} \leq$ total dissolved Fe (taking into account some MU in analysis)

A common source of error is where samples for Cr^{VI} and Fe^{II} are not field filtered (into caustic and HCl preserved containers respectively), whereas the total dissolved metals are field filtered into HNO_3 preserved bottles. Therefore interaction with sediment can lead to higher Cr^{VI} and Fe^{II} numbers than would be given if filtered. Therefore, where this occurs a note should be recorded on the report and/or communicated to the customer/sampler.

Organics

Some simple checks to be aware of include:

C_6-C_{10} should generally be greater than BTEX.

>C_{10}-C_{36} should generally be greater than PAH.

Naphthalene in the VOC run should be similar to PAH (SVOC) run, however where the soil is non-homogenous then poor precision may exist. Additionally two different solvent mixes are used which can lead to variability in extraction efficiency.

Nutrients

TKN should be greater than or equal to Ammonia. If the difference is within the uncertainty of the individual tests then this should noted on the worksheets. If the difference is outside the uncertainty of the individual tests then one of the results is suspect and should be reanalysed for confirmation/denial. Use of different bottle for TKN and Ammonia can cause anomalies do to sampling variability.

See form 346 for more detail on checking correctness of data.

6 CONTROL CHARTS

Control Charts can be generated from LIMS as required. LCS data is used to construct these charts. LCS data is a good indication of the health of the method.

Matrix spike and duplicate data can vary significantly due to the nature of certain matrices so are not considered an ideal measure. If a MS result is grossly out due to a known interference then control data will be invalidated as the result is an outlier.

Control charts can used to monitor trends and should alert the analyst to potential problems. In theory all plotted data should lie within 2SD (Warning Limits =WL) of the mean or within the target recovery (e.g. GAC and ASAC recovery limits discussed above).

Results outside the CL or outside the target recovery (e.g. GAC and ASAC recovery limits discussed above) should not be accepted unless there is a valid, documented reason.

7 STANDARDS / CALIBRATIONS

Calibration standards are purchased either in commercial mixes that are traceable to NIST (wherever possible with CoAs) and/or as neat compounds/salts. Where possible, purity of neat compounds/salts is >>95% (as high as available but still cost effective). Standards used for calibration are prepared (working standards) as required and allocated a shelf life in accordance with the methods (in house and via international standards) and in consultation with approved suppliers and senior staff experience.

Calibration standards are verified by an independently sourced standard (where available) as described within individual methods. Standards that are used beyond the specified shelf-life (e.g. the default shelf-life for many commercial standards) must be verified by a standard that is within the specified shelf-life.

Note, inorganic salts with purity >>95% (>99% preferable) typically have a shelf life >10 years (the shelf life is typically not specified by the supplier). The standards from such salts are checked versus other sources of analyte regardless, for example a working standard from a $NaNO_3$ salt (as a Nitrate source) could be confirmed as acceptable for use by checking versus a working standard prepared from a KNO_3 salt (or a commercial mix of NO_3 where a CoA is supplied).

Calibration

In general calibrations are linear or linear through zero (i.e. through the blank). Exceptions to this rule occur where the chemistry is non-linear (e.g. some colourimetric chemistry) and quadratic fits can be used. Another example would be for labile Organic analytes where, for example, breakdown and/or adsorption effects become significant, therefore quadratic fits become necessary.

Calibration curves are constructed for each daily sequence for most instrumentation, the

exceptions would be for some colourimetric chemistries where the reagents are very stable (e.g. NH_3/NO_3/PO_4/CrVI/TKN) and also for some GC-MS/ECD analyses where acceptable response is maintained for all analytes (can be confirmed with PQL standard analyses and S/N observation). To confirm the validity of the calibration curves an Independent Calibration Check (ICV) is run with a tolerance of ±20% of expected result (as described below).

For most methods an Independent Calibration Check (ICC or ICV where V = verification) is analysed straight after the calibration. This should be an independent check (i.e. made from another standard source) and acceptance is defined in the tables 1-3 in section 4 above. If it is outside this acceptance criteria, a new calibration may be necessary and/or calibration standards should be re-prepared and/or the Independent Calibration Check should be re-prepared.

Results may only be reported if within the calibration range (exceptions include ICPOES/IC/FID where linearity way beyond the top standard has been demonstrated in validation data). Results +10% beyond the top standard are acceptable in general where linear calibrations are used, *not* where quadratics are used.

The correlation coefficient (R^2) should be >0.995 for the vast majority of analytes (individual methods may have specific criteria). Where failures occurs, calibration points may be removed as a last resort (e.g. for a poor injection where internal standards are indicative) and should be a rarity as opposed to normal practice. In general 3-5 calibration standards are used to generate a response curve and/or a Continuing Calibration Verification (CCV) standard is run to ensure signal to noise is maintained.

Continuing Calibration
A continuing calibration is analysed approximately every 20 samples and at the end of the run. Acceptance should be ±20%. If it is outside this acceptance a new calibration will be necessary (the ability to maintain the detection limit (PQL) is a requirement i.e. run the PQL standard as described above with the required acceptance criteria (tables 1-3)).

New v's Old Standard Checks
New standards should always be compared to the old with an acceptance of ±10%.

Expired Standards

Standards that have expired may still be used, however, need to be verified against another in date standard, CRM or confirmed by another lab. The expiry date may then be extended a further 6 months (or less as deemed appropriate). For some analytes, such as metals, extending the expiry date for many years may be acceptable as there is known stability.

8 Intralaboratory Check Samples

Soils –

Internally prepared reference materials can be used to check the validity of analysis. Typically for soil, customer samples are collated and are then air dried, homogenised and sieved. The analyte concentrations are then determined by analysing 7-10 replicates to achieve a mean with an RSD%$\leq$30% (although concentration dependant). The results can then be internally (Melbourne ↔ Perth ↔ Sydney lab) verified and/or externally verified with another NATA accredited facility.

Once an acceptable mean and acceptance criteria has been established (professional judgement of the senior chemists can be utilised here), then the material can then be analysed periodically to check laboratory performance. Alternatively, if available, confirm against a CRM/SRM.

Other non-certified reference materials can be used to assess laboratory performance if suitably verified data has been generated (e.g. ELIG soil where 10 labs participated in generating data).

Waters –

The R&D Manager or delegate will periodically prepare QC samples for an ILCP between the labs in the Envirolab Group. Samples may be prepared from standard solutions, independant check solutions and/or solutions remaining from previous proficiency programs (stability may have to be ascertained. These solutions will generally be of known concentration.

Spike solutions using products may also be prepared for comparison purposes e.g. petrol for TRH/BTEX or Diesel for PAHs etc.

Table QC1 - Containers, Preservation Requirements and Holding Times - Soil			
Parameter	Container	Preservation	Maximum Holding Time
Acid digestible metals and metalloids - Total and TCLP (As,Cd.,Cu,Cr,Ni,Pb,Zn)	Glass with Teflon Lid	Nil	6 months
Mercury	Glass with Teflon Lid	Nil	28 days
TPH / BTEX / VOC / SVOC / CHC	Glass with Teflon Lid	4°C, zero headspace	14 days
PAHs (total and TCLP)	Glass with Teflon Lid	4°C [1]	14 days
Phenols	Glass with Teflon Lid	4°C [1]	14 days
OCPs, OPPs and total PCBs	Glass with Teflon Lid	4°C [1]	14 days
Asbestos	Sealed Plastic Bag	Nil	N/A

Table QC2 - Containers, Preservation Requirements and Holding Times - Water			
Parameter	Container Volume (mL)	Preservation	Maximum Holding Time
Heavy Metals	60mL Plastic	Field filtration 0.45µm HNO_3 / 4°C	6 months
Mercury	60mL Plastic	Field filtration 0.45µm HNO_3 / 4°C	~~6 months~~ 28 days
Cyanide	125mL Amber Glass or 125mL Opaque HDPE	pH > 12 NaOH / 4°C	~~6 months~~ 14 days
TPH (C6-C9) / BTEX / VOCs SVOCs / CHCs	4 x 44mL Glass	HCl / 4°C [1] or Sodium Bisulphate	14 days
TPH (C10-**C40**) / PAH / Phenolics OCP / OPP / TDS / pH	3 x 1L Amber Glass	None / 4°C [1]	28 days (TDS is 7 days, pH is ideally a field test and should be analysed ASAP)

Notes: [1] = Extraction within 14 days, Analysis within 40 days.

Table QC3 - Analytical Parameters, PQLs and Methods - Soil *(Routine Levels)*			
Parameter	**Unit**	**PQL**	**Method Reference**
Metals in Soil			
Arsenic - As[1]	mg / kg	4	USEPA 200.7 (also reference USEPA 6010C and 3050)
Cadmium - Cd[1]	mg / kg	0.4	USEPA 200.7 (also reference USEPA 6010C and 3050)
Chromium - Cr[1]	mg / kg	1	USEPA 200.7 (also reference USEPA 6010C and 3050)
Copper - Cu[1]	mg / kg	1	USEPA 200.7 (also reference USEPA 6010C and 3050)
Lead - Pb[1]	mg / kg	1	USEPA 200.7 (also reference USEPA 6010C and 3050)
Mercury - Hg[2]	mg / kg	0.1	USEPA 7471A (also reference USEPA 3050)
Nickel - Ni[1]	mg / kg	1	USEPA 200.7 (also reference USEPA 6010C and 3050)
Zinc - Zn[1]	mg / kg	1	USEPA 200.7 (also reference USEPA 6010C and 3050)
Total Petroleum Hydrocarbons (TRHs) in Soil			
old fractions			
C_6-C_9 fraction	mg / kg	25	USEPA 8260
C_{10}-C_{14} fraction	mg / kg	50	USEPA 8000
C_{15}-C_{28} fraction	mg / kg	100	USEPA 8000
C_{29}-C_{36} fraction	mg / kg	100	USEPA 8000
NEPM 2013 Fractions			
C_6-C_{10} fraction	mg / kg	25	USEPA 8260
$>C_{10}$-C_{16} fraction	mg / kg	50	USEPA 8000
$>C_{16}$-C_{34} fraction	mg / kg	100	USEPA 8000
$>C_{34}$-C_{40} fraction	mg / kg	100	USEPA 8000
BTEX in Soil			
Benzene	mg / kg	0.2	USEPA 8260
Toluene	mg / kg	0.5	USEPA 8260
Ethylbenzene	mg / kg	0.5	USEPA 8260
m & p Xylene	mg / kg	1	USEPA 8260
o- Xylene	mg / kg	0.5	USEPA 8260
Other Organic Contaminants in Soil			
PAHs	mg / kg	0.05-0.2	USEPA 8270
CHCs	mg / kg	1	USEPA 8260
VOCs	mg / kg	1	USEPA 8260
SVOCs	mg / kg	1	USEPA 8260
OCPs	mg / kg	0.1	USEPA 8140, 8080
OPPs	mg / kg	0.1	USEPA 8140, 8080
PCBs	mg / kg	0.1	USEPA 8080
Phenolics	mg / kg	5	APHA 5530
Asbestos			
Asbestos	mg / kg	Presence / Absence	AS4964-2004

Notes:

1. Acid Soluble Metals by ICP-AES
2. Total Recoverable Mercury

Table QC4 - Analytical Parameters, PQLs and Methods - Groundwater

Parameter	Unit	PQL	Method
Heavy Metals			
Antimony - Sb	µg/L	1	USEPA 200.8
Arsenic - As	µg/L	1	USEPA 200.8
Beryllium - Be	µg/L	0.5	USEPA 200.8
Cadmium - Cd	µg/L	0.1	USEPA 200.8
Chromium - Cr	µg/L	1	USEPA 200.8
Cobalt - Co	µg/L	1	USEPA 200.8
Copper - Cu	µg/L	1	USEPA 200.8
Lead - Pb	µg/L	1	USEPA 200.8
Mercury - Hg	µg/L	0.05	USEPA 7471A
Molybdenum - Mo	µg/L	1	USEPA 200.8
Nickel - Ni	µg/L	1	USEPA 200.8
Selenium - Se	µg/L	1	USEPA 200.8
Silver - Ag	µg/L	1	USEPA 200.8
Tin ~~(inorg.)~~ - Sn (all forms)	µg/L	1	USEPA 200.8
Nickel - Ni	µg/L	1	USEPA 200.8
Zinc - Zn	µg/L	1	USEPA 200.8
Total Petroleum Hydrocarbons (TRHs)			
C_6-C_9 fraction	µg/L	10	USEPA 8220A / 8000
C_{10}-C_{14} fraction	µg/L	50	USEPA 8000
C_{15}-C_{28} fraction	µg/L	100	USEPA 8000
C_{29}-C_{36} fraction	µg/L	100	USEPA 8000
NEPM 2013			
C_6-C_{10} fraction	µg/L	10	USEPA 8220A / 8000
>C_{10}-C_{16} fraction	µg/L	50	USEPA 8000
>C_{16}-C_{34} fraction	µg/L	100	USEPA 8000
>C_{34}-C_{40} fraction	µg/L	100	USEPA 8000
BTEX			
Benzene	µg/L	1	USEPA 8260
Toluene	µg/L	1	USEPA 8260
Ethylbenzene	µg/L	1	USEPA 8260
m- & p-Xylene	µg/L	2	USEPA 8260
o-Xylene	µg/L	1	USEPA 8260
Polyciclic Aromatic Hydrocarbons (PAHs)			
PAHs Level 2	µg/L	0.1	USEPA 8270
Benzo(a)pyrene Level 3	µg/L	0.01	USEPA 8270
OrganoChlorine Pesticides (OCPs) Trace Level			
Aldrin	µg/L	0.001	USEPA 8082A
Chlordane	µg/L	0.001	USEPA 8082A
DDT	µg/L	0.001	USEPA 8082A
Dieldrin	µg/L	0.001	USEPA 8082A
Endosulfan	µg/L	0.001	USEPA 8082A
Endrin	µg/L	0.001	USEPA 8082A
Heptachlor	µg/L	0.001	USEPA 8082A
Lindane	µg/L	0.001	USEPA 8082A
Toxaphene	µg/L	0.001	USEPA 8082A

Parameter	Unit	PQL	Method
Chlorinated Hydrocarbons (CHCs)			
1,2-dichlorobenzene	µg/L	1	USEPA 8260C
1,3-dichlorobenzene	µg/L	1	USEPA 8260C
1,4-dichlorobenzene	µg/L	1	USEPA 8260C
1,2,3-trichlorobenzene	µg/L	1	USEPA 8260C
1,2,4-trichlorobenzene	µg/L	1	USEPA 8260C
Hexachlorobutadeine	µg/L	1	USEPA 8260C
1,1,2-trichloroethane	µg/L	1	USEPA 8260C
Hexachloroethane	µg/L	10	USEPA 8270D
Other CHCs	µg/L	1	USEPA 8260C
Semi-Volatile Organic Compounds (SVOCs)			
Aniline	µg/L	10	USEPA 8270D
2,4-dichloroaniline	µg/L	10	USEPA 8270D
3,4-dichloroaniline	µg/L	10	USEPA 8270D
Nitrobenzene	µg/L	10	USEPA 8270D
2,4-dinitrotoluene	µg/L	10	USEPA 8270D
2,4,6-trinitrotoluene	µg/L	10	USEPA 8270D
Phenolic Compounds			
Phenol	µg/L	10	USEPA 8270D
2-chlorophenol	µg/L	10	USEPA 8270D
4-chlorophenol	µg/L	10	USEPA 8270D
2, 4-dichlorophenol	µg/L	10	USEPA 8270D
2,4,6-trichlorophenol	µg/L	10	USEPA 8270D
2,3,4,6-tetrachlorophenol	µg/L	10	USEPA 8270D
Pentachlorophenol	µg/L	10	USEPA 8270D
2,4-dinitrophenol	µg/L	100	USEPA 8270D
Miscellaneous Parameters			
Total Cyanide	µg/L	4	APHA 4500C&E-CN
Fluoride	µg/L	100	APHA 4500 F-C
Salinity (TDS)	mg/L	5	APHA 2510
pH	units	0.1	APHA 4500H+
OrganoPhosphate Pesticides (OPPs) Trace Level			
Azinphos Methyl	µg/L	0.01	USEPA 8082A/8270D
Chloropyrifos	µg/L	0.01	USEPA 8082A/8270D
Diazinon	µg/L	0.01	USEPA 8082A/8270D
Dimethoate	µg/L	0.01	USEPA 8082A/8270D
Fenitrothion	µg/L	0.01	USEPA 8082A/8270D
Malathion	µg/L	0.01	USEPA 8082A/8270D
Parathion	µg/L	0.01	USEPA 8082A/8270D
Temephos	µg/L	0.01	USEPA 8082A/8270D
Polychlorinated Biphenyls (PCBs) Trace Level			
Individual PCBs	µg/L	0.01	USEPA 8082A/8270D

Table QC5 - QC Sample Data Acceptance Criteria

QC Sample Type	Method of Assessment	Acceptable Range
Field QC		
Blind Duplicates and Split Samples	The assessment of split duplicate is undertaken by calculating the Relative Percent Difference (RPD) of the duplicate concentration compared with the primary sample concentration. The RPD is defined as: $RPD = 100 \times \frac{\lvert X_1 - X_2 \rvert}{\text{mean}(X1, X2)}$ Where: X_1 and X_2 are the concentrations of the primary and duplicate samples.	The acceptable range depends upon the levels detected: - 0-150% RPD (when the average concentration is <5 times the LOR/PQL) - 0-75% RPD (when the average concentration is 5 to 10 times the LOR/PQL) - 0-50% RPD (when the average concentration is >10 times the LOR/PQL)
Rinsate & Trip Blanks	Each blank is analysed as per the original samples.	Analytical Result <LOR/PQL
Laboratory prepared Trip Spike	The Trip Spike is analysed after returning from the field and the % recovery of the known spike is calculated.	70 - 130%
Laboratory QC		
Laboratory Duplicates	Assessment of Lab Duplicate RPD as per Blind Duplicates and Split Samples.	The acceptable range depends upon the levels detected: - Any RPD (when the average concentration is <5 times the PQL) - 0-50% RPD (when the average concentration is >5 times the PQL
Surrogates Matrix Spikes Laboratory Control Samples	Assessment is undertaken by determining the percent recovery of the known surrogate spike (SS) or addition to the sample. $\%\ \text{Recovery} = 100 \times \frac{C - A}{B}$ Where: A = Concentration of analyte determined in the original sample; B = Added Concentration; and C = Calculated Concentration.	60-140% (General Analytes) 70-130% (Inorganics / Metals) 60-140% (Organics) 10-140% (SVOC and Speciated Phenols) If the result is outside the above ranges, the result must be <3x Standard Deviation of the Historical Mean (calculated over the past 12 months).
Sample Matrix Spike Duplicates	Recovery RPD	<30% (Inorganics & Organics)
Method Blanks	Each blank is analysed as per the original samples.	Analytical Result <LOR/PQL

Note: PQL - Laboratory Practical Quantitation Limit (PQL) or the minimum detection limit for a particular analyte.
LOR = Limit of Reporting