REPORT TO

NSW HEALTH INFRASTRUCTURE

ON

PRELIMINARY (STAGE 1) SITE INVESTIGATION

FOR

PROPOSED MPS STAGE 5 DEVELOPMENT

AT

BLAYNEY DISTRICT HOSPITAL, 3 OSMAN STREET, BLAYNEY, NSW

Date: 22 December 2022
Ref: E35521PTrpt2

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Executive Summary

NSW Health Infrastructure ('the client') commissioned JK Environments (JKE) to undertake a Preliminary (Stage 1) Site Investigation (PSI) for the proposed MPS Stage 5 development at Blayney District Hospital, 3 Osman Street, Blayney, NSW ('the site'). The purpose of the investigation is to make a preliminary assessment of site contamination. The site location is shown on Figure 1 and the investigation was confined to the site boundaries as shown on Figure 2.

A geotechnical investigation was undertaken in conjunction with this PSI by JK Geotechnics (JKG). The results of the geotechnical investigation are presented in a separate report (Ref: 35521LFrpt). This report should be read in conjunction with the JKG report. JKE has previously undertaken a desktop PSI at the site. A summary of this information has been included in Section 2.

The proposed development is in the early planning stages and no proposed development plans/drawings have been provided. Based on the limited information provided, we understand that the proposed development would likely be constructed on grade, with minimal excavations for services trenches.

The primary aims of the investigation were to identify any past or present potentially contaminating activities at the site, identify the potential for site contamination, and make a preliminary assessment of the soil and groundwater contamination conditions. The objectives were to:

- Identify potential contamination sources/areas of environmental concern (AEC) and contaminants of potential concern (CoPC);
- Assess the soil and groundwater contamination conditions via implementation of a preliminary sampling and analysis program;
- Review and update the conceptual site model (CSM);
- Assess the potential risks posed by contamination to the receptors identified in the CSM (Tier 1 assessment);
- Provide a preliminary waste classification for off-site disposal of soil;
- Assess whether the site is suitable or can be made suitable for the proposed development (from a contamination viewpoint); and
- Assess whether further intrusive investigation and/or remediation is required.

The scope of work included the following:

- Review of desktop PSI and existing project information;
- Review and update the CSM;
- Design and implementation of a sampling, analysis and quality plan (SAQP);
- Interpretation of the analytical results against the adopted Site Assessment Criteria (SAC);
- Data Quality Assessment; and
- Preparation of a report including a Tier 1 risk assessment.

Potential AEC and contamination sources identified at the site included: fill material; fuel storage onsite [abandoned underground storage tanks (USTs) and aboveground storage tanks (AST)]; use of pesticides; hazardous building materials (former and existing buildings and structures); naturally occurring asbestos; and off-site land uses (upgradient ambulance station former UST and motor mechanic).

Soil sampling was undertaken from 10 boreholes and groundwater sampling from three monitoring wells installed at the site. The boreholes encountered fill materials to depths of approximately 0.3mBGL to 1.2mBGL, underlain by silty or clayey residual soils. The fill contained inclusions of brick and tile fragments, igneous, ironstone and sandstone gravel, clay nodules, slag, ash, coal and root fibres. There were no fibre cement fragments (FCF)/asbestos containing materials (ACM) identified in any of the bulk asbestos quantification field screening samples.

A selection of soil and groundwater samples were analysed for the CoPC. Chromium and asbestos [as asbestos fines/fibrous asbestos (AF/FA)] were identified in fill/soil at concentrations that exceeded the health based SAC. In groundwater, total recoverable hydrocarbons (TRH) F2 was reported above the health based SAC and zinc was reported above the ecological SAC.

The PSI has not identified contamination that would preclude the proposed development/use of the site. However, a Detailed (Stage 2) Site investigation (DSI) is required to facilitate development of a Remediation Action Plan (RAP) and remediation will be required to render the site suitable for the proposed development. We recommend the following:

1. Prepare a Sampling, Analysis and Quality Plan (SAQP) for the DSI;
2. Undertake a DSI in accordance with the SAQP; and
3. Develop and implement a RAP based on the combined findings of the PSI and DSI. Any requirements documented in a RAP are to be implemented and the site is to be remediated and validated.

At this stage, JKE consider that there is currently no requirement to report any site contamination to the NSW EPA under the NSW EPA Guidelines on the Duty to Report Contamination under Section 60 of the CLM Act 1997 (2015). This will be further evaluated as part of the DSI.

JKE consider that the report objectives outlined in Section 1.2 have been addressed.

The conclusions and recommendations should be read in conjunction with the limitations presented in the body of this report.

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Attachments

Abbreviations

Asbestos Fines/Fibrous Asbestos	**AF/FA**
Ambient Background Concentrations	**ABC**
Added Contaminant Limits	**ACL**
Asbestos Containing Material	**ACM**
Australian Drinking Water Guidelines	**ADWG**
Area of Environmental Concern	**AEC**
Australian Height Datum	**AHD**
Acid Sulfate Soil	**ASS**
Above-Ground Storage Tank	**AST**
Below Ground Level	**BGL**
Benzo(a)pyrene Toxicity Equivalent Factor	**BaP TEQ**
Bureau of Meteorology	**BOM**
Benzene, Toluene, Ethylbenzene, Xylene	**BTEX**
Before You Dig	**BYD**
Cation Exchange Capacity	**CEC**
Contaminated Land Management	**CLM**
Contaminant(s) of Potential Concern	**CoPC**
Chain of Custody	**COC**
Conceptual Site Model	**CSM**
Data Quality Indicator	**DQI**
Data Quality Objective	**DQO**
Detailed (Stage 2) Site Investigation	**DSI**
Ecological Investigation Level	**EIL**
Ecological Screening Level	**ESL**
Environment Protection Authority	**EPA**
Health Investigation Level	**HILs**
Health Screening Level	**HSL**
Health Screening Level-Site Specific Assessment	**HSL-SSA**
International Organisation of Standardisation	**ISO**
JK Environments	**JKE**
Lab Control Spike	**LCS**
Light Non-Aqueous Phase Liquid	**LNAPL**
Map Grid of Australia	**MGA**
National Association of Testing Authorities	**NATA**
National Environmental Protection Measure	**NEPM**
Organochlorine Pesticides	**OCP**
Organophosphate Pesticides	**OPP**
Polycyclic Aromatic Hydrocarbons	**PAH**
Polychlorinated Biphenyls	**PCBs**
Photo-ionisation Detector	**PID**
Protection of the Environment Operations	**POEO**
Practical Quantitation Limit	**PQL**
Quality Assurance	**QA**
Quality Control	**QC**
Remediation Action Plan	**RAP**
Relative Percentage Difference	**RPD**
Site Assessment Criteria	**SAC**
Sampling, Analysis and Quality Plan	**SAQP**
State Environmental Planning Policy	**SEPP**
Site Specific Assessment	**SSA**
Source, Pathway, Receptor	**SPR**
Specific Contamination Concentration	**SCC**
Standard Penetration Test	**SPT**

Standing Water Level	**SWL**
Trip Blank	**TB**
Toxicity Characteristic Leaching Procedure	**TCLP**
Total Recoverable Hydrocarbons	**TRH**
Trip Spike	**TS**
Upper Confidence Limit	**UCL**
United States Environmental Protection Agency	**USEPA**
Underground Storage Tank	**UST**
Virgin Excavated Natural Material	**VENM**
Volatile Organic Compounds	**VOC**
World Health Organisation	**WHO**
Work Health and Safety	**WHS**

Units

Litres	**L**
Metres BGL	**mBGL**
Metres	**m**
Millivolts	**mV**
Millilitres	**ml or mL**
Milliequivalents	**meq**
micro Siemens per Centimetre	**µS/cm**
Micrograms per Litre	**µg/L**
Milligrams per Kilogram	**mg/kg**
Milligrams per Litre	**mg/L**
Parts Per Million	**ppm**
Percentage	**%**
Percentage weight for weight	**%w/w**

1 INTRODUCTION

NSW Health Infrastructure ('the client') commissioned JK Environments (JKE) to undertake a Preliminary (Stage 1) Site Investigation (PSI) for the proposed MPS Stage 5 development at Blayney District Hospital, 3 Osman Street, Blayney, NSW ('the site'). The purpose of the investigation is to make a preliminary assessment of site contamination. The site location is shown on Figure 1 and the investigation was confined to the site boundaries as shown on Figure 2.

A geotechnical investigation was undertaken in conjunction with this PSI by JK Geotechnics (JKG). The results of the geotechnical investigation are presented in a separate report (Ref: 35521LFrpt). This report should be read in conjunction with the JKG report.

JKE has previously undertaken a PSI (desktop) at the site. A summary of this information has been included in Section 2.

1.1 Proposed Development Details

The proposed development is in the early planning stages and no proposed development plans/drawings have been provided. Based on the limited information provided, we understand that the proposed development would likely be constructed on grade, with minimal excavations for services trenches.

1.2 Aims and Objectives

The primary aims of the investigation were to identify any past or present potentially contaminating activities at the site, identify the potential for site contamination, and make a preliminary assessment of the soil and groundwater contamination conditions. The objectives were to:

- Identify potential contamination sources/areas of environmental concern (AEC) and contaminants of potential concern (CoPC);
- Assess the soil and groundwater contamination conditions via implementation of a preliminary sampling and analysis program;
- Review and update the conceptual site model (CSM);
- Assess the potential risks posed by contamination to the receptors identified in the CSM (Tier 1 assessment);
- Provide a preliminary waste classification for off-site disposal of soil;
- Assess whether the site is suitable or can be made suitable for the proposed development (from a contamination viewpoint); and
- Assess whether further intrusive investigation and/or remediation is required.

1.3 Scope of Work

The investigation was undertaken generally in accordance with a JK proposal (Ref: P57148LF) of 18 August 2022 and written acceptance from the client of 8 November 2022 (Ref: HI22330) The scope of work included the following:

- Review of desktop PSI and existing project information;
- Review and update the CSM;

- Design and implementation of a sampling, analysis and quality plan (SAQP);
- Interpretation of the analytical results against the adopted Site Assessment Criteria (SAC);
- Data Quality Assessment; and
- Preparation of a report including a Tier 1 risk assessment.

The scope of work was undertaken with reference to the National Environmental Protection (Assessment of Site Contamination) Measure 1999 as amended (2013)[1], other guidelines made under or with regards to the Contaminated Land Management Act (1997)[2] and SEPP Resilience and Hazards 2021. A list of reference documents/guidelines is included in the appendices.

[1] National Environment Protection Council (NEPC), (2013). *National Environmental Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013).* (referred to as NEPM 2013)

[2] Contaminated Land Management Act 1997 (NSW) (referred to as CLM Act 1997)

2 SITE INFORMATION

2.1 Desktop PSI, JKE 2022

JKE undertook a desktop PSI in November 2022[3]. The desktop PSI included a review of site information, including background and site history information from various sources, and a site walkover inspection. During the site inspection, a NSW Health representative (Brian Harvey) from the hospital indicated that a 500L diesel underground storage tank (UST) was located beneath the lawn between the maintenance building and the main carpark at the front of the hospital (refer to Figure 2). The UST was indicated to have been decommissioned circa 1999.

The NSW Ambulance Station located to the west of the site was also inspected during the site walkover. A representative from NSW Ambulance indicated that a diesel UST and associate bowser had previously been located on the premises and were remediated/removed circa 2010 (refer to Figure 2).

Based on the information reviewed and the site inspection, JKE identified the following potential contamination sources/AEC: fill material – unknown origin; fuel storage onsite – abandoned diesel UST and above-ground storage tank (AST); use of pesticides – around site and beneath buildings/structures; hazardous building materials – former and existing buildings and structures; naturally occurring asbestos – mapped within the regional geological formation; and off-site land uses (upgradient ambulance station with a former UST, and a motor mechanic).

Considering the findings and based on a qualitative assessment of various lines of evidence, JKE was of the opinion that there is a potential for site contamination. Based on the potential contamination sources/AEC identified, and the potential for contamination, further investigation of the contamination conditions was considered to be required. The following was recommended to better assess the risks associated with potential contamination at the site:

- A preliminary intrusive investigation should be undertaken as a first step to make an initial assessment of the soil and groundwater contamination conditions and better inform the scope of Detailed (Stage 2) Site Investigation (DSI);
- Following the preliminary intrusive investigation, a Sampling, Analysis and Quality Plan (SAQP) should be prepared for the DSI;
- A DSI should be undertaken to characterise the site contamination conditions and establish whether the site is suitable for the proposed development, or whether remediation is required; and
- A hazardous building materials survey should be undertaken prior to demolition of the buildings. Following demolition of the buildings (and preferably prior to removal of the hardstand), an asbestos clearance certificate should be obtained.

This report has been prepared to address the first recommendation of the desktop PSI.

2.2 Site Identification

Table 2-1: Site Identification

[3] JK Environments, (2022). *Report to Health Infrastructure on Desktop Preliminary (Stage 1) Site Investigation for Proposed MPS Stage 5 Development at 3 Osman Street, Blayney, NSW.* (Ref: E35521PTrpt, dated 30 November 2022) (referred to as desktop PSI)

Current Site Owner (certificate of title):	Health Administration Board
Site Address:	3 Osman Street, Blayney, NSW
Lot & Deposited Plan:	Lot 2 in DP1097082
Current Land Use:	Hospital
Proposed Land Use:	Continued use as a hospital
Local Government Authority (LGA):	Blayney Shire Council
Current Zoning:	R1: General Residential
Site Area (a) (approx.):	1.37Ha
RL (AHD in m) (approx.):	870-880
Geographical Location (decimal degrees) (approx. centre of site):	Latitude: -33.5378491 Longitude: 149.250869

2.3 Site Location and Regional Setting

The site is located in a predominantly residential area of Blayney and is bound by Martha Street to the south (the Mid Western Highway) and Osman Street to the east. The site is located approximately 445m to the south-west of a tributary of the Belubula River.

2.4 Topography

The regional topography is characterised by a north-east facing hillside that falls towards the Belubula River. The site is located mid-slope and has a gentle fall towards the north-east at approximately 1°-3°. Parts of the site appear to have been levelled to account for the slope and accommodate the existing development.

2.5 Site Inspection

A walkover inspection of the site was undertaken by JKE on 24 October 2022. The site observations were generally similar to those recorded during the inspection undertaken as part of the desktop PSI, with key observations summarised below:

- The site was occupied by Blayney District Hospital. The main hospital building was positioned in the centre of the site, car parks were located to the east (patient/general public) and to the west (staff) of the main building, and an access road ran along the south of the site;
- The main hospital building was separated into five adjoining buildings comprising the emergency department, hospital wards, offices and clinical, day-care centre, and the maintenance building. A separate aged care home was located to the north, and several carports (including a flammable liquids store) were located to the west. All buildings and structures were single storey, and of an age indicative of potentially housing hazardous building materials (i.e. asbestos and lead paint);

- The car parks and access road/driveway were all asphaltic concrete paved and numerous concrete paved pathways were located around the buildings;
- No evidence of erosion/soil instability was observed during the site inspection;
- A disused diesel 500L AST was observed in the maintenance building adjacent to the former back-up generator (refer to figure 2). A small amount of staining was observed on the surrounding concrete slab ground surface during the inspection;
- A small quantity of petrol fuel (approximately 5-10L) was observed to be stored in the rear carport flammable liquids store. This fuel was indicated to be used for the onsite mower. No odours or staining were observed on the surrounding ground surfaces during the inspection and this type of fuel storage was not considered to be a potential source of contamination considering the very small quantities involved;
- General waste storage (locked skip bins) identified at rear of the main hospital building (west). No other drums, chemical or waste storage was observed on the site during the inspection;
- Fill material (igneous gravels, brick and concrete fragments, etc.) were observed at the site surface in unpaved areas and generally along the southern batter and beneath the newer emergency department building, indicating that some filling had likely occurred at the site for the current development and levelling purposes;
- A grease trap was observed at the rear of the main hospital building (refer to figure 2);
- Surface water flows would be expected to flow to the north-east in keeping with the localised fall of the site. It is noted that several surface drains were observed in the paved sections of the site and these would be expected to drain into the regional stormwater systems; and
- Outside of paved or gravel covered areas the site was generally grass covered, with a number of medium to large trees along the southern, eastern and northern boundaries and within garden areas. No obvious signs of plant stress or dieback were observed.

2.6 Surrounding Land Use

During the site inspection, JKE observed the following land uses in the immediate surrounds:

- North – Residential properties including a hostel;
- South – Martha Street and residential properties beyond;
- East – Osman Street and residential properties beyond; and
- West – NSW Ambulance station including a former diesel UST, residential and commercial properties (including a mechanic - Blayney Pit Stop Autos).

JKE is of the opinion that the adjacent and upgradient NSW Ambulance Station to the west of the site is a potential off-site contamination source due to the (former) presence of at least one UST. The upgradient mechanic may also be an off-site source of contamination.

2.7 Underground Services

The 'Before You Dig' (BYD) plans were reviewed for the investigation in order to establish whether any major underground services exist at the site or in the immediate vicinity that could act as a preferential pathway

for contamination migration. Major services were not identified that would be expected to act as preferential pathways for contamination migration.

2.8 Summary of Site History Information

A time line summary of the historical land uses and activities is presented in the table below. The information presented in the table is based on a weight of evidence assessment of the site history documentation and observations made by JKE during the desktop PSI.

Table 2-2: Summary of Historical Land Uses/Activities

Year(s)	Potential Land Use/Activities
1886-1974	On-site: • Land dedicated for hospital use; • Development of the site for the original hospital; • Some filling of the site likely occurred for levelling purposes and around services; • Use of pesticides beneath buildings and around site; and • Hazardous building materials (i.e. asbestos and lead in paint) may have been used in original structures. Surrounding Area: • Vacant and residential land uses.
1974-2003	On-site: • Ongoing redevelopment of the site including construction of existing buildings, pathways and vehicle access (driveways and car parks); • Some filling of the site likely occurred for levelling purposes and around services; • Use of pesticides beneath buildings and around site; • Hazardous building materials (i.e. asbestos and lead in paint) may have been used in existing structures; • Installation and abandonment of diesel UST (circa 1999); • Installation and abandonment of diesel AST (circa 1999); and • Installation and use of grease trap (ongoing). Surrounding Area: • Ongoing residential development; and • Adjacent NSW Ambulance premises, remediation/removal of diesel UST and bowser (circa 2010).

3 GEOLOGY AND HYDROGEOLOGY

3.1 Regional Geology and Soil Landscapes

Regional geological information reviewed for the desktop PSI indicated that the site is underlain by Wombiana Formation Shale, which typically consists of buff to light coloured shales, siltstone, limestones and fine-grained sandstones and marble.

It is also noted that the Blayney Volcanics are located approximately 305m to the south-west which have a medium potential for naturally occurring asbestos.

The Soil Landscape information indicated that the site is located within the Vittoria-Blayney soil landscape. Vittoria-Blayney soils are characterised by moderate erodibility with some higher local occurrences and low salinity.

3.2 Acid Sulfate Soil (ASS) Risk and Planning

ASS information reviewed for the desktop PSI indicated that the site is not located in an ASS risk area.

3.3 Hydrogeology

Hydrogeological information reviewed for the desktop PSI indicated that the regional aquifer on-site and in the areas immediately surrounding the site includes fractured or fissured, extensive aquifers of low to moderate productivity. There was a total of 29 registered bores within the report buffer of 2,000m. In summary:

- The nearest registered bore was located approximately 215m south of the site. This was utilised for stock and domestic purposes;
- The majority of the bores were registered for water supply purposes;
- There closest down gradient bore was approximately 380m to the north-east of the site and was registered for water supply use; and
- The drillers log information from the closest registered bores typically identified fill and/or clay soil to depths of 8m-66m, underlain by shale or granite bedrock. Standing water levels (SWLs) in the bores ranged from 1m below ground level (BGL) to 30mBGL.

The information reviewed for the desktop PSI indicated that the subsurface conditions at the site are likely to consist of relatively low permeability (residual) soils overlying shallow bedrock. Use of groundwater is not proposed as part of the development. However, groundwater appears to be utilised as a resource in the surrounds (i.e. stock/irrigation) based on the registered groundwater bores. A cursory internet search did not suggest that the town water supply is sourced from groundwater.

Considering the local topography and surrounding land features, JKE anticipate groundwater to flow towards the north-east.

3.4 Water Bodies

Surface water bodies were not identified in the immediate vicinity of the site. The closest surface water body is a tributary of the Belubula River located approximately 440m to the north-east of the site. This is down-gradient from site and is considered to be a potential receptor. The Belubula River proper is located approximately 795m to the north-east of the site at its closest point.

4 CONCEPTUAL SITE MODEL

4.1 Potential Contamination Sources/AEC and CoPC

The potential contamination sources/AEC and CoPC are presented in the following table:

Table 4-1: Potential (and/or known) Contamination Sources/AEC and Contaminants of Potential Concern

Source / AEC	CoPC
Fill material – The site appears to have been historically filled to achieve the existing levels. The fill may have been imported from various sources and could be contaminated. During the inspection evidence of fill (igneous gravel, brick and concrete fragments) were observed at the site surface.	Heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), petroleum hydrocarbons (referred to as total recoverable hydrocarbons – TRHs), benzene, toluene, ethylbenzene and xylene (BTEX), polycyclic aromatic hydrocarbons (PAHs), organochlorine pesticides (OCPs), organophosphate pesticides (OPPs), polychlorinated biphenyls (PCBs) and asbestos.
Fuel storage – At least one UST and one AST were identified at the site (see Figure 2). The NSW Health Representative indicated that both tanks had been used to store diesel, however were now redundant.	Heavy metals, TRH, BTEX and PAHs
Use of pesticides – Pesticides may have been used beneath the buildings and/or around the site.	Heavy metals and OCPs
Hazardous Building Material – Hazardous building materials may be present as a result of former building and demolition activities. These materials may also be present in the existing buildings/ structures on site.	Asbestos, lead and PCBs
Naturally Occurring Asbestos – A medium risk of naturally occurring asbestos is mapped within 305m of the site.	Asbestos (natural soils/bedrock)
Off-site Fuel Storage & Motor Mechanic– A diesel UST was indicated to have formerly been present on the adjacent and upgradient ambulance station. Personnel on the ambulance site indicated that the UST and bowser were remediated/removed circa 2010. A motor mechanics is located upgradient of the site.	Heavy metals, TRH, BTEX, volatile organic compounds (VOCs) possibly including chlorinated solvents, and PAHs

4.2 Mechanism for Contamination, Affected Media, Receptors and Exposure Pathways

The mechanisms for contamination, affected media, receptors and exposure pathways relevant to the potential contamination sources/AEC are outlined in the following CSM table:

Table 4-2: CSM

Potential mechanism for contamination	Potential mechanisms for contamination include: • Fill material – importation of impacted material, 'top-down' impacts (e.g. placement of fill, leaching from surficial material etc), or sub-surface release (e.g. impacts from buried material);

	• Fuel storage – 'top-down', spills (e.g. during filling of the tanks and/or dispensing activities), or sub-surface release (e.g. from leaking tank or pipework); • Use of pesticides – 'top-down' and spills (e.g. during normal use, application and/or improper storage); • Hazardous building materials – 'top-down' (e.g. demolition resulting in surficial impacts in unpaved areas); • Naturally occurring asbestos – subsurface impacts in the natural soil and bedrock; and • Off-site land uses – 'top-down', spill or sub-surface release. Impacts to the site could occur via migration of contaminated groundwater.
Affected media	Soil and groundwater have been identified as potentially affected media. Soil vapour may need to be considered specifically, however, potential vapour impacts can initially be evaluated via the soil and groundwater media.
Receptor identification	Human receptors include site occupants/users (including adults and children), construction workers and intrusive maintenance workers. Off-site human receptors include adjacent land users and groundwater users. Ecological receptors include terrestrial organisms and plants within unpaved areas (including any proposed landscaped areas), and freshwater ecology in the tributary of the Belubula River.
Potential exposure pathways	Potential exposure pathways relevant to the human receptors include ingestion, dermal absorption and inhalation of dust (all contaminants) and vapours (volatile TRH, naphthalene and BTEX), together with incidental contact with groundwater. The potential for exposure would typically be associated with the construction and excavation works, future use of the site, and off-site groundwater use. Potential exposure pathways for ecological receptors include primary contact and ingestion. Exposure during future site use could occur via direct contact with soil in unpaved areas such as gardens, inhalation of airborne asbestos fibres during soil disturbance, or inhalation of vapours within enclosed spaces such as buildings. Exposure to groundwater could occur in the tributary of the Belubula River through direct migration if there is groundwater to surface water connectivity. Exposure to groundwater could also occur as a result of groundwater abstraction from groundwater bores and use of groundwater for irrigation/stock watering.
Potential exposure mechanisms	The following have been identified as potential exposure mechanisms for site contamination: • Vapour intrusion into the proposed buildings (either from soil contamination or volatilisation of contaminants from groundwater); • Contact (dermal, ingestion or inhalation) with exposed soils in landscaped areas and/or unpaved areas; • Migration of groundwater off-site and into nearby water bodies, including aquatic ecosystems; and • Migration of groundwater off-site into areas where groundwater is being utilised as a resource (i.e. for stock, irrigation and domestic uses).

Presence of preferential pathways for contaminant movement	Preferential pathways for contaminant migration could be associated with backfill around services. Preferential pathways will require further assessment as the proposed development details are formalised.

5 SAMPLING, ANALYSIS AND QUALITY PLAN

5.1 Data Quality Objectives (DQO)

Data Quality Objectives (DQOs) were developed to define the type and quality of data required to achieve the project objectives outlined in Section 1.2. The DQOs were prepared with reference to the process outlined in Schedule B2 of NEPM (2013). The seven-step DQO approach for this project is outlined in the following sub-sections.

The DQO process is validated in part by the Data Quality Assurance/Quality Control (QA/QC) Evaluation. The Data (QA/QC) Evaluation is summarised in Section 7.1 and the detailed evaluation is provided in the appendices.

5.1.1 Step 1 - State the Problem

The CSM identified potential sources of contamination/AEC at the site that may pose a risk to human health and the environment. Investigation data is required to assess the contamination status of the site, assess the risks posed by the contaminants in the context of the proposed development/intended land use, and assess whether remediation is required. This information will be considered by the consent authority in exercising its planning functions in relation to the development proposal.

A waste classification is required prior to off-site disposal of excavated soil/bedrock.

The investigation was constrained by the scope requested by the client and, in-part, by access limitations associated with the existing structures on site.

5.1.2 Step 2 - Identify the Decisions of the Study

The objectives of the investigation are outlined in Section 1.2. The decisions to be made reflect these objectives and are as follows:

- Are any results above the SAC?
- Do potential risks associated with contamination exist, and if so, what are they?
- Is further investigation/remediation required?
- Is the site characterisation sufficient to provide adequate confidence in the above decisions?
- Is the site suitable for the proposed development, or can the site be made suitable subject to further characterisation and/or remediation?

5.1.3 Step 3 - Identify Information Inputs

The primary information inputs required to address the decisions outlined in Step 2 include the following:

- Existing relevant environmental data from previous reports;
- Site information, including site observations and site history documentation;
- Sampling of potentially affected media, including soil and groundwater;
- Observations of sub-surface variables such as soil type, photo-ionisation detector (PID) concentrations, odours and staining, and groundwater physiochemical parameters;
- Laboratory analysis of soils and groundwater for the CoPC identified in the CSM; and

- Field and laboratory QA/QC data.

5.1.4 Step 4 - Define the Study Boundary

The sampling will be confined to the site boundaries as shown in Figure 2 and will be limited vertically to a depth of 6.45mBGL (spatial boundary). The sampling was completed between 24 and 28 October 2022 (temporal boundary). The assessment of potential risk to adjacent land users has been made based on data collected within the site boundary.

Sampling was not undertaken within the existing building footprint due to access constraints.

5.1.5 Step 5 - Develop an Analytical Approach (or Decision Rule)

5.1.5.1 Tier 1 Screening Criteria

The laboratory data will be assessed against relevant Tier 1 screening criteria (referred to as SAC), as outlined in Section 6. Exceedances of the SAC do not necessarily indicate a requirement for remediation or a risk to human health and/or the environment. Exceedances are considered in the context of the CSM and valid SPR-linkages.

For this investigation, the individual results have been assessed as either above or below the SAC. Statistical evaluation of the dataset via calculation of mean values and/or 95% upper confidence limit (UCL) values has not been undertaken due to the spatial distribution of the data and the number of samples submitted for analysis.

5.1.5.2 Field and Laboratory QA/QC

Field QA/QC included analysis of inter-laboratory duplicates, intra-laboratory duplicates, trip spike, trip blank and rinsate samples. Further details regarding the sampling and analysis undertaken, and the acceptable limits adopted, is provided in the Data Quality (QA/QC) Evaluation in the appendices.

The suitability of the laboratory data is assessed against the laboratory QA/QC criteria which is outlined in the attached laboratory reports. These criteria were developed and implemented in accordance with the laboratory's National Association of Testing Authorities, Australia (NATA) accreditation and align with the acceptable limits for QA/QC samples as outlined in NEPM (2013) and other relevant guidelines.

In the event that acceptable limits are not met by the laboratory analysis, other lines of evidence are reviewed (e.g. field observations of samples, preservation, handling etc) and, where required, consultation with the laboratory is undertaken in an effort to establish the cause of the non-conformance. Where uncertainty exists, JKE typically adopt the most conservative concentration reported (or in some cases, consider the data from the affected sample as an estimate).

5.1.5.3 Appropriateness of Practical Quantitation Limits (PQLs)

The PQLs of the analytical methods are considered in relation to the SAC to confirm that the PQLs are less than the SAC. In cases where the PQLs are greater than the SAC, a discussion of this is provided.

5.1.6 Step 6 – Specify Limits on Decision Errors

To limit the potential for decision errors, a range of quality assurance processes are adopted. A quantitative assessment of the potential for false positives and false negatives in the analytical results is undertaken with reference to Schedule B(3) of NEPM (2013) using the data quality assurance information collected.

Decision errors can be controlled through the use of hypothesis testing. The test can be used to show either that the baseline condition is false or that there is insufficient evidence to indicate that the baseline condition is false. The null hypothesis is an assumption that is assumed to be true in the absence of contrary evidence. For this investigation, the null hypothesis has been adopted which is that, there is considered to be a complete SPR linkage for the CoPC identified in the CSM unless this linkage can be proven not to (or unlikely to) exist. The null hypothesis has been adopted for this investigation.

Quantitative limits on decision errors were not established as the sample plan was not probabilistic. OR

Data Quality Indicators (DQI) for field and laboratory QA/QC samples are defined in the QA/QC Data Evaluation in the appendices. An assessment of the DQI's was made in relation to precision, accuracy, representativeness, completeness and comparability.

5.1.7 Step 7 - Optimise the Design for Obtaining Data

The most resource-effective design will be used in an optimum manner to achieve the investigation objectives. Adjustment of the investigation design can occur following consultation or feedback from project stakeholders. For this investigation, the design was optimised via consideration of the various lines of evidence used to select the sample locations, the media being sampled, and also by the way in which the data were collected concurrently with the JKG investigation.

The sampling plan and methodology are outlined in the following sub-sections.

5.2 Soil Sampling Plan and Methodology

The soil sampling plan and methodology adopted for this investigation is outlined in the table below:

Table 5-1: Soil Sampling Plan and Methodology

Aspect	Input
Sampling Density	Samples were collected from 11 locations (BH1, BH3, BH5, BH6, BH10, BH12, BH13, BH14, BH15, BH17 and BH20) as shown on the attached Figure 3. Based on the site area (1.37Ha), this number of locations corresponded to a sampling density of approximately one sample per 1,245m^2. The sampling plan was not designed to meet the minimum sampling density for hotspot identification, as outlined in the NSW EPA Sampling Design Part 1 – Application (2022)[4] contaminated land guidelines.
Sampling Plan	The sampling locations were placed on a judgemental sampling plan and were broadly positioned for site coverage, taking into consideration areas that were not easily accessible. This sampling

[4] NSW EPA, (2022). *Sampling design part 1 - application.* (referred to as EPA Sampling Design Guidelines 2022)

Aspect	Input
	plan was considered suitable to make a preliminary assessment of potential risks associated with the AEC and CoPC identified in the CSM, and assess whether further investigation is warranted. BH/MW12 was marginally outside (i.e. to the west of) the site boundary.
Set-out and Sampling Equipment	Sampling locations were set out using a hand held GPS unit (with an accuracy of ±0.2m). In-situ sampling locations were checked for underground services by an external contractor prior to sampling. Soil samples from BH3, BH5, BH6, and BH10 were collected using a hand auger. Soil samples from BH1, BH12, BH14, BH15, BH17 and BH20 were collected using a drill rig equipped with spiral flight augers (150mm diameter). Soil samples were obtained from a Standard Penetration Test (SPT) split-spoon sampler, and/or directly from the auger.
Sample Collection and Field QA/QC	Soil samples were obtained between 24 and 28 October 2022 in accordance with our standard field procedures. Soil samples were collected from the fill and natural profiles based on field observations. The sample depths are shown on the logs attached in the appendices. Samples were placed in glass jars with plastic caps and teflon seals with minimal headspace. Samples for asbestos analysis were placed in zip-lock plastic bags. During sampling, soil at selected depths was split into primary and duplicate samples for field QA/QC analysis. The field splitting procedure included alternately filling the sampling containers to obtain a representative split sample.
Field Screening	A portable Photoionisation Detector (PID) fitted with a 10.6mV lamp was used to screen the samples for the presence of volatile organic compounds (VOCs). PID screening for VOCs was undertaken on soil samples using the soil sample headspace method. VOC data was obtained from partly filled zip-lock plastic bags following equilibration of the headspace gases. PID calibration records are maintained on file by JKE. The field screening for asbestos quantification included the following: • A representative bulk sample was collected from fill at 1m intervals, or from each distinct fill profile. The quantity of material for each sample varied based on whatever return could be achieved using the auger. The bulk sample intervals are shown on the attached borehole logs; • Each sample was weighed using an electronic scale; • Each bulk sample was passed through a sieve with a 7.1mm aperture and inspected for the presence of fibre cement; • The condition of fibre cement or any other suspected asbestos materials was noted on the field records; and • If observed, any fragments of fibre cement in the bulk sample were collected, placed in a zip-lock bag and assigned a unique identifier. Calculations for asbestos content were undertaken based on the requirements outlined in Schedule B1 of NEPM (2013), as summarised in Section 6.1. A calibration/check of the accuracy of the scale used for weighing the fibre cement fragments was undertaken using a set of calibration weights. Calibration/check records are maintained on file by JKE. The scale used to weigh the 10L samples was not calibrated, however this is not considered

Aspect	Input
	significant as this method of providing a weight for the bulk sample is considered to be considerably more accurate than applying a nominal soil density conversion.
Decontami-nation and Sample Preservation	Sampling personnel used disposable nitrile gloves during sampling activities. Re-usable sampling equipment was decontaminated using Decon and potable water. Soil samples were preserved by immediate storage in an insulated sample container with ice. On completion of the fieldwork, the samples were stored temporarily in fridges in the JKE warehouse before being delivered in the insulated sample container to a NATA registered laboratory for analysis under standard chain of custody (COC) procedures.

5.3 Groundwater Sampling Plan and Methodology

The groundwater sampling plan and methodology is outlined in the table below:

Table 5-2: Groundwater Sampling Plan and Methodology

Aspect	Input
Sampling Plan	Groundwater monitoring wells were installed in BH1 (MW1), BH12 (MW12) and BH15 (MW15). The wells were positioned to gain a snap-shot of the groundwater conditions. Considering the topography and the location of the nearest down-gradient water body, MW12 and MW15 were considered to be in the up-gradient area of the site and would be expected to provide an indication of groundwater flowing onto (beneath) the site from the south-west. MW1 was considered to be in the intermediate to down-gradient area of the site and would be expected to provide an indication of groundwater flowing across (beneath) the site and beyond the down-gradient site boundary.
Monitoring Well Installation Procedure	The monitoring well construction details are documented on the appropriate borehole logs attached in the appendices. The monitoring wells were installed to depths of approximately 6m below ground level. The wells were generally constructed as follows: • 50mm diameter Class 18 PVC (machine slotted screen) was installed in the lower section of the well to intersect groundwater; • 50mm diameter Class 18 PVC casing was installed in the upper section of the well (screw fixed); • A 2mm sand filter pack was used around the screen section for groundwater infiltration; • A hydrated bentonite seal/plug was used on top of the sand pack to seal the well; and • A gatic cover was installed at the surface with a concrete plug to limit the inflow of surface water.
Monitoring Well Development	The monitoring wells were developed on 26 October 2022 using a submersible electrical pump. Due to the hydrogeological conditions, groundwater inflow into the wells was relatively low, therefore the wells were pumped until they were effectively dry. Steady state conditions were not achieved. The field monitoring records and calibration data are attached in the appendices.
Groundwater Sampling	The monitoring wells were allowed to recharge for approximately two days after development. Groundwater samples were obtained on 28 October 2022. Prior to sampling, the monitoring wells were checked for the presence of Light Non-Aqueous Phase Liquids (LNAPLs) using an inter-phase probe electronic dip meter. The monitoring well head space was checked for VOCs using a calibrated PID unit. The samples were obtained using a

Aspect	Input
	peristaltic pump/disposable plastic bailer. During sampling, the following parameters were monitored using calibrated field instruments: • Standing water level (SWL) using an electronic dip meter; and • pH, temperature, electrical conductivity (EC), dissolved oxygen (DO) and redox potential (Eh) using a YSI Multi-probe water quality meter. Steady state conditions were considered to have been achieved when the difference in the pH measurements was less than 0.2 units, the difference in conductivity was less than 10%, and when the SWL was not in drawdown. Groundwater samples were obtained directly from the single use PVC tubing and placed in the sample containers. Duplicate samples were obtained by alternate filling of sample containers. This technique was adopted to minimise disturbance of the samples and loss of volatile contaminants associated with mixing of liquids in secondary containers, etc. Groundwater removed from the wells during development and sampling was transported to JKE in jerry cans and stored in holding drums prior to collection by a licensed waste water contractor for off-site disposal. The field monitoring record and calibration data are attached in the appendices.
Decontaminant and Sample Preservation	During development, the pump was flushed between monitoring wells with potable water (single-use tubing was used for each well). The pump tubing was discarded after each sampling event and replaced therefore no decontamination procedure was considered necessary. The samples were preserved with reference to the analytical requirements and placed in an insulated container with ice or ice bricks. On completion of the fieldwork, the samples were temporarily stored in a fridge at the JKE office, before being delivered in the insulated sample container to a NATA registered laboratory for analysis under standard COC procedures.

5.3.1 Laboratory Analysis

Samples were analysed by an appropriate, NATA Accredited laboratory using the analytical methods detailed in Schedule B(3) of NEPM 2013. Reference should be made to the laboratory reports attached in the appendices for further details.

Table 5-3: Laboratory Details

Samples	Laboratory	Report Reference
All primary samples and field QA/QC samples including (intra-laboratory duplicates, trip blanks, trip spikes and field rinsate samples)	Envirolab Services Pty Ltd NSW, NATA Accreditation Number – 2901 (ISO/IEC 17025 compliance)	309378, 309378-A, 309378-B, 309378-C and 309386.
Inter-laboratory duplicates	Envirolab Services Pty Ltd VIC, NATA Accreditation Number – 2901 (ISO/IEC 17025 compliance)	34326 and 34328

6 SITE ASSESSMENT CRITERIA (SAC)

The SAC were derived from the NEPM 2013 and other guidelines as discussed in the following sub-sections. The guideline values for individual contaminants are presented in the attached report tables and further explanation of the various criteria adopted is provided in the appendices.

6.1 Soil

Soil data were compared to relevant Tier 1 screening criteria in accordance with NEPM (2013) as outlined below.

6.1.1 Human Health

- Health Investigation Levels (HILs) for a 'residential with accessible soils, including childcare' land use exposure scenario (HIL-A). These criteria have been adopted to make a preliminary assessment of risks to the most sensitive receptors (i.e. children). In our opinion, the other generic land-use types in NEPM (2013) are less appropriate for a hospital land use scenario where there are relatively large unpaved/grassed/landscape areas;
- Health Screening Levels (HSLs) for a 'low-high density residential' exposure scenario (HSL-A & HSL-B). HSLs were calculated based on conservative assumptions including a 'sand' type and a depth interval of 0m to 1m;
- HSLs for direct contact presented in the CRC Care Technical Report No. 10 – Health screening levels for hydrocarbons in soil and groundwater Part 1: Technical development document (2011)[5]; and
- Asbestos was assessed on the basis of presence/absence and against the HSL-A criteria. A summary of the asbestos criteria is provided in the table below:

Table 6-1: Details for Asbestos SAC

Guideline	Applicability
Asbestos in Soil	The HSL-A criteria were adopted for the assessment of asbestos in soil. The SAC adopted for asbestos were derived from the NEPM 2013 and are based on the Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2021)[6]. The SAC include the following: • No visible asbestos at the surface/in the top 10cm of soil; • <0.01% w/w bonded asbestos containing material (ACM) in soil; and • <0.001% w/w asbestos fines/fibrous asbestos (AF/FA) in soil. Concentrations for bonded ACM concentrations in soil are based on the following equation which is presented in Schedule B1 of NEPM (2013): $$\textbf{\% w/w asbestos in soil} = \frac{\textbf{\% asbestos content x bonded ACM (kg)}}{\text{Soil volume (L) x soil density (kg/L)}}$$ However, we are of the opinion that the actual soil volume in a 10L bucket varies considerably due to the presence of voids, particularly when assessing cohesive soils. Therefore, each bucket sample was weighed using electronic scales and the above equation was adjusted as follows (we note that the units have also converted to grams):

[5] Cooperative Research Centre for Contamination Assessment and Remediation of the Environment (CRC Care), (2011). Technical Report No. 10 - *Health screening levels for hydrocarbons in soil and groundwater Part 1: Technical development document*

[6] Western Australian (WA) Department of Health (DoH), (2021). *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*. (referred to as WA DoH 2021)

Guideline	Applicability
	% w/w asbestos in soil = $\frac{\text{**% asbestos content x bonded ACM (g)**}}{\text{Soil weight (g)}}$

6.1.2 Environment (Ecological – terrestrial ecosystems)

- Ecological Investigation Levels (EILs) and Ecological Screening Levels (ESLs) for an 'urban residential and public open space' (URPOS) exposure scenario. These have only been applied to the top 2m of soil as outlined in NEPM (2013). The criterion for benzo(a)pyrene has been increased from the value presented in NEPM (2013) based on the Canadian Soil Quality Guidelines[7];
- ESLs were adopted based on the soil type; and
- EILs for selected metals were generally calculated based on the most conservative added contaminant limit (ACL) values presented in Schedule B(1) of NEPM (2013) and published ambient background concentration (ABC) values presented in the document titled Trace Element Concentrations in Soils from Rural and Urban Areas of Australia (1995)[8]; and
- In several samples, EILs for selected metals were calculated using site-specific soil parameters for pH, cation exchange capacity and clay content in fill. These data have been tabulated below for reference and were used to select the ACL values presented in Schedule B(1) of NEPM (2013) to sum with the published ambient background concentration (ABC) presented in the document titled Trace Element Concentrations in Soils from Rural and Urban Areas of Australia (1995)[9]. This method is considered to be adequate for the Tier 1 screening.

Table 6-2: Site Specific Soil Parameters

Location	Depth	Material type	pH	CEC	Clay content
BH1	0.5-0.8	Fill: gravelly clayey sand	NA	28	8
BH5	0-0.1	Fill: silt	6.65	12.5	NA
BH20	0.5-0.7	Fill: gravelly sand	NA	32	7

6.1.3 Management Limits for Petroleum Hydrocarbons

Management limits for petroleum hydrocarbons (as presented in Schedule B1 of NEPM 2013) were considered.

6.1.4 Waste Classification

Data for the waste classification assessment were assessed in accordance with the Waste Classification Guidelines, Part 1: Classifying Waste (2014)[10] as outlined in the following table:

[7] Canadian Council of Ministers of the Environment, (1999). *Canadian soil quality guidelines for the protection of environmental and human health: Benzo(a)Pyrene (1997)* (referred to as the Canadian Soil Quality Guidelines)

[8] Olszowy, H., Torr, P., and Imray, P., (1995), *Trace Element Concentrations in Soils from Rural and Urban Areas of Australia. Contaminated Sites Monograph Series No. 4*. Department of Human Services and Health, Environment Protection Agency, and South Australian Health Commission

[9] Olszowy, H., Torr, P., and Imray, P., (1995), *Trace Element Concentrations in Soils from Rural and Urban Areas of Australia. Contaminated Sites Monograph Series No. 4*. Department of Human Services and Health, Environment Protection Agency, and South Australian Health Commission.

[10] NSW EPA, (2014). *Waste Classification Guidelines, Part 1: Classifying Waste.* (referred to as Waste Classification Guidelines 2014)

Table 6-3: Waste Categories

Category	Description
General Solid Waste (non-putrescible)	• If Specific Contaminant Concentration (SCC) ≤ Contaminant Threshold (CT1) then Toxicity Characteristics Leaching Procedure (TCLP) not needed to classify the soil as general solid waste; and • If TCLP ≤ TCLP1 and SCC ≤ SCC1 then treat as general solid waste.
Restricted Solid Waste (non-putrescible)	• If SCC ≤ CT2 then TCLP not needed to classify the soil as restricted solid waste; and • If TCLP ≤ TCLP2 and SCC ≤ SCC2 then treat as restricted solid waste.
Hazardous Waste	• If SCC > CT2 then TCLP not needed to classify the soil as hazardous waste; and • If TCLP > TCLP2 and/or SCC > SCC2 then treat as hazardous waste.
Virgin Excavated Natural Material (VENM)	Natural material (such as clay, gravel, sand, soil or rock fines) that meet the following: • That has been excavated or quarried from areas that are not contaminated with manufactured chemicals, or with process residues, as a result of industrial, commercial mining or agricultural activities; • That does not contain sulfidic ores or other waste; and • Includes excavated natural material that meets such criteria for virgin excavated natural material as may be approved from time to time by a notice published in the NSW Government Gazette.

6.2 Groundwater

Groundwater data were compared to relevant Tier 1 screening criteria in accordance with NEPM (2013), following an assessment of environmental values in accordance with the Guidelines for the Assessment and Management of Groundwater Contamination (2007)[11]. Environmental values for this investigation include aquatic ecosystems, human uses, and human-health risks in non-use scenarios.

6.2.1 Human Health

- The NEPM (2013) HSLs were not applicable for one of the well locations (MW15) as the groundwater was recorded at depths shallower than 2m. This means that the standard assumptions used in deriving the NEPM (2013) HSLs are not applicable at MW15. As a conservative approach, a combination of both the NEPM (2013) HSLs and a site-specific assessment (SSA) for the Tier 1 screening of human health risks posed by volatile contaminants in groundwater has been undertaken. The HSLs for a 'low-high density residential' exposure scenario (HSL-A/HSL-B) were adopted. HSLs were calculated based on the soil type and the observed depth to groundwater;
- For the SSA, the assessment included selection of alternative Tier 1 criteria that were considered suitably protective of human health. These criteria are based on drinking water guidelines and have been referred to as HSL-SSA. The criteria were based on the following (as shown in the attached report tables):
    - Australian Drinking Water Guidelines 2011 (updated 2021)[12] for BTEX compounds and selected VOCs;

[11] NSW Department of Environment and Conservation, (2007). *Guidelines for the Assessment and Management of Groundwater Contamination.*

[12] National Health and Medical Research Council (NHMRC), (2021). *National Water Quality Management Strategy, Australian Drinking Water Guidelines 2011* (referred to as ADWG 2011)

- World Health Organisation (WHO) document titled Petroleum Products in Drinking-water, Background document for the development of WHO Guidelines for Drinking Water Quality (2008)[13] for petroleum hydrocarbons;
- USEPA Region 9 screening levels for naphthalene (threshold value for tap water); and
- The use of the laboratory PQLs for other contaminants where there were no Australian guidelines; and

- The ADWG 2014 were multiplied by a factor of 10 to assess potential risks associated with incidental/recreational-type exposure to groundwater (e.g. within down-gradient water bodies and with bore water used for irrigation). These have been deemed as 'recreational' SAC; and
- ADWG 2011 criteria were adopted as screening criteria for consumption of groundwater.

6.2.2 Environment (Ecological - aquatic ecosystems)

Groundwater Investigation Levels (GILs) for 95% protection of freshwater species were adopted based on the Default Guideline Values in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2018)[14]. The 99% trigger values were adopted where required to account for bioaccumulation. Low and moderate reliability trigger values were also adopted for some contaminants where high-reliability trigger values don't exist.

[13] World Health Organisation (WHO), (2008). *Petroleum Products in Drinking-water, Background document for the development of WHO Guidelines for Drinking Water Quality* (referred to as WHO 2008)

[14] Australian and New Zealand Governments (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 (referred to as ANZG 2018)

7 RESULTS

7.1 Summary of Data (QA/QC) Evaluation

The data evaluation is presented in the appendices. In summary, JKE is of the opinion that the data are adequately precise, accurate, representative, comparable and complete to serve as a basis for interpretation to achieve the investigation objectives.

7.2 Subsurface Conditions

A summary of the subsurface conditions encountered during the investigation is presented in the following table. Reference should be made to the borehole logs attached in the appendices for further details. We note that all borehole logs from the geotechnical investigation are included for information purposes (and the locations are shown on the relevant figures attached in the appendices), however, the summary below only relates to the conditions at the locations where environmental samples were collected for the PSI.

Table 7-1: Summary of Subsurface Conditions

Profile	Description
Pavement	Asphaltic Concrete (AC) pavement was encountered at the surface in BH1, BH13, BH17 and BH20 and was 50mm in thickness.
Fill	Fill was encountered at the surface or beneath the pavement in all boreholes and extended to depths of approximately 0.3mBGL to 1.2mBGL. BH10 was terminated in the fill at a maximum depth of approximately 0.6mBGL. The fill typically comprised clayey sand, gravelly clayey sand, silty clay with inclusions of brick and tile fragments, igneous, ironstone and sandstone gravel, clay nodules, slag, ash, coal and root fibres. No odours or staining were recorded in the fill material during field work. No fibre cement fragments (FCF)/ACM was encountered in the fill material during fieldwork.
Natural Soil	With the exception of BH10, natural residual silty clay or clayey silt soil was encountered beneath the fill material in all boreholes and extended to the maximum termination depth of the investigation at 6.45mBGL. No odours or staining were recorded in the natural soils during field work.
Groundwater	Groundwater seepage was encountered in BH3, BH5, BH6, BH17 and BH20 during drilling between 1.4mBGL and 6mBGL. SWLs measured in BH1, BH12, BH14, BH15 and BH20 on completion of drilling or a short time after ranged between 0.8mBGL and 5.4mBGL. All other boreholes remained dry on completion and a short time after drilling.

7.3 Field Screening

A summary of the field screening results is presented in the following table:

Table 7-2: Summary of Field Screening

<table>
<tr><th>Aspect</th><th>Details</th></tr>
<tr><td>PID Screening of Soil Samples for VOCs</td><td>PID soil sample headspace readings are presented in attached report tables and the COC documents attached in the appendices. The results ranged from 0ppm to 8.3ppm equivalent isobutylene. These results indicate a lack of significant concentrations of PID detectable VOCs and were consistent with observations (i.e. no hydrocarbon-type odours or staining).</td></tr>
<tr><td>Bulk Screening for Asbestos</td><td>The bulk field screening results are summarised in the attached report Table S5 in Appendix B. FCF/ACM was not detected in any of the bulk field screening samples. All results were below the SAC.</td></tr>
<tr><td>PID Screening of Monitoring Wells for VOCs</td><td>PID monitoring wells headspace readings are presented in field sheets attached in the appendices. The results ranged from 0.5ppm to 1ppm equivalent isobutylene. These results indicate a lack of significant concentrations of PID detectable VOCs were present in the well headspace.</td></tr>
<tr><td>Groundwater Depth & Flow</td><td>SWLs measured in the monitoring wells installed at the site ranged from 0.81mBGL to 4.38mBGL. Survey levels of the wells ranged from 873.70mAHD to 876.22mAHD. Groundwater RLs calculated on these measurements ranged from 78.60m to 82.83m.

<table>
<tr><th>MW reference</th><th>Reduced Level (mAHD)</th><th>SWL (28 October 2022)</th><th>SWL (mAHD)</th></tr>
<tr><td>MW1</td><td>873.70</td><td>4.38</td><td>869.32</td></tr>
<tr><td>MW12</td><td>875.46</td><td>3.43</td><td>872.03</td></tr>
<tr><td>MW15</td><td>876.22</td><td>0.81</td><td>875.41</td></tr>
</table>

A contour plot was prepared for the groundwater levels as shown on Figure 5. Groundwater flow generally occurs in a down gradient direction perpendicular to the groundwater elevation contours. The contour plot indicates that groundwater generally flows towards the north/north-east. This was consistent with expectations based on the topography and the location of the Belubula River.</td></tr>
<tr><td>Groundwater Field Parameters</td><td>Field measurements recorded during sampling were as follows:
- pH ranged from 5.81 to 6.35;
- EC ranged from 172.2µS/cm to 675µS/cm;
- Eh ranged from 57.1mV to 77.7mV; and
- DO ranged from 5.0mg/L to 6.8ppm.</td></tr>
<tr><td>LNAPLs petroleum hydrocarbons</td><td>Phase separated product (i.e. LNAPL) were not detected using the interphase probe during groundwater sampling.</td></tr>
</table>

7.4 Soil Laboratory Results

The soil laboratory results were assessed against the SAC presented in Section 6.1. Individual SAC are shown in the report tables attached in the appendices. A summary of the results is presented below:

7.4.1 Human Health and Environmental (Ecological) Assessment

Table 7-3: Summary of Soil Laboratory Results – Human Health and Environmental (Ecological)

Analyte	N	Max. (mg/kg)	N> Human Health SAC	N> Ecological SAC	Comments
Arsenic	14	19	0	0	-
Cadmium	14	<0.4	0	NSL	-
Chromium (total)	14	360	2	0	The reported chromium concentrations of 270mg/kg and 360mg/kg in BH1 (0.5-0.8m) BH20 (0.5-0.7m), exceeded the health based SAC of 100mg/kg.
Copper	14	86	0	0	-
Lead	14	260	0	0	-
Mercury	14	0.8	0	NSL	-
Nickel	14	310	0	0	-
Zinc	14	200	0	0	-
Total PAHs	14	0.79	0	NSL	-
Benzo(a)pyrene	14	0.2	NSL	0	-
Carcinogenic PAHs (as BaP TEQ)	14	<0.5	0	NSL	-
Naphthalene	14	<1	0	NSL	-
DDT+DDE+DDD	10	<0.1	0	NSL	-
DDT	10	<0.1	NSL	0	-
Aldrin and dieldrin	10	<0.1	0	NSL	-
Chlordane	10	<0.1	0	NSL	-
Heptachlor	10	<0.1	0	NSL	-
Chlorpyrifos (OPP)	10	<0.1	0	NSL	-

Analyte	N	Max. (mg/kg)	N> Human Health SAC	N> Ecological SAC	Comments
PCBs	10	<0.1	0	NSL	-
TRH F1	14	<25	0	0	-
TRH F2	14	<50	0	00	--
TRH F3	14	250	0	0	-
TRH F4	14	440	0	0	-
Benzene	14	<0.2	0	0	-
Toluene	14	<0.5	0	0	-
Ethylbenzene	14	<1	0	0	-
Xylenes	14	<1	0	0	-
Asbestos (in soil) (%w/w)	13	<0.01%w/w ACM <0.0085%w/w AF/FA	1	NA	The reported AF/FA concentration of 0.0085%w/w in BH3 (0.4-0.65m) exceeded the health based SAC (HSL-A) of 0.001%w/w.

Notes:

N: Total number (primary samples)

NSL: No set limit

NL: Not limiting

7.4.2 Waste Classification Assessment

The laboratory results were assessed against the criteria presented in Section 6. A summary of the results is presented in the following table:

Table 7-4: Summary of Soil Laboratory Results Compared to CT and SCC Criteria

Analyte	N	N > CT Criteria	N > SCC Criteria	Comments
Arsenic	14	0	0	-
Cadmium	14	0	0	-
Chromium	14	2	0	Chromium concentrations exceeded the CT1 criterion in two fill samples collected from BH1 (0.5-0.8m) and BH20 (0.5-0.7m). The maximum chromium concentration was 360mg/kg.
Copper	14	NSL	NSL	-
Lead	14	1	0	The lead concentration in BH3 (0.4-0.56m) exceeded the CT1 criterion. The lead concentration was 260mg/kg.
Mercury	14	0	0	-

Analyte	N	N > CT Criteria	N > SCC Criteria	Comments
Nickel	14	2	0	Nickel concentrations exceeded the CT1 criterion in two fill samples collected from BH1 (0.5-0.8m) and BH20 (0.5-0.7m). The maximum nickel concentration was 310mg/kg.
Zinc	14	NSL	NSL	-
TRH (C_6-C_9)	14	0	0	-
TRH (C_{10}-C_{36})	14	0	0	-
BTEX	14	0	0	-
Total PAHs	14	0	0	-
Benzo(a)pyrene	14	0	0	-
OCPs & OPPs	10	0	0	-
PCBs	10	0	0	-
Asbestos	13	-	-	Asbestos was detected in the soil sample from BH3 (0.4-0.65m).

N: Total number (primary samples)
NSL: No set limit

Table 7-5: Summary of Soil Laboratory Results Compared to TCLP Criteria

Analyte	N	N > TCLP Criteria	Comments
Chromium	2	0	-
Lead	1	0	-
Nickel	2	0	-

N: Total number (primary samples)

7.5 Groundwater Laboratory Results

The soil laboratory results were assessed against the SAC presented in Section 6.2. Individual SAC are shown in the report tables attached in the appendices. A summary of the results is presented below:

Table 7-6: Summary of Groundwater Laboratory Results – Human Health and Environmental (Ecological)

Analyte	N ^	Max. (µg/L)	N> Human Health SAC	N> Ecological SAC	Comments
Arsenic	3	<1	0	0	-
Cadmium	3	<0.1	0	0	-

Analyte	N ^	Max. (µg/L)	N> Human Health SAC	N> Ecological SAC	Comments
Chromium (total)	3	<1	0	0	-
Copper	3	<1	0	0	-
Lead	3	<1	0	0	-
Mercury	3	<0.05	0	0	-
Nickel	3	3	0	0	-
Zinc	3	29	0	3	The zinc concentrations of between 15µg/L and 29µg/L in all samples, exceeded the ecological SAC of 8µg/L.
Total PAHs	3	<0.1	0	0	-
Benzo(a)pyrene	3	<0.1	0	0	-
Naphthalene	3	<0.2	0	0	-
TRH F1	3	16	0	NSL	-
TRH F2	3	120	1	NSL	The TRH F2 concentration of 120µg/L in MW1 and its field duplicate WDUP2, exceeded the SSA criterion of 100µg/L.
TRH F3	3	<100	NSL	NSL	-
TRH F4	3	<100	NSL	NSL	-
Benzene	3	<1	0	0	-
Toluene	3	<1	0	0	-
Ethylbenzene	3	<1	0	0	-
m+p-Xylene	3	<2	0	0	-
o-Xylene	3	<1	0	0	-
Total Xylenes	3	<1	0	0	-
VOCs Chloroform Bromodichloromethane	3	 12 3	 0 NSL	 0 NSL	-
pH	3	7.1	1	1	The pH of MW15 was outside the health based and ecological based ranges of 6.5 to 8.5.

Analyte	N ^	Max. (µg/L)	N> Human Health SAC	N> Ecological SAC	Comments
EC	3	1,200	NSL	NSL	-

Notes:

^: Primary samples

N: Total number

NSL: No set limit

NL: Not limiting

8 WASTE CLASSIFICATION ASSESSMENT

The following waste classification does not apply to material within the vicinity of the UST pits. Further assessment will be required prior to classification of this material.

8.1 Preliminary Waste Classification of Fill

Based on the results of the waste classification assessment, and at the time of reporting, the fill material is assigned a preliminary classification of **General Solid Waste (non-putrescible) containing Special Waste (asbestos)**.

Once the final development design is known, additional sampling and analysis should be undertaken to confirm the waste classification(s) for soil prior to off-site disposal.

8.2 Preliminary Classification of Natural Soil

Based on the scope of work undertaken for this assessment, and at the time of reporting, JKE is of the opinion that the natural soil at the site is likely to meet the definition of **VENM** for off-site disposal or re-use purposes.

9 DISCUSSION

9.1 Tier 1 Risk Assessment and Review of CSM

For a contaminant to represent a risk to a receptor, the following three conditions must be present:

1. Source – The presence of a contaminant;
2. Pathway – A mechanism or action by which a receptor can become exposed to the contaminant; and
3. Receptor – The human or ecological entity which may be adversely impacted following exposure to contamination.

If one of the above components is missing, the potential for adverse risks is relatively low.

9.1.1 Soil

Chromium was detected in fill/soil at concentrations above the health-based SAC in BH1 and BH20 (refer to Figure 4). The source of the chromium is considered likely to be associated with imported fill material which was encountered to varying depths across the site. The chromium at the site was encountered in fill/soil beneath the paved carpark in the south-east of the site, as such there is not considered to be a complete SPR-linkage to human receptors in the current site configuration. Notwithstanding, we note that the SAC for chromium is based on hexavalent chromium and the analysis undertaken was for total chromium. It is more likely that the total chromium concentrations reported include larger amounts of chromium III compared to hexavalent chromium, and therefore risks from chromium may be negligible. Further analysis will be necessary to confirm this assumption.

Asbestos as AF/FA was detected in fill/soil at a concentration above the SAC in BH3 (refer to Figure 4). The asbestos was in the friable form based on the lab identification of asbestos in matted material, and based on the NEPM (2013) definitions. The source of the asbestos is considered likely to be associated with either imported fill material which was encountered to varying depths across the site and/or waste generated during historical demolition activities at the site that was subsequently mixed in with the fill/soil matrix during previous site levelling works. The asbestos at the site was encountered in fill/soil beneath the paved carpark in the south-east of the site, as such there is not considered to be a complete SPR-linkage to human receptors in the current site configuration and whilst the fill is not disturbed as there is a low potential for airborne asbestos fibres to be generated and for the SPR-linkage to become complete. Further assessment, management and remediation of asbestos in fill at the site is considered to be necessary.

Further localised assessment of residual contamination associated with the UST is considered to be required. Removal of the UST and any buried infrastructure along with any residual localised contamination should be undertaken in accordance with a Remediation Action Plan (RAP).

Elevated concentrations of the other CoPC were not encountered above the adopted SAC in any of the soil samples analysed during the PSI.

9.1.2 Groundwater

TRH F2 concentrations in MW1/WDUP2 were above the adopted SSA-criterion of 100µg/L (refer to Figure 4). However, the SWL in MW1 was 4.38mBGL, therefore applying the NEPM (2013) HSL SAC of 1,000µg/L is more appropriate and this would imply that vapour intrusion risks associated with the reported TRH F2 concentrations in MW1/ WDUP2 are likely to be negligible.

During installation of the wells and sampling of the groundwater, no odours or staining were encountered. It is noted that MW1 is located in close proximity to the redundant UST outside the maintenance shed (refer to Figure 2 and 3). The source of the TRH in groundwater is considered likely to be associated with the redundant UST. Further investigation is required to confirm this.

The extent of the TRH F2 impacts in groundwater is not well characterised at the site. In the current site configuration, there is not considered to be a complete SPR linkage given there are no buildings or structures in the vicinity of MW1 and considering the NEPM (2013) HSL for TRH F2 under the conditions encountered at this location.

The groundwater samples encountered zinc concentrations above the ANZG-Fresh SAC of 8µg/L. The source of the heavy metal (zinc) in the groundwater is considered likely to be a regional issue for the following reasons:

- The reported concentrations across the monitoring well network at the site were relatively consistent;
- Elevated heavy metal concentrations associated with leaking water infrastructure and surface water runoff are typically encountered in urban groundwater; and
- Significantly elevated zinc concentrations (i.e. above the HILs) were not encountered in the fill soil at the site, therefore fill is not considered to be a point source.

Elevated concentrations of the other CoPC were not encountered above the adopted SAC in the groundwater samples analysed and therefore are not considered to pose a risk to the receptors at the concentrations reported to date. The occurrence of trace concentrations of chloroform and bromodichloromethane is considered likely to be associated with interference from potable water (e.g. leaking pipes/potable water infrastructure). These VOCs are trihalomethanes which are a biproduct of the drinking water chlorination process.

9.2 Decision Statements

The decision statements are addressed below:

Are any results above the SAC?

Yes. In fill/soil chromium and asbestos (as AF/FA) were reported above the health based SAC. In groundwater, TRH F2 was reported above the SSA health based SAC, and zinc was reported above the ecological SAC.

Do potential risks associated with contamination exist, and if so, what are they?

Yes, there are potential health based risks associated with chromium and asbestos in fill/soil. The occurrence of zinc in groundwater is not considered to be associated with on-site contamination and risks from volatile TRH F2 in MW1 were assessed to be low.

It is also acknowledged that there is potential for residual (and relatively localised) contamination to be present in the vicinity of the UST and any buried infrastructure that exists.

Is further investigation/remediation required?

A Detailed (Stage 2) Site Investigation (DSI) will be required. Based on the preliminary data collected for the PSI, we are of the opinion that remediation will be required. The remediation will need to address the occurrence of asbestos in fill/soil and the redundant UST as a minimum. The DSI will need to occur in order to provide further site characterisation and risk assessment to inform the scope of remediation. We consider that the need to remediate the soils in relation to chromium or the groundwater in relation to hydrocarbons is low. However, this will be confirmed via the DSI process.

Is the site suitable for the proposed development, or can the site be made suitable subject to further characterisation and/or remediation?

JKE is of the opinion that the site can be made suitable for the proposed development outlined in Section 1.1, subject to further characterisation (via a DSI) and remediation.

9.3 Data Gaps

An assessment of data gaps is provided in the following table:

Table 9-1: Data Gap Assessment

Data Gap	Assessment
Soil	Grid based sampling was not undertaken for the PSI, and sample locations were limited by access restrictions imposed by existing buildings and structures, subsurface conditions and client requirements. As this was a preliminary intrusive investigation, a detailed investigation will be required to assess the full extent of soil contamination risks on site. Any risks associated with historical and current land-use should be assessed, along with other identified AEC (including the USTs, AST etc). It is recommended that additional sampling is undertaken via test pits if practicable. For delineation of known asbestos in soil, sampling should be undertaken at twice the minimum sampling density recommended in the Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2021) as (endorsed in NEPM 2013). Additional work to address this data gap is recommended and outlined in Section 10 to address this data gap.

Data Gap	Assessment
Soil vapour	The guidelines indicate that a vapour assessment is required based on the identified AEC and reported concentrations of TRH in groundwater at the site. Additional work to address this data gap is recommended and outlined in Section 10 to address this data gap.
Groundwater	Sampling did not occur in the north or north-east portion of the site due to site conditions and access limitations as noted above. Groundwater wells were also not targeted at the point source AEC (i.e. the USTs/AST). Additional work to address this data gap is recommended and outlined in Section 10 to address this data gap.

10 CONCLUSIONS AND RECOMMENDATIONS

The PSI included a review of existing project information, a site inspection, soil sampling from 10 boreholes and groundwater sampling from three monitoring wells installed at the site. Potential AEC and contamination sources identified at the site included: fill material; fuel storage onsite (abandoned USTs and AST); use of pesticides; hazardous building materials (former and existing buildings and structures); naturally occurring asbestos; and off-site land uses (upgradient ambulance station former UST and motor mechanic).

The boreholes encountered fill materials to depths of approximately 0.3mBGL to 1.2mBGL, underlain by silty or clayey residual soils. The fill contained inclusions of brick and tile fragments, igneous, ironstone and sandstone gravel, clay nodules, slag, ash, coal and root fibres. There was no FCF/ACM identified in any of the bulk asbestos quantification field screening samples.

A selection of soil and groundwater samples were analysed for the CoPC. Chromium and asbestos (as AF/FA) were identified in fill/soil at concentrations that exceeded the health based SAC. In groundwater, TRH F2 was reported above the health based SAC and zinc was reported above the ecological SAC.

The PSI has not identified contamination that would preclude the proposed development/use of the site. However, a DSI is required to facilitate development of a RAP and remediation will be required to render the site suitable for the proposed development. We recommend the following:

1. Prepare a Sampling, Analysis and Quality Plan (SAQP) for the DSI;
2. Undertake a DSI in accordance with the SAQP; and
3. Develop and implement a RAP based on the combined findings of the PSI and DSI. Any requirements documented in a RAP are to be implemented and the site is to be remediated and validated.

At this stage, JKE consider that there is currently no requirement to report any site contamination to the NSW EPA under the NSW EPA Guidelines on the Duty to Report Contamination under Section 60 of the CLM Act 1997 (2015). This will be further evaluated as part of the DSI.

JKE consider that the report objectives outlined in Section 1.2 have been addressed.

11 LIMITATIONS

The report limitations are outlined below:

- JKE accepts no responsibility for any unidentified contamination issues at the site. Any unexpected problems/subsurface features that may be encountered during development works should be inspected by an environmental consultant as soon as possible;
- Previous use of this site may have involved excavation for the foundations of buildings, services, and similar facilities. In addition, unrecorded excavation and burial of material may have occurred on the site. Backfilling of excavations could have been undertaken with potentially contaminated material that may be discovered in discrete, isolated locations across the site during construction work;
- This report has been prepared based on site conditions which existed at the time of the investigation; scope of work and limitation outlined in the JKE proposal; and terms of contract between JKE and the client (as applicable);
- The conclusions presented in this report are based on investigation of conditions at specific locations, chosen to be as representative as possible under the given circumstances, visual observations of the site and immediate surrounds and documents reviewed as described in the report;
- Subsurface soil and rock conditions encountered between investigation locations may be found to be different from those expected. Groundwater conditions may also vary, especially after climatic changes;
- The investigation and preparation of this report have been undertaken in accordance with accepted practice for environmental consultants, with reference to applicable environmental regulatory authority and industry standards, guidelines and the assessment criteria outlined in the report;
- Where information has been provided by third parties, JKE has not undertaken any verification process, except where specifically stated in the report;
- JKE has not undertaken any assessment of off-site areas that may be potential contamination sources or may have been impacted by site contamination, except where specifically stated in the report;
- JKE accept no responsibility for potentially asbestos containing materials that may exist at the site. These materials may be associated with demolition of pre-1990 constructed buildings or fill material at the site;
- JKE have not and will not make any determination regarding finances associated with the site;
- Additional investigation work may be required in the event of changes to the proposed development or landuse. JKE should be contacted immediately in such circumstances;
- Material considered to be suitable from a geotechnical point of view may be unsatisfactory from a soil contamination viewpoint, and vice versa; and
- This report has been prepared for the particular project described and no responsibility is accepted for the use of any part of this report in any other context or for any other purpose.

Important Information About This Report

These notes have been prepared by JKE to assist with the assessment and interpretation of this report.

The Report is based on a Unique Set of Project Specific Factors
This report has been prepared in response to specific project requirements as stated in the JKE proposal document which may have been limited by instructions from the client. This report should be reviewed, and if necessary, revised if any of the following occur:

- The proposed land use is altered;
- The defined subject site is increased or sub-divided;
- The proposed development details including size, configuration, location, orientation of the structures or landscaped areas are modified;
- The proposed development levels are altered, eg addition of basement levels; or
- Ownership of the site changes.

JKE will not accept any responsibility whatsoever for situations where one or more of the above factors have changed since completion of the investigation. If the subject site is sold, ownership of the investigation report should be transferred by JKE to the new site owners who will be informed of the conditions and limitations under which the investigation was undertaken. No person should apply an investigation for any purpose other than that originally intended without first conferring with the consultant.

Changes in Subsurface Conditions
Subsurface conditions are influenced by natural geological and hydrogeological process and human activities. Groundwater conditions are likely to vary over time with changes in climatic conditions and human activities within the catchment (e.g. water extraction for irrigation or industrial uses, subsurface waste water disposal, construction related dewatering). Soil and groundwater contaminant concentrations may also vary over time through contaminant migration, natural attenuation of organic contaminants, ongoing contaminating activities and placement or removal of fill material. The conclusions of an investigation report may have been affected by the above factors if a significant period of time has elapsed prior to commencement of the proposed development.

This Report is based on Professional Interpretations of Factual Data
Site investigations identify actual subsurface conditions at the actual sampling locations at the time of the investigation. Data obtained from the sampling and subsequent laboratory analyses, available site history information and published regional information is interpreted by geologists, engineers or environmental scientists and opinions are drawn about the overall subsurface conditions, the nature and extent of contamination, the likely impact on the proposed development and appropriate remediation measures.

Actual conditions may differ from those inferred, because no professional, no matter how qualified, and no subsurface exploration program, no matter how comprehensive, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than an investigation indicates. Actual conditions in areas not sampled may differ from predictions. Nothing can be done to prevent the unanticipated, but steps can be taken to help minimise the impact. For this reason, site owners should retain the services of their consultants throughout the development stage of the project, to identify variances, conduct additional tests which may be needed, and to recommend solutions to problems encountered on site.

Investigation Limitations
Although information provided by a site investigation can reduce exposure to the risk of the presence of contamination, no environmental site investigation can eliminate the risk. Even a rigorous professional investigation may not detect all contamination on a site. Contaminants may be present in areas that were not surveyed or sampled, or may migrate to areas which showed no signs of contamination when sampled. Contaminant analysis cannot possibly cover every type of contaminant which may occur; only the most likely contaminants are screened.

Misinterpretation of Site Investigations by Design Professionals

Costly problems can occur when other design professionals develop plans based on misinterpretation of an investigation report. To minimise problems associated with misinterpretations, the environmental consultant should be retained to work with appropriate professionals to explain relevant findings and to review the adequacy of plans and specifications relevant to contamination issues.

Logs Should not be Separated from the Investigation Report

Borehole and test pit logs are prepared by environmental scientists, engineers or geologists based upon interpretation of field conditions and laboratory evaluation of field samples. Logs are normally provided in our reports and these should not be re-drawn for inclusion in site remediation or other design drawings, as subtle but significant drafting errors or omissions may occur in the transfer process. Photographic reproduction can eliminate this problem, however contractors can still misinterpret the logs during bid preparation if separated from the text of the investigation. If this occurs, delays, disputes and unanticipated costs may result. In all cases it is necessary to refer to the rest of the report to obtain a proper understanding of the investigation. Please note that logs with the 'Environmental Log' header are not suitable for geotechnical purposes as they have not been peer reviewed by a Senior Geotechnical Engineer.

To reduce the likelihood of borehole and test pit log misinterpretation, the complete investigation should be available to persons or organisations involved in the project, such as contractors, for their use. Denial of such access and disclaiming responsibility for the accuracy of subsurface information does not insulate an owner from the attendant liability. It is critical that the site owner provides all available site information to persons and organisations such as contractors.

Read Responsibility Clauses Closely

Because an environmental site investigation is based extensively on judgement and opinion, it is necessarily less exact than other disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, model clauses have been developed for use in written transmittals. These are definitive clauses designed to indicate consultant responsibility. Their use helps all parties involved recognise individual responsibilities and formulate appropriate action. Some of these definitive clauses are likely to appear in the environmental site investigation, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to any questions.

Appendix A: Report Figures

AERIAL IMAGE SOURCE: MAPS.SIX.NSW.GOV.AU

This plan should be read in conjunction with the Environmental report.

Title: **SITE LOCATION PLAN**

Location: BLAYNEY DISTRICT HOSPITAL, 3 OSMAN STREET, BLAYNEY, NSW

Project No: E35521PT

Figure No: 1

JKEnvironments

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LEGEND

APPROXIMATE SITE BOUNDARY

AERIAL IMAGE SOURCE: MAPS.SIX.NSW.GOV.AU

0 8 16 24 32 40

SCALE 1:800 @A3 METRES

This plan should be read in conjunction with the Environmental report.

Title: **SITE FEATURES PLAN**

Location: BLAYNEY DISTRICT HOSPITAL, 3 OSMAN STREET, BLAYNEY, NSW

Project No: E35521PT

Figure No: 2

JKEnvironments

PLOT DATE: 18/11/2022 9:13:56 AM DWG FILE: K:\5C EIS JOBS\35000'S\E35521PT BLAYNEY\CAD\E35521PT.DWG

LEGEND

APPROXIMATE SITE BOUNDARY	
BH(Fill Depth)	BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m) (JKG/JKE COMBINED)
BH/MW(Fill Depth)	BOREHOLE AND GROUNDWATER MONITORING WELL LOCATION, NUMBER AND DEPTH OF FILL (m) (JKG/JKE COMBINED)
BH(Fill Depth)	BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m) (JKG ONLY)

AERIAL IMAGE SOURCE: MAPS.SIX.NSW.GOV.AU

0 8 16 24 32 40

SCALE 1:800 @A3 METRES

This plan should be read in conjunction with the Environmental report.

Title: **SAMPLE LOCATION PLAN**

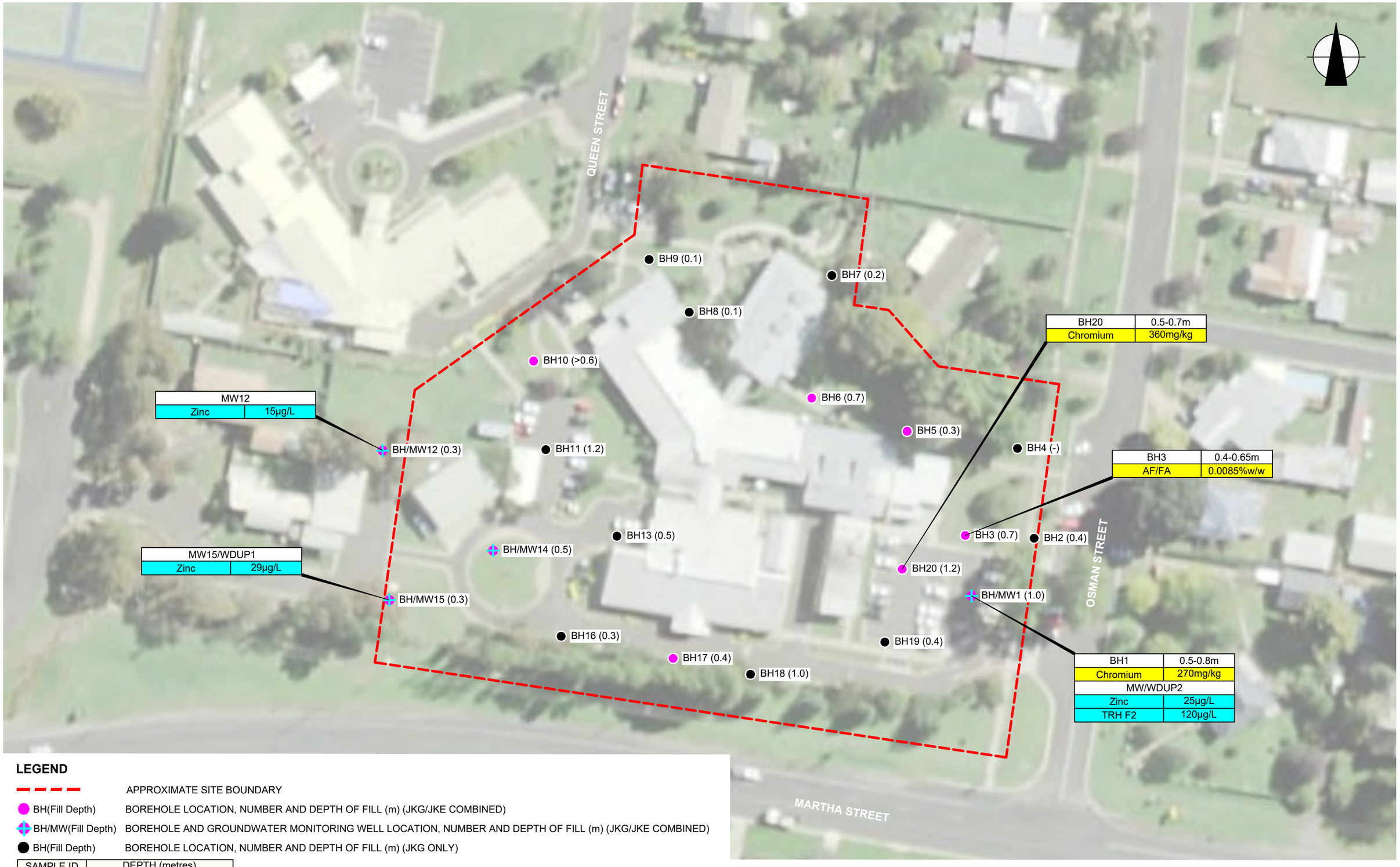
Location: BLAYNEY DISTRICT HOSPITAL, 3 OSMAN STREET, BLAYNEY, NSW

Project No: E35521PT

Figure No: 3

JKEnvironments

PLOT DATE: 21/12/2022 11:25:13 AM DWG FILE: K:\SC EIS JOBS\35000'S\E35521PT BLAYNEY\CADE35521PT.DWG



LEGEND

- APPROXIMATE SITE BOUNDARY
- BH(Fill Depth) — BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m) (JKG/JKE COMBINED)
- BH/MW(Fill Depth) — BOREHOLE AND GROUNDWATER MONITORING WELL LOCATION, NUMBER AND DEPTH OF FILL (m) (JKG/JKE COMBINED)
- BH(Fill Depth) — BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m) (JKG ONLY)

SAMPLE ID	DEPTH (metres)
CHEMICAL	CONCENTRATION

SOIL/SURFACE SAMPLE EXCEEDANCE

SAMPLE ID	-
CHEMICAL	CONCENTRATION (µg/L)

GROUNDWATER SAMPLE EXCEEDANCE

SOIL/SURFACE CONTAMINATION ABOVE SAC FOR HUMAN HEALTH RISK

GROUNDWATER CONTAMINATION ABOVE SAC

AERIAL IMAGE SOURCE: MAPS.SIX.NSW.GOV.AU

0 8 16 24 32 40

SCALE 1:800 @A3 METRES

This plan should be read in conjunction with the Environmental report.

Title: **SAC EXCEEDANCE PLAN**

Location: BLAYNEY DISTRICT HOSPITAL, 3 OSMAN STREET, BLAYNEY, NSW

Project No: E35521PT

Figure No: 4

JKEnvironments

PLOT DATE: 21/12/2022 11:25:29 AM DWG FILE: K:\5C EIS JOBS\35000'S\E35521PT BLAYNEY\CAD\E35521PT.DWG

LEGEND

APPROXIMATE SITE BOUNDARY	
BH(Fill Depth)	BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m) (JKG/JKE COMBINED)
BH/MW(Fill Depth)	BOREHOLE AND GROUNDWATER MONITORING WELL LOCATION, NUMBER AND DEPTH OF FILL (m) (JKG/JKE COMBINED)
BH(Fill Depth)	BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m) (JKG ONLY)
871	GROUNDWATER CONTOUR INTERVALS (m)
	INFERRED GROUNDWATER FLOW DIRECTION

AERIAL IMAGE SOURCE: MAPS.SIX.NSW.GOV.AU

0 8 16 24 32 40

SCALE 1:800 @A3 METRES

This plan should be read in conjunction with the Environmental report.

Title: **GROUNDWATER CONTOUR PLOT**

Location: BLAYNEY DISTRICT HOSPITAL, 3 OSMAN STREET, BLAYNEY, NSW

Project No: E35521PT

Figure No: 5

JKEnvironments

PLOT DATE: 21/12/2022 11:25:35 AM DWG FILE: K:\5C EIS JOBS\35000'S\E35521PT BLAYNEY\CADE\35521PT.DWG

Appendix B: Laboratory Results Summary Tables

ABBREVIATIONS AND EXPLANATIONS

Abbreviations used in the Tables:

ABC: Ambient Background Concentration
ACM: Asbestos Containing Material
ADWG: AustralianDrinking Water Guidelines
AF: Asbestos Fines
ANZG Australian and New Zealand Guidelines
B(a)P: Benzo(a)pyrene
CEC: Cation Exchange Capacity
CRC: Cooperative Research Centre
CT: Contaminant Threshold
EILs: Ecological Investigation Levels
ESLs: Ecological Screening Levels
FA: Fibrous Asbestos
GIL: Groundwater Investigation Levels
GSW: General Solid Waste
HILs: Health Investigation Levels
HSLs: Health Screening Levels
HSL-SSA: Health Screening Level-SiteSpecific Assessment
kg/L kilograms per litre
NA: Not Analysed
NC: Not Calculated
NEPM: National Environmental Protection Measure
NHMRC: National Health and Medical Research Council
NL: Not Limiting
NSL: No Set Limit
OCP: Organochlorine Pesticides
OPP: Organophosphorus Pesticides
PAHs: Polycyclic Aromatic Hydrocarbons
%w/w: weight per weight
ppm: Parts per million
PCBs: Polychlorinated Biphenyls
PCE: Perchloroethylene (Tetrachloroethylene or Teterachloroethene)
pH_{KCL} : pH of filtered 1:20, 1M KCL extract, shaken overnight
pH_{ox} : pH of filtered 1:20 1M KCl after peroxide digestion
PQL: Practical Quantitation Limit
RS: Rinsate Sample
RSL: Regional Screening Levels
RSW: Restricted Solid Waste
SAC: Site Assessment Criteria
SCC: Specific Contaminant Concentration
S_{Cr}: Chromium reducible sulfur
S_{POS}: Peroxide oxidisable Sulfur
SSA: Site Specific Assessment
SSHSLs: Site Specific Health Screening Levels
TAA: Total Actual Acidity in 1M KCL extract titrated to pH6.5
TB: Trip Blank
TCA: 1,1,1 Trichloroethane (methyl chloroform)
TCE: Trichloroethylene (Trichloroethene)
TCLP: Toxicity Characteristics Leaching Procedure
TPA: Total Potential Acidity, 1M KCL peroxide digest
TS: Trip Spike
TRH: Total Recoverable Hydrocarbons
TSA: Total Sulfide Acidity (TPA-TAA)
UCL: Upper Level Confidence Limit on Mean Value
USEPA United States Environmental Protection Agency
VOCC: Volatile Organic Chlorinated Compounds
WHO: World Health Organisation

Table Specific Explanations:

HIL Tables:

- The chromium results are for Total Chromium which includes Chromium III and VI. For initial screening purposes, we have assumed that the samples contain only Chromium VI unless demonstrated otherwise by additional analysis.
- Carcinogenic PAHs is a toxicity weighted sum of analyte concentrations for a specific list of PAH compounds relative to B(a)P. It is also refered to as the B(a)P Toxic Equivalence Quotient (TEQ).
- Statistical calculations are undertaken using ProUCL (USEPA). Statistical calculation is usually undertaken using data from fill samples.

EIL/ESL Table:

- ABC Values for selected metals have been adopted from the published background concentrations presented in Olszowy et. al., (1995), Trace Element Concentrations in Soils from Rural and Urban New South Wales (the 25th percentile values for old suburbs with high traffic have been quoted).

Waste Classification and TCLP Table:

- Data assessed using the NSW EPA Waste Classification Guidelines, Part 1: Classifying Waste (2014).
- The assessment of Total Moderately Harmful pesticides includes: Dichlorovos, Dimethoate, Fenitrothion, Ethion, Malathion and Parathion.
- Assessment of Total Scheduled pesticides include: HBC, alpha-BHC, gamma-BHC, beta-BHC, Heptachlor, Aldrin, Heptachlor Epoxide, gamma-Chlordane, alpha-chlordane, pp-DDE, Dieldrin, Endrin, pp-DDD, pp-DDT, Endrin Aldehyde.

QA/QC Table:

- Field blank, Inter and Intra laboratory duplicate results are reported in mg/kg.
- Trip spike results are reported as percentage recovery.
- Field rinsate results are reported in µg/L.

TABLE S1
SOIL LABORATORY RESULTS COMPARED TO NEPM 2013.
HIL-A: 'Residential with garden/accessible soils; children's day care centers; preschools; and primary schools'

All data in mg/kg unless stated otherwise			HEAVY METALS								PAHs		ORGANOCHLORINE PESTICIDES (OCPs)							OP PESTICIDES (OPPs)	TOTAL PCBs	ASBESTOS FIBRES
			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	Carcinogenic PAHs	HCB	Endosulfan	Methoxychlor	Aldrin & Dieldrin	Chlordane	DDT, DDD & DDE	Heptachlor	Chlorpyrifos		
PQL - Envirolab Services			4	0.4	1	1	1	0.1	1	1	-	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	100
Site Assessment Criteria (SAC)			100	20	100	6000	300	40	400	7400	300	3	10	270	300	6	50	240	6	160	1	Detected/Not Detected
Sample Reference	**Sample Depth**	**Sample Description**																				
BH1	0.05-0.2	F: Clayey sand	<4	<0.4	**10**	**24**	**1**	<0.1	**3**	**7**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH1 - [LAB_DUP]	0.05-0.2	F: Clayey sand	<4	<0.4	**9**	**34**	**2**	<0.1	**3**	**8**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH1	0.5-0.8	F: Gravelly clayey sand	<4	<0.4	**270**	**41**	**2**	<0.1	**220**	**15**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH1	3.0-3.2	Silty clay	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Not Detected
BH3	0-0.1	F: Silty clay	**9**	<0.4	**53**	**30**	**18**	<0.1	**14**	**54**	**0.79**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH3	0.4-0.65	F: Silty clay	**17**	<0.4	**30**	**42**	**260**	**0.1**	**15**	**180**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	Detected
BH5	0-0.1	F: Silt	<4	<0.4	**19**	**36**	**40**	**0.8**	**7**	**200**	**0.09**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH5	0.5-0.7	Silty clay	<4	<0.4	**19**	**12**	**10**	**0.2**	**6**	**32**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH6	0-0.1	F: Silty clay	<4	<0.4	**26**	**38**	**11**	<0.1	**7**	**36**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH10	0-0.2	F: Silty clay	<4	<0.4	**21**	**18**	**16**	<0.1	**10**	**26**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH12	0-0.1	Silty clay	<4	<0.4	**29**	**18**	**19**	<0.1	**4**	**32**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH12	1.5-1.7	Silty clay	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Not Detected
BH13	1.5-1.7	Silty clay	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Not Detected
BH14	0-0.1	F: Silty clay	**12**	<0.4	**32**	**14**	**20**	<0.1	**7**	**23**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH15	0-0.1	F: Silty clay	**4**	<0.4	**28**	**15**	**15**	<0.1	**6**	**26**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH17	0.05-0.2	F: Clayey sand	<4	<0.4	**23**	**20**	**2**	<0.1	**3**	**14**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH20	0.05-0.2	F: Clayey sand	<4	<0.4	**33**	**52**	**3**	<0.1	**6**	**12**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH20	0.5-0.7	F: Gravelly sand	**12**	<0.4	**360**	**86**	**2**	<0.1	**310**	**13**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	Not Detected
SDUP2	-	BH20 (0.05-0.2)	<4	<0.4	**24**	**46**	**2**	<0.1	**5**	**10**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
SDUP2 [LAB_DUP]	-	BH20 (0.05-0.2)	NA	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	<0.1	NA	NA
SDUP3	-	BH15 0-0.1	<4	<0.4	**29**	**16**	**17**	<0.1	**7**	**28**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
SDUP3 - [LAB_DUP]	-	BH15 0-0.1	<4	<0.4	**25**	**17**	**14**	<0.1	**6**	**27**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Total Number of Samples			18	18	18	18	18	18	18	18	19	19	14	14	14	14	14	14	14	15	14	13
Maximum Value			17	<PQL	360	86	260	0.8	310	200	0.79	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	Detected

Concentration above the SAC **VALUE**
Concentration above the PQL **Bold**

TABLE S2
SOIL LABORATORY RESULTS COMPARED TO HSLs
All data in mg/kg unless stated otherwise

					C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	Field PID Measurement
PQL - Envirolab Services					25	50	0.2	0.5	1	1	1	ppm
NEPM 2013 HSL Land Use Category					**HSL-A/B: LOW/HIGH DENSITY RESIDENTIAL**							
Sample Reference	**Sample Depth**	**Sample Description**	**Depth Category**	**Soil Category**								
BH1	0.05-0.2	F: Clayey sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH1 - [LAB_DUP]	0.05-0.2	F: Clayey sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH1	0.5-0.8	F: Gravelly clayey sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	4
BH3	0-0.1	F: Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH3	0.4-0.65	F: Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.1
BH5	0-0.1	F: Silt	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH5	0.5-0.7	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH6	0-0.1	F: Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH10	0-0.2	F: Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH12	0-0.1	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.1
BH13	1.5-1.7	Silty clay	0m to <1m	Sand	NA	NA	NA	NA	NA	NA	NA	0
BH14	0-0.1	F: Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.2
BH15	0-0.1	F: Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH17	0.05-0.2	F: Clayey sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH20	0.05-0.2	F: Clayey sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH20	0.5-0.7	F: Gravelly sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.5
SDUP2	-	BH20 (0.05-0.2)	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	NA
SDUP2 [LAB_DUP]	-	BH20 (0.05-0.2)	0m to <1m	Sand	NA	<50	NA	NA	NA	NA	NA	NA
SDUP3	-	BH15 0-0.1	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	NA
SDUP3 - [LAB_DUP]	-	BH15 0-0.1	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	NA
Total Number of Samples					18	19	18	18	18	18	18	16
Maximum Value					<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	4

Concentration above the SAC — **VALUE**
Concentration above the PQL — **Bold**
The guideline corresponding to the concentration above the SAC is highlighted in grey in the Site Assessment Criteria Table below

HSL SOIL ASSESSMENT CRITERIA

Sample Reference	**Sample Depth**	**Sample Description**	**Depth Category**	**Soil Category**	C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene
BH1	0.05-0.2	F: Clayey sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH1 - [LAB_DUP]	0.05-0.2	F: Clayey sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH1	0.5-0.8	F: Gravelly clayey sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH3	0-0.1	F: Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH3	0.4-0.65	F: Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH5	0-0.1	F: Silt	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH5	0.5-0.7	Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH6	0-0.1	F: Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH10	0-0.2	F: Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH12	0-0.1	Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH13	1.5-1.7	Silty clay	0m to <1m	Sand	NA	NA	NA	NA	NA	NA	NA
BH14	0-0.1	F: Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH15	0-0.1	F: Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH17	0.05-0.2	F: Clayey sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH20	0.05-0.2	F: Clayey sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH20	0.5-0.7	F: Gravelly sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
SDUP2	-	BH20 (0.05-0.2)	0m to <1m	Sand	45	110	0.5	160	55	40	3
SDUP2 [LAB_DUP]	-	BH20 (0.05-0.2)	0m to <1m	Sand	NA	110	NA	NA	NA	NA	NA
SDUP3	-	BH15 0-0.1	0m to <1m	Sand	45	110	0.5	160	55	40	3
SDUP3 - [LAB_DUP]	-	BH15 0-0.1	0m to <1m	Sand	45	110	0.5	160	55	40	3

TABLE S3
SOIL LABORATORY RESULTS COMPARED TO MANAGEMENT LIMITS
All data in mg/kg unless stated otherwise

			C_6-C_{10} (F1) plus BTEX	>C_{10}-C_{16} (F2) plus napthalene	>C_{16}-C_{34} (F3)	>C_{34}-C_{40} (F4)
PQL - Envirolab Services			25	50	100	100
NEPM 2013 Land Use Category			**RESIDENTIAL, PARKLAND & PUBLIC OPEN SPACE**			
Sample Reference	**Sample Depth**	**Soil Texture**				
BH1	0.05-0.2	Coarse	<25	<50	**120**	**150**
BH1 - [LAB_DUP]	0.05-0.2	Coarse	<25	<50	**180**	**240**
BH1	0.5-0.8	Coarse	<25	<50	<100	<100
BH3	0-0.1	Fine	<25	<50	<100	<100
BH3	0.4-0.65	Fine	<25	<50	<100	<100
BH5	0-0.1	Fine	<25	<50	<100	<100
BH5	0.5-0.7	Fine	<25	<50	<100	<100
BH6	0-0.1	Fine	<25	<50	<100	<100
BH10	0-0.2	Fine	<25	<50	<100	<100
BH12	0-0.1	Fine	<25	<50	**120**	<100
BH14	0-0.1	Fine	<25	<50	<100	<100
BH15	0-0.1	Fine	<25	<50	<100	<100
BH17	0.05-0.2	Coarse	<25	<50	<100	<100
BH20	0.05-0.2	Coarse	<25	<50	**190**	**300**
BH20	0.5-0.7	Coarse	<25	<50	<100	<100
SDUP2	-	Coarse	<25	<50	**250**	**440**
SDUP2 [LAB_DUP]	-	Coarse	NA	<50	**230**	**440**
SDUP3	-	Coarse	<25	<50	<100	<100
SDUP3 - [LAB_DUP]	-	Coarse	<25	<50	<100	<100
Total Number of Samples			18	19	19	19
Maximum Value			<PQL	<PQL	250	440

Concentration above the SAC **VALUE**
Concentration above the PQL **Bold**

MANAGEMENT LIMIT ASSESSMENT CRITERIA

Sample Reference	**Sample Depth**	**Soil Texture**	C_6-C_{10} (F1) plus BTEX	>C_{10}-C_{16} (F2) plus napthalene	>C_{16}-C_{34} (F3)	>C_{34}-C_{40} (F4)
BH1	0.05-0.2	Coarse	700	1000	2500	10000
BH1 - [LAB_DUP]	0.05-0.2	Coarse	700	1000	2500	10000
BH1	0.5-0.8	Coarse	700	1000	2500	10000
BH3	0-0.1	Fine	800	1000	3500	10000
BH3	0.4-0.65	Fine	800	1000	3500	10000
BH5	0-0.1	Fine	800	1000	3500	10000
BH5	0.5-0.7	Fine	800	1000	3500	10000
BH6	0-0.1	Fine	800	1000	3500	10000
BH10	0-0.2	Fine	800	1000	3500	10000
BH12	0-0.1	Fine	800	1000	3500	10000
BH14	0-0.1	Fine	800	1000	3500	10000
BH15	0-0.1	Fine	800	1000	3500	10000
BH17	0.05-0.2	Coarse	700	1000	2500	10000
BH20	0.05-0.2	Coarse	700	1000	2500	10000
BH20	0.5-0.7	Coarse	700	1000	2500	10000
SDUP2	-	Coarse	700	1000	2500	10000
SDUP2 [LAB_DUP]	-	Coarse	NA	1000	2500	10000
SDUP3	-	Coarse	700	1000	2500	10000
SDUP3 - [LAB_DUP]	-	Coarse	700	1000	2500	10000

TABLE S4
SOIL LABORATORY RESULTS COMPARED T0 DIRECT CONTACT CRITERIA
All data in mg/kg unless stated otherwise

Analyte		C_6-C_{10}	>C_{10}-C_{16}	>C_{16}-C_{34}	>C_{34}-C_{40}	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	PID
PQL - Envirolab Services		25	50	100	100	0.2	0.5	1	1	1	
CRC 2011 -Direct contact Criteria		4,400	3,300	4,500	6,300	100	14,000	4,500	12,000	1,400	
Site Use		**RESIDENTIAL WITH ACCESSIBLE SOIL- DIRECT SOIL CONTACT**									
Sample Reference	**Sample Depth**										
BH1	0.05-0.2	<25	<50	**120**	**150**	<0.2	<0.5	<1	<1	<1	0
BH1 - [LAB_DUP]	0.05-0.2	<25	<50	**180**	**240**	<0.2	<0.5	<1	<1	<1	0
BH1	0.5-0.8	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**4**
BH3	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH3	0.4-0.65	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.1**
BH5	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH5	0.5-0.7	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH6	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH10	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH12	0-0.1	<25	<50	**120**	<100	<0.2	<0.5	<1	<1	<1	**0.1**
BH13	1.5-1.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	0
BH14	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.2**
BH15	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH17	0.05-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH20	0.05-0.2	<25	<50	**190**	**300**	<0.2	<0.5	<1	<1	<1	0
BH20	0.5-0.7	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.5**
SDUP2	-	<25	<50	**250**	**440**	<0.2	<0.5	<1	<1	<1	NA
SDUP2 [LAB_DUP]	-	NA	<50	**230**	**440**	NA	NA	NA	NA	NA	NA
SDUP3	-	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	NA
SDUP3 - [LAB_DUP]	-	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	NA
Total Number of Samples		18	19	19	19	18	18	18	18	18	16
Maximum Value		<PQL	<PQL	250	440	<PQL	<PQL	<PQL	<PQL	<PQL	4

Concentration above the SAC **VALUE**
Concentration above the PQL **Bold**

JKEnvironments

TABLE S5
ASBESTOS QUANTIFICATION - FIELD OBSERVATIONS AND LABORATORY RESULTS
HSL-A: Residential with garden/accessible soils; children's day care centers; preschools; and primary schools

FIELD DATA															LABORATORY DATA											
Date Sampled	Sample reference	Sample Depth	Visible ACM in top 100mm	Approx. Volume of Soil (L)	Soil Mass (g)	Mass ACM (g)	Mass Asbestos in ACM (g)	[Asbestos from ACM in soil] (%w/w)	Mass ACM <7mm (g)	Mass Asbestos in ACM <7mm (g)	[Asbestos from ACM <7mm in soil] (%w/w)	Mass FA (g)	Mass Asbestos in FA (g)	[Asbestos from FA in soil] (%w/w)	Lab Report Number	Sample refeference	Sample Depth	Sample Mass (g)	Asbestos ID in soil (AS4964) >0.1g/kg	Trace Analysis	Total Asbestos (g/kg)	Asbestos ID in soil <0.1g/kg	ACM >7mm Estimation (g)	FA and AF Estimation (g)	ACM >7mm Estimation %(w/w)	FA and AF Estimation %(w/w)
SAC			**No**					**0.01**			**0.001**			**0.001**											**0.01**	**0.001**
25/10/2022	BH1	0.05-0.5	No	10	10,870	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	309378	BH1	0.05-0.2	870.85	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
25/10/2022	BH1	0.5-1.0	NA	2.5	2,450	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24/10/2022	BH2	0-0.1	No	10	12,600	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24/10/2022	BH2	0.1-0.4	NA	2.5	2,450	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24/10/2022	BH3	0-0.1	No	10	10,470	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24/10/2022	BH3	0.1-0.4	NA	3.5	3,400	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	309378	BH3	0.4-0.65	738.11	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	Chrysotile:Amosite	–	0.0628	<0.01	0.0085
25/10/2022	BH4	0-0.1	No	10	10,300	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
24/10/2022	BH5	0-0.1	No	10	10,530	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	309378	BH5	0-0.1	619.37	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
26/10/2022	BH6	0-0.1	No	10	12,050	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	309378	BH6	0-0.1	777.81	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
26/10/2022	BH7	0-0.1	No	10	11,980	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
27/10/2022	BH8	0-0.1	No	10	11,300	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
28/10/2022	BH9	0-0.1	No	10	7,900	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
28/10/2022	BH10	0-0.2	No	10	11,100	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	309378	BH10	0-0.2	736.87	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
28/10/2022	BH10	0.2-0.4	NA	10	11,050	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
27/10/2022	BH11	0.05-1.0	No	10	9,550	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
27/10/2022	BH11	1.0-1.2	NA	1.5	1,720	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
26/10/2022	BH12	0-0.1	No	10	10,450	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	309378	BH12	0-0.1	758.96	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
27/10/2022	BH13	0.05-0.5	No	4.5	4,450	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
26/10/2022	BH14	0-0.1	No	10	11,280	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	309378	BH14	0-0.1	732.9	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
26/10/2022	BH14	0.1-0.5	NA	4	3,800	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
26/10/2022	BH15	0.0-0.1	No	10	10,900	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	309378	BH15	0-0.1	701.89	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
26/10/2022	BH15	0.1-0.3	NA	3	3,050	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
27/10/2022	BH16	0.05-0.3	No	5.5	5,400	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25/10/2022	BH17	0.05-0.4	No	7	6,790	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	309378	BH17	0.05-0.2	772.09	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001
27/10/2022	BH18	0.05-0.3	No	2.5	2,500	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
27/10/2022	BH18	0.3-1.0	NA	10	8,300	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25/10/2022	BH19	0.05-0.4	No	7	7,240	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25/10/2022	BH20	0.05-0.5	No	3.5	3,300	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25/10/2022	BH20	0.5-1.2	NA	4.5	4,770	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	309378	BH20	0.5-0.7	917.51	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	No visible asbestos detected	–	–	<0.01	<0.001

Concentration above the SAC **VALUE**

JKEnvironments

TABLE S6
SOIL LABORATORY RESULTS COMPARED TO NEPM 2013 EILs AND ESLs
All data in mg/kg unless stated otherwise

Land Use Category				URBAN RESIDENTIAL AND PUBLIC OPEN SPACE																		
							AGED HEAVY METALS-EILs						EILs		ESLs							
				pH	CEC (cmolc/kg)	Clay Content (% clay)	Arsenic	Chromium	Copper	Lead	Nickel	Zinc	Naphthalene	DDT	C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	>C_{16}-C_{34} (F3)	>C_{34}-C_{40} (F4)	Benzene	Toluene	Ethylbenzene	Total Xylenes	B(a)P
PQL - Envirolab Services				-	1	-	4	1	1	1	1	1	1	0.1	25	50	100	100	0.2	0.5	1	1	0.05
Ambient Background Concentration (ABC)				-	-	-	NSL	13	28	163	5	122	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL
Sample Reference	**Sample Depth**	**Sample Description**	**Soil Texture**																			
BH1	0.05-0.2	F: Clayey sand	Coarse	NA	NA	NA	<4	**10**	**24**	**1**	**3**	**7**	<1	<0.1	<25	<50	**120**	**150**	<0.2	<0.5	<1	<1	<0.05
BH1 - [LAB_DUP]	0.05-0.2	F: Clayey sand	Coarse	NA	NA	NA	<4	**9**	**34**	**2**	**3**	**8**	<1	<0.1	<25	<50	**180**	**240**	<0.2	<0.5	<1	<1	<0.05
BH1	0.5-0.8	F: Gravelly clayey sand	Coarse	NA	**28**	**8**	<4	**270**	**41**	**2**	**220**	**15**	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH3	0-0.1	F: Silty clay	Fine	NA	NA	NA	**9**	**53**	**30**	**18**	**14**	**54**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	**0.2**
BH3	0.4-0.65	F: Silty clay	Fine	NA	NA	NA	**17**	**30**	**42**	**260**	**15**	**180**	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH5	0-0.1	F: Silt	Fine	**6.65**	**12.5**	NA	<4	**19**	**36**	**40**	**7**	**200**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	**0.09**
BH5	0.5-0.7	Silty clay	Fine	NA	NA	NA	<4	**19**	**12**	**10**	**6**	**32**	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH6	0-0.1	F: Silty clay	Fine	NA	NA	NA	<4	**26**	**38**	**11**	**7**	**36**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH10	0-0.2	F: Silty clay	Fine	NA	NA	NA	<4	**21**	**18**	**16**	**10**	**26**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH12	0-0.1	Silty clay	Fine	NA	NA	NA	<4	**29**	**18**	**19**	**4**	**32**	<1	<0.1	<25	<50	**120**	<100	<0.2	<0.5	<1	<1	<0.05
BH13	1.5-1.7	Silty clay	Fine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH14	0-0.1	F: Silty clay	Fine	NA	NA	NA	**12**	**32**	**14**	**20**	**7**	**23**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH15	0-0.1	F: Silty clay	Fine	NA	NA	NA	**4**	**28**	**15**	**15**	**6**	**26**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH17	0.05-0.2	F: Clayey sand	Coarse	NA	NA	NA	<4	**23**	**20**	**2**	**3**	**14**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH20	0.05-0.2	F: Clayey sand	Coarse	NA	NA	NA	<4	**33**	**52**	**3**	**6**	**12**	<1	<0.1	<25	<50	**190**	**300**	<0.2	<0.5	<1	<1	<0.05
BH20	0.5-0.7	F: Gravelly sand	Coarse	NA	**32**	**7**	**12**	**360**	**86**	**2**	**310**	**13**	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
SDUP2	-	BH20 (0.05-0.2)	Coarse	NA	NA	NA	<4	**24**	**46**	**2**	**5**	**10**	<1	<0.1	<25	<50	**250**	**440**	<0.2	<0.5	<1	<1	<0.05
SDUP2 [LAB_DUP]	-	BH20 (0.05-0.2)	Coarse	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<50	**230**	**440**	NA	NA	NA	NA	<0.05
SDUP3	-	BH15 0-0.1	Coarse	NA	NA	NA	<4	**29**	**16**	**17**	**7**	**28**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
SDUP3 - [LAB_DUP]	-	BH15 0-0.1	Coarse	NA	NA	NA	<4	**25**	**17**	**14**	**6**	**27**	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
Total Number of Samples				1	3	2	18	18	18	18	18	18	18	14	18	19	19	19	18	18	18	18	19
Maximum Value				6.65	32	8	17	360	86	260	310	200	<PQL	<PQL	<PQL	<PQL	250	440	<PQL	<PQL	<PQL	<PQL	0.2

Concentration above the SAC **VALUE**
Concentration above the PQL **Bold**
The guideline corresponding to the elevated value is highlighted in grey in the EIL and ESL Assessment Criteria Table below

EIL AND ESL ASSESSMENT CRITERIA

Sample Reference	**Sample Depth**	**Sample Description**	**Soil Texture**	pH	CEC (cmolc/kg)	Clay Content (% clay)	Arsenic	Chromium	Copper	Lead	Nickel	Zinc	Naphthalene	DDT	C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	>C_{16}-C_{34} (F3)	>C_{34}-C_{40} (F4)	Benzene	Toluene	Ethylbenzene	Total Xylenes	B(a)P
BH1	0.05-0.2	F: Clayey sand	Coarse	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	300	2800	50	85	70	105	20
BH1 - [LAB_DUP]	0.05-0.2	F: Clayey sand	Coarse	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	300	2800	50	85	70	105	20
BH1	0.5-0.8	F: Gravelly clayey sand	Coarse	NA	28	8	100	410	90	1300	360	190	170	--	180	120	300	2800	50	85	70	105	20
BH3	0-0.1	F: Silty clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
BH3	0.4-0.65	F: Silty clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	--	180	120	1300	5600	65	105	125	45	20
BH5	0-0.1	F: Silt	Fine	6.65	12.5	NA	100	200	240	1300	280	820	170	180	180	120	1300	5600	65	105	125	45	20
BH5	0.5-0.7	Silty clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	--	180	120	1300	5600	65	105	125	45	20
BH6	0-0.1	F: Silty clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
BH10	0-0.2	F: Silty clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
BH12	0-0.1	Silty clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
BH13	1.5-1.7	Silty clay	Fine	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BH14	0-0.1	F: Silty clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
BH15	0-0.1	F: Silty clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
BH17	0.05-0.2	F: Clayey sand	Coarse	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	300	2800	50	85	70	105	20
BH20	0.05-0.2	F: Clayey sand	Coarse	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	300	2800	50	85	70	105	20
BH20	0.5-0.7	F: Gravelly sand	Coarse	NA	32	7	100	410	90	1300	420	190	170	--	180	120	300	2800	50	85	70	105	20
SDUP2	-	BH20 (0.05-0.2)	Coarse	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	300	2800	50	85	70	105	20
SDUP2 [LAB_DUP]	-	BH20 (0.05-0.2)	Coarse	NA	NA	NA	--	--	--	--	--	--	--	--	--	120	300	2800	--	--	--	--	20
SDUP3	-	BH15 0-0.1	Coarse	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	300	2800	50	85	70	105	20
SDUP3 - [LAB_DUP]	-	BH15 0-0.1	Coarse	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	300	2800	50	85	70	105	20

TABLE S7
SOIL LABORATORY RESULTS COMPARED TO WASTE CLASSIFICATION GUIDELINES
All data in mg/kg unless stated otherwise

			HEAVY METALS								PAHs		OC/OP PESTICIDES				Total PCBs	TRH					BTEX COMPOUNDS				ASBESTOS FIBRES
			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	B(a)P	Total Endosulfans	Chloropyrifos	Total Moderately Harmful	Total Scheduled		C_6-C_9	C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C_{36}	Total C_{10}-C_{36}	Benzene	Toluene	Ethyl benzene	Total Xylenes	
PQL - Envirolab Services			4	0.4	1	1	1	0.1	1	1	-	0.05	0.1	0.1	0.1	0.1	0.1	25	50	100	100	50	0.2	0.5	1	1	100
General Solid Waste CT1			100	20	100	NSL	100	4	40	NSL	200	0.8	60	4	250	50	50	650		NSL		10,000	10	288	600	1,000	-
General Solid Waste SCC1			500	100	1900	NSL	1500	50	1050	NSL	200	10	108	7.5	250	50	50	650		NSL		10,000	18	518	1,080	1,800	-
Restricted Solid Waste CT2			400	80	400	NSL	400	16	160	NSL	800	3.2	240	16	1000	50	50	2600		NSL		40,000	40	1,152	2,400	4,000	-
Restricted Solid Waste SCC2			2000	400	7600	NSL	6000	200	4200	NSL	800	23	432	30	1000	50	50	2600		NSL		40,000	72	2,073	4,320	7,200	-
Sample Reference	**Sample Depth**	**Sample Description**																									
BH1	0.05-0.2	F: Clayey sand	<4	<0.4	**10**	**24**	**1**	<0.1	**3**	**7**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	**110**	**110**	<0.2	<0.5	<1	<1	Not Detected
BH1 - [LAB_DUI	0.05-0.2	F: Clayey sand	<4	<0.4	**9**	**34**	**2**	<0.1	**3**	**8**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	**170**	**170**	<0.2	<0.5	<1	<1	NA
BH1	0.5-0.8	F: Gravelly clayey sand	<4	<0.4	**270**	**41**	**2**	<0.1	**220**	**15**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH1	3.0-3.2	Silty clay	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Not Detected
BH3	0-0.1	F: Silty clay	**9**	<0.4	**53**	**30**	**18**	<0.1	**14**	**54**	**0.79**	**0.2**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH3	0.4-0.65	F: Silty clay	**17**	<0.4	**30**	**42**	**260**	**0.1**	**15**	**180**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Detected
BH5	0-0.1	F: Silt	<4	<0.4	**19**	**36**	**40**	**0.8**	**7**	**200**	**0.09**	**0.09**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH5	0.5-0.7	Silty clay	<4	<0.4	**19**	**12**	**10**	**0.2**	**6**	**32**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH6	0-0.1	F: Silty clay	<4	<0.4	**26**	**38**	**11**	<0.1	**7**	**36**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH10	0-0.2	F: Silty clay	<4	<0.4	**21**	**18**	**16**	<0.1	**10**	**26**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH12	0-0.1	Silty clay	<4	<0.4	**29**	**18**	**19**	<0.1	**4**	**32**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH12	1.5-1.7	Silty clay	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Not Detected
BH13	1.5-1.7	Silty clay	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Not Detected
BH14	0-0.1	F: Silty clay	**12**	<0.4	**32**	**14**	**20**	<0.1	**7**	**23**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH15	0-0.1	F: Silty clay	**4**	<0.4	**28**	**15**	**15**	<0.1	**6**	**26**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH17	0.05-0.2	F: Clayey sand	<4	<0.4	**23**	**20**	**2**	<0.1	**3**	**14**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH20	0.05-0.2	F: Clayey sand	<4	<0.4	**33**	**52**	**3**	<0.1	**6**	**12**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	**200**	**200**	<0.2	<0.5	<1	<1	NA
BH20	0.5-0.7	F: Gravelly sand	**12**	<0.4	**360**	**86**	**2**	<0.1	**310**	**13**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
SDUP2	-	BH20 (0.05-0.2)	<4	<0.4	**24**	**46**	**2**	<0.1	**5**	**10**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	**310**	**310**	<0.2	<0.5	<1	<1	NA
SDUP2 [LAB_DU	-	BH20 (0.05-0.2)	NA	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.05	NA	<0.1	<0.1	<0.1	NA	NA	<50	<100	**280**	**280**	NA	NA	NA	NA	NA
SDUP3	-	BH15 0-0.1	<4	<0.4	**29**	**16**	**17**	<0.1	**7**	**28**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
SDUP3 - [LAB_D	-	BH15 0-0.1	<4	<0.4	**25**	**17**	**14**	<0.1	**6**	**27**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
Total Number of Samples			18	18	18	18	18	18	18	18	19	19	14	15	15	15	14	18	19	19	19	19	18	18	18	18	13
Maximum Value			17	<PQL	360	86	260	0.8	310	200	0.79	0.2	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	310	310	<PQL	<PQL	<PQL	<PQL	Detected

Concentration above the CT1 — **VALUE**
Concentration above SCC1 — **VALUE**
Concentration above the SCC2 — **VALUE**
Concentration above PQL — **Bold**

TABLE S8
SOIL LABORATORY TCLP RESULTS
All data in mg/L unless stated otherwise

			Arsenic	Cadmium	Chromium	Lead	Mercury	Nickel	B(a)P
PQL - Envirolab Services			0.05	0.01	0.01	0.03	0.0005	0.02	0.001
TCLP1 - General Solid Waste			5	1	5	5	0.2	2	0.04
TCLP2 - Restricted Solid Waste			20	4	20	20	0.8	8	0.16
TCLP3 - Hazardous Waste			>20	>4	>20	>20	>0.8	>8	>0.16
Sample Reference	**Sample Depth**	**Sample Description**							
BH1	0.5-0.8	F: Gravelly clayey sand	NA	NA	<0.01	NA	NA	**0.05**	NA
BH3	0.4-0.65	F: Silty clay	NA	NA	NA	**0.08**	NA	NA	NA
BH20	0.5-0.7	F: Gravelly sand	NA	NA	<0.01	NA	NA	**0.06**	NA
Total Number of samples			0	0	2	1	0	2	0
Maximum Value			NA	NA	<PQL	0.08	NA	0.06	NA

General Solid Waste	**VALUE**
Restricted Solid Waste	**VALUE**
Hazardous Waste	**VALUE**
Concentration above PQL	**Bold**

Preliminary (Stage 1) Site Investigation
3 Osman Street, Blayney, NSW
E35521PT

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TABLE Q1
SOIL QA/QC SUMMARY

			TRH C6 - C10	TRH >C10-C16	TRH >C16-C34	TRH >C34-C40	Benzene	Toluene	Ethylbenzene	m+p-xylene	o-Xylene
	PQL Envirolab SYD		25	50	100	100	0.2	0.5	1	2	1
	PQL Envirolab VIC		25	50	100	100	0.2	0.5	1.0	2.0	1.0
Intra laboratory duplicate	BH15	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1
	SDUP3	-	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1
	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc
Inter laboratory duplicate	BH20	0.05-0.2	<25	<50	190	300	<0.2	<0.5	<1	<2	<1
	SDUP2	-	<25	<50	250	440	<0.2	<0.5	<1	<2	<1
	MEAN		nc	nc	220	370	nc	nc	nc	nc	nc
	RPD %		nc	nc	27%	38%	nc	nc	nc	nc	nc
Field Blank	TB-S1 24-28/10/2022	-	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1
Field Rinsate	FR-SPT-S1 27/10/22	µg/L	<10	160	<100	<100	<1	<1	<1	<2	<1
Trip Spike	TS-S1 24-28/10/2022		-	-	-	-	101%	104%	97%	99%	98%

			Naphthalene	Acenaphthylene	Acenaph-thene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b,j+k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-c,d)pyrene	Dibenzo(a,h)anthra-cene	Benzo(g,h,i)perylene
	PQL Envirolab SYD		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.05	0.1	0.1	0.1
	PQL Envirolab VIC		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1
Intra laboratory duplicate	BH15	0-0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
	SDUP3	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Inter laboratory duplicate	BH20	0.05-0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
	SDUP2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Field Blank	TB-S1 24-28/10/2022	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
Field Rinsate	FR-SPT-S1 27/10/22	µg/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1
Trip Spike	TS-S1 24-28/10/2022		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

			HCB	alpha- BHC	gamma- BHC	beta- BHC	Heptachlor	delta- BHC	Aldrin	Heptachlor Epoxide	Gamma- Chlordane	alpha- chlordane	Endosulfan I	pp- DDE	Dieldrin	Endrin	pp- DDD	Endosulfan II	pp- DDT	Endrin Aldehyde	Endosulfan Sulphate	Methoxychlor
	PQL Envirolab SYD		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	PQL Envirolab VIC		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Intra laboratory duplicate	BH15	0-0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	SDUP3	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Inter laboratory duplicate	BH20	0.05-0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	SDUP2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Field Blank	TB-S1 24-28/10/2022	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Field Rinsate	FR-SPT-S1 27/10/22	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Trip Spike	TS-S1 24-28/10/2022		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

			Azinphos-methyl (Guthion)	Bromophos-ethyl	Chlorpyriphos	Chlorpyriphos-methyl	Diazinon	Dichlorvos	Dimethoate	Ethion	Fenitrothion	Malathion	Parathion	Ronnel	Total PCBS	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
	PQL Envirolab SYD		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	4	0.4	1	1	1	0.1	1	1
	PQL Envirolab VIC		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	4.0	0.4	1.0	1.0	1.0	0.1	1.0	1.0
Intra laboratory duplicate	BH15	0-0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	4	<0.4	28	15	15	<0.1	6	26
	SDUP3	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<4	<0.4	29	16	17	<0.1	7	28
	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	3	nc	28.5	15.5	16	nc	6.5	27
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	67%	nc	4%	6%	13%	nc	15%	7%
Inter laboratory duplicate	BH20	0.05-0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<4	<0.4	33	52	3	<0.1	6	12
	SDUP2	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<4	<0.4	24	46	2	<0.1	5	10
	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	28.5	49	2.5	nc	5.5	11
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	32%	12%	40%	nc	18%	18%
Field Blank	TB-S1 24-28/10/2022	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<4	<0.4	3	<1	2	<0.1	<1	2
Field Rinsate	FR-SPT-S1 27/10/22	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.05	<0.01	<0.01	<0.01	<0.03	<0.0005	<0.02	<0.02
Trip Spike	TS-S1 24-28/10/2022		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Result outside of QA/QC acceptance criteria (highlighted yellow)

ABBREVIATIONS AND EXPLANATIONS

Abbreviations used in the Tables:

ADWG: AustralianDrinking Water Guidelines
ANZG Australian and New Zealand Guidelines
B(a)P: Benzo(a)pyrene
CRC: Cooperative Research Centre
ESLs: Ecological Screening Levels
GIL: Groundwater Investigation Levels
HILs: Health Investigation Levels
HSLs: Health Screening Levels
HSL-SSA: Health Screening Level-SiteSpecific Assessment
NA: Not Analysed
NC: Not Calculated
NEPM: National Environmental Protection Measure
NHMRC: National Health and Medical Research Council
NL: Not Limiting
NSL: No Set Limit
OCP: Organochlorine Pesticides
OPP: Organophosphorus Pesticides
PAHs: Polycyclic Aromatic Hydrocarbons
ppm: Parts per million
PCBs: Polychlorinated Biphenyls
PCE: Perchloroethylene (Tetrachloroethylene or Tetrachloroethene)
PQL: Practical Quantitation Limit
RS: Rinsate Sample
RSL: Regional Screening Levels
SAC: Site Assessment Criteria
SSA: Site Specific Assessment
SSHSLs Site Specific Health Screening Levels
TB: Trip Blank
TCA: 1,1,1 Trichloroethane (methyl chloroform)
TCE: Trichloroethylene (Trichloroethene)
TS: Trip Spike
TRH: Total Recoverable Hydrocarbons
UCL: Upper Level Confidence Limit on Mean Value
USEPA United States Environmental Protection Agency
VOCC: Volatile Organic Chlorinated Compounds
WHO: World Health Organisation

TABLE G1
SUMMARY OF GROUNDWATER LABORATORY RESULTS COMPARED TO ECOLOGICAL GILs SAC
All results in µg/L unless stated otherwise.

	PQL Envirolab Services	ANZG 2018 Fresh Waters	SAMPLES						
			MW1	MW1 LAB DUP	MW12	MW15	WDUP1	WDUP2	WDUP2
Inorganic Compounds and Parameters									
pH		6.5 - 8.5	6.8	NA	7.1	6.4	NA	NA	NA
Electrical Conductivity (µS/cm)	1	NSL	**210**	NA	**1200**	**340**	NA	NA	NA
Metals and Metalloids									
Arsenic (As III)	1	24	<1	<1	<1	<1	<1	<1	NA
Cadmium	0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Chromium (SAC for Cr III adopted)	1	3.3	<1	<1	<1	<1	<1	<1	NA
Copper	1	1.4	<1	<1	<1	<1	<1	<1	NA
Lead	1	3.4	<1	<1	<1	<1	<1	<1	NA
Total Mercury (inorganic)	0.05	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	NA
Nickel	1	11	**2**	**2**	<1	**3**	**3**	**2**	NA
Zinc	1	8	**25**	**25**	**15**	**29**	**29**	**25**	NA
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)									
Benzene	1	950	<1	<1	<1	<1	<1	<1	<1
Toluene	1	180	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	1	80	<1	<1	<1	<1	<1	<1	<1
m+p-xylene	2	75	<2	<2	<2	<2	<2	<2	<2
o-xylene	1	350	<1	<1	<1	<1	<1	<1	<1
Total xylenes	2	NSL	<2	<2	<2	<2	<2	<2	<2
Volatile Organic Compounds (VOCs), including chlorinated VOCs									
Dichlorodifluoromethane	10	NSL	<10	<10	<10	<10	<10	<10	<10
Chloromethane	10	NSL	<10	<10	<10	<10	<10	<10	<10
Vinyl Chloride	10	100	<10	<10	<10	<10	<10	<10	<10
Bromomethane	10	NSL	<10	<10	<10	<10	<10	<10	<10
Chloroethane	10	NSL	<10	<10	<10	<10	<10	<10	<10
Trichlorofluoromethane	10	NSL	<10	<10	<10	<10	<10	<10	<10
1,1-Dichloroethene	1	700	<1	<1	<1	<1	<1	<1	<1
Trans-1,2-dichloroethene	1	NSL	<1	<1	<1	<1	<1	<1	<1
1,1-dichloroethane	1	90	<1	<1	<1	<1	<1	<1	<1
Cis-1,2-dichloroethene	1	NSL	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane	1	NSL	<1	<1	<1	<1	<1	<1	<1
Chloroform	1	370	**12**	**10**	<1	<1	<1	**11**	**12**
2,2-dichloropropane	1	NSL	<1	<1	<1	<1	<1	<1	<1
1,2-dichloroethane	1	1900	<1	<1	<1	<1	<1	<1	<1
1,1,1-trichloroethane	1	270	<1	<1	<1	<1	<1	<1	<1
1,1-dichloropropene	1	NSL	<1	<1	<1	<1	<1	<1	<1
Cyclohexane	1	NSL	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	1	240	<1	<1	<1	<1	<1	<1	<1
Benzene	1	950	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	1	NSL	<1	<1	<1	<1	<1	<1	<1
1,2-dichloropropane	1	900	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	1	330	<1	<1	<1	<1	<1	<1	<1
Bromodichloromethane	1	NSL	**3**	**2**	<1	<1	<1	**2**	**2**
trans-1,3-dichloropropene	1	NSL	<1	<1	<1	<1	<1	<1	<1
cis-1,3-dichloropropene	1	NSL	<1	<1	<1	<1	<1	<1	<1
1,1,2-trichloroethane	1	6500	<1	<1	<1	<1	<1	<1	<1
Toluene	1	180	<1	<1	<1	<1	<1	<1	<1
1,3-dichloropropane	1	1100	<1	<1	<1	<1	<1	<1	<1
Dibromochloromethane	1	NSL	<1	<1	<1	<1	<1	<1	<1
1,2-dibromoethane	1	NSL	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	1	70	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-tetrachloroethane	1	NSL	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	1	55	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	1	80	<1	<1	<1	<1	<1	<1	<1
Bromoform	1	NSL	<1	<1	<1	<1	<1	<1	<1
m+p-xylene	2	75	<2	<2	<2	<2	<2	<2	<2
Styrene	1	NSL	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-tetrachloroethane	1	400	<1	<1	<1	<1	<1	<1	<1
o-xylene	1	350	<1	<1	<1	<1	<1	<1	<1
1,2,3-trichloropropane	1	NSL	<1	<1	<1	<1	<1	<1	<1
Isopropylbenzene	1	30	<1	<1	<1	<1	<1	<1	<1
Bromobenzene	1	NSL	<1	<1	<1	<1	<1	<1	<1
n-propyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1
2-chlorotoluene	1	NSL	<1	<1	<1	<1	<1	<1	<1
4-chlorotoluene	1	NSL	<1	<1	<1	<1	<1	<1	<1
1,3,5-trimethyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1
Tert-butyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1
1,2,4-trimethyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1
1,3-dichlorobenzene	1	260	<1	<1	<1	<1	<1	<1	<1
Sec-butyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1
1,4-dichlorobenzene	1	60	<1	<1	<1	<1	<1	<1	<1
4-isopropyl toluene	1	NSL	<1	<1	<1	<1	<1	<1	<1
1,2-dichlorobenzene	1	160	<1	<1	<1	<1	<1	<1	<1
n-butyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1
1,2-dibromo-3-chloropropane	1	NSL	<1	<1	<1	<1	<1	<1	<1
1,2,4-trichlorobenzene	1	85	<1	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene	1	NSL	<1	<1	<1	<1	<1	<1	<1
1,2,3-trichlorobenzene	1	3	<1	<1	<1	<1	<1	<1	<1
Polycyclic Aromatic Hydrocarbons (PAHs)									
Naphthalene	0.2	16	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	NA
Acenaphthylene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Acenaphthene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Fluorene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Phenanthrene	0.1	0.6	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Anthracene	0.1	0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Fluoranthene	0.1	1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Pyrene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Benzo(a)anthracene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Chrysene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Benzo(b,j+k)fluoranthene	0.2	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	NA
Benzo(a)pyrene	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Indeno(1,2,3-c,d)pyrene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Dibenzo(a,h)anthracene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Benzo(g,h,i)perylene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA

Concentration above the SAC	**VALUE**
Concentration above the PQL	**Bold**
GIL >PQL	Red

TABLE G2
SUMMARY OF GROUNDWATER LABORATORY RESULTS COMPARED TO HUMAN CONTACT GILs
All results in µg/L unless stated otherwise.

	PQL Envirolab Services	Recreational (10 x NHMRC ADWG)	SAMPLES						
			MW1	MW1 LAB DUP	MW12	MW15	WDUP1	WDUP2	WDUP2
Inorganic Compounds and Parameters									
pH		6.5 - 8.5	6.8	NA	7.1	6.4	NA	NA	NA
Electrical Conductivity (µS/cm)	1	NSL	**210**	NA	**1200**	**340**	NA	NA	NA
Metals and Metalloids									
Arsenic (As III)	1	100	<1	<1	<1	<1	<1	<1	NA
Cadmium	0.1	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Chromium (total)	1	500	<1	<1	<1	<1	<1	<1	NA
Copper	1	20000	<1	<1	<1	<1	<1	<1	NA
Lead	1	100	<1	<1	<1	<1	<1	<1	NA
Total Mercury (inorganic)	0.05	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	NA
Nickel	1	200	**2**	**2**	<1	**3**	**3**	**2**	NA
Zinc	1	30000	**25**	**25**	**15**	**29**	**29**	**25**	NA
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)									
Benzene	1	10	<1	<1	<1	<1	<1	<1	<1
Toluene	1	8000	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	1	3000	<1	<1	<1	<1	<1	<1	<1
m+p-xylene	2	NSL	<2	<2	<2	<2	<2	<2	<2
o-xylene	1	NSL	<1	<1	<1	<1	<1	<1	<1
Total xylenes	2	6000	<2	<2	<2	<2	<2	<2	<2
Volatile Organic Compounds (VOCs), including chlorinated VOCs									
Dichlorodifluoromethane	10	NSL	<10	<10	<10	<10	<10	<10	<10
Chloromethane	10	NSL	<10	<10	<10	<10	<10	<10	<10
Vinyl Chloride	10	3	<10	<10	<10	<10	<10	<10	<10
Bromomethane	10	NSL	<10	<10	<10	<10	<10	<10	<10
Chloroethane	10	NSL	<10	<10	<10	<10	<10	<10	<10
Trichlorofluoromethane	10	NSL	<10	<10	<10	<10	<10	<10	<10
1,1-Dichloroethene	1	300	<1	<1	<1	<1	<1	<1	<1
Trans-1,2-dichloroethene	1	600	<1	<1	<1	<1	<1	<1	<1
1,1-dichloroethane	1	NSL	<1	<1	<1	<1	<1	<1	<1
Cis-1,2-dichloroethene	1	600	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane	1	2500	<1	<1	<1	<1	<1	<1	<1
Chloroform	1		**12**	**10**	<1	<1	<1	**11**	**12**
2,2-dichloropropane	1	NSL	<1	<1	<1	<1	<1	<1	<1
1,2-dichloroethane	1	30	<1	<1	<1	<1	<1	<1	<1
1,1,1-trichloroethane	1	NSL	<1	<1	<1	<1	<1	<1	<1
1,1-dichloropropene	1	NSL	<1	<1	<1	<1	<1	<1	<1
Cyclohexane	1	NSL	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	1	30	<1	<1	<1	<1	<1	<1	<1
Benzene	1	10	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	1	NSL	<1	<1	<1	<1	<1	<1	<1
1,2-dichloropropane	1	NSL	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	1	NSL	<1	<1	<1	<1	<1	<1	<1
Bromodichloromethane	1	NSL	**3**	**2**	<1	<1	<1	**2**	**2**
trans-1,3-dichloropropene	1	1000	<1	<1	<1	<1	<1	<1	<1
cis-1,3-dichloropropene	1	1000	<1	<1	<1	<1	<1	<1	<1
1,1,2-trichloroethane	1	NSL	<1	<1	<1	<1	<1	<1	<1
Toluene	1	8000	<1	<1	<1	<1	<1	<1	<1
1,3-dichloropropane	1	NSL	<1	<1	<1	<1	<1	<1	<1
Dibromochloromethane	1	NSL	<1	<1	<1	<1	<1	<1	<1
1,2-dibromoethane	1	NSL	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	1	500	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-tetrachloroethane	1	NSL	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	1	3000	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	1	3000	<1	<1	<1	<1	<1	<1	<1
Bromoform	1	NSL	<1	<1	<1	<1	<1	<1	<1
m+p-xylene	2	NSL	<2	<2	<2	<2	<2	<2	<2
Styrene	1	300	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-tetrachloroethane	1	NSL	<1	<1	<1	<1	<1	<1	<1
o-xylene	1	NSL	<1	<1	<1	<1	<1	<1	<1
1,2,3-trichloropropane	1	NSL	<1	<1	<1	<1	<1	<1	<1
Isopropylbenzene	1	NSL	<1	<1	<1	<1	<1	<1	<1
Bromobenzene	1	NSL	<1	<1	<1	<1	<1	<1	<1
n-propyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1
2-chlorotoluene	1	NSL	<1	<1	<1	<1	<1	<1	<1
4-chlorotoluene	1	NSL	<1	<1	<1	<1	<1	<1	<1
1,3,5-trimethyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1
Tert-butyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1
1,2,4-trimethyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1
1,3-dichlorobenzene	1	200	<1	<1	<1	<1	<1	<1	<1
Sec-butyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1
1,4-dichlorobenzene	1	400	<1	<1	<1	<1	<1	<1	<1
4-isopropyl toluene	1	NSL	<1	<1	<1	<1	<1	<1	<1
1,2-dichlorobenzene	1	15000	<1	<1	<1	<1	<1	<1	<1
n-butyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1
1,2-dibromo-3-chloropropane	1	NSL	<1	<1	<1	<1	<1	<1	<1
1,2,4-trichlorobenzene	1	300	<1	<1	<1	<1	<1	<1	<1
1,2,3-trichlorobenzene	1		<1	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene	1	7	<1	<1	<1	<1	<1	<1	<1
Polycyclic Aromatic Hydrocarbons (PAHs)									
Naphthalene	0.2	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	NA
Acenaphthylene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Acenaphthene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Fluorene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Phenanthrene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Anthracene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Fluoranthene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Pyrene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Benzo(a)anthracene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Chrysene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Benzo(b,j+k)fluoranthene	0.2	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	NA
Benzo(a)pyrene	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Indeno(1,2,3-c,d)pyrene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Dibenzo(a,h)anthracene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Benzo(g,h,i)perylene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA

Concentration above the SAC — **VALUE**
Concentration above the PQL — **Bold**
GIL >PQL — Red

TABLE G3
SUMMARY OF GROUNDWATER LABORATORY RESULTS COMPARED TO DRINKING WATER GILs
All results in µg/L unless stated otherwise.

	PQL Envirolab Services	NHMRC ADWG 2011	SAMPLES						
			MW1	MW1 LAB DUP	MW12	MW15	WDUP1	WDUP2	WDUP2
Inorganic Compounds and Parameters									
pH		6.5 - 8.5	6.8	NA	7.1	6.4	NA	NA	NA
Electrical Conductivity (µS/cm)	1	NSL	**210**	NA	**1200**	**340**	NA	NA	NA
Metals and Metalloids									
Arsenic (As III)	1	10	<1	<1	<1	<1	<1	<1	NA
Cadmium	0.1	2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Chromium (total)	1	50	<1	<1	<1	<1	<1	<1	NA
Copper	1	2000	<1	<1	<1	<1	<1	<1	NA
Lead	1	10	<1	<1	<1	<1	<1	<1	NA
Total Mercury (inorganic)	0.05	1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	NA
Nickel	1	20	**2**	**2**	<1	**3**	**3**	**2**	NA
Zinc	1	3000	**25**	**25**	**15**	**29**	**29**	**25**	NA
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)									
Benzene	1	1	<1	<1	<1	<1	<1	<1	<1
Toluene	1	800	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	1	300	<1	<1	<1	<1	<1	<1	<1
m+p-xylene	2	NSL	<2	<2	<2	<2	<2	<2	<2
o-xylene	1	NSL	<1	<1	<1	<1	<1	<1	<1
Total xylenes	2	600	<2	<2	<2	<2	<2	<2	<2
Volatile Organic Compounds (VOCs), including chlorinated VOCs									
Dichlorodifluoromethane	10	NSL	<10	<10	<10	<10	<10	<10	<10
Chloromethane	10	NSL	<10	<10	<10	<10	<10	<10	<10
Vinyl Chloride	10	0.3	<10	<10	<10	<10	<10	<10	<10
Bromomethane	10	NSL	<10	<10	<10	<10	<10	<10	<10
Chloroethane	10	NSL	<10	<10	<10	<10	<10	<10	<10
Trichlorofluoromethane	10	NSL	<10	<10	<10	<10	<10	<10	<10
1,1-Dichloroethene	1	30	<1	<1	<1	<1	<1	<1	<1
Trans-1,2-dichloroethene	1	60	<1	<1	<1	<1	<1	<1	<1
1,1-dichloroethane	1	NSL	<1	<1	<1	<1	<1	<1	<1
Cis-1,2-dichloroethene	1	60	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane	1	250	<1	<1	<1	<1	<1	<1	<1
Chloroform	1		**12**	**10**	<1	<1	<1	**11**	**12**
2,2-dichloropropane	1	NSL	<1	<1	<1	<1	<1	<1	<1
1,2-dichloroethane	1	3	<1	<1	<1	<1	<1	<1	<1
1,1,1-trichloroethane	1	NSL	<1	<1	<1	<1	<1	<1	<1
1,1-dichloropropene	1	NSL	<1	<1	<1	<1	<1	<1	<1
Cyclohexane	1	NSL	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	1	3	<1	<1	<1	<1	<1	<1	<1
Benzene	1	1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	1	NSL	<1	<1	<1	<1	<1	<1	<1
1,2-dichloropropane	2	NSL	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	1	NSL	<1	<1	<1	<1	<1	<1	<1
Bromodichloromethane	2	NSL	**3**	**2**	<1	<1	<1	**2**	**2**
trans-1,3-dichloropropene	1	100	<1	<1	<1	<1	<1	<1	<1
cis-1,3-dichloropropene	1	100	<1	<1	<1	<1	<1	<1	<1
1,1,2-trichloroethane	1	NSL	<1	<1	<1	<1	<1	<1	<1
Toluene	1	800	<1	<1	<1	<1	<1	<1	<1
1,3-dichloropropane	1	NSL	<1	<1	<1	<1	<1	<1	<1
Dibromochloromethane	1	NSL	<1	<1	<1	<1	<1	<1	<1
1,2-dibromoethane	1	NSL	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	1	50	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-tetrachloroethane	1	NSL	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	1	300	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	1	300	<1	<1	<1	<1	<1	<1	<1
Bromoform	1	NSL	<1	<1	<1	<1	<1	<1	<1
m+p-xylene	2	NSL	<2	<2	<2	<2	<2	<2	<2
Styrene	1	30	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-tetrachloroethane	1	NSL	<1	<1	<1	<1	<1	<1	<1
o-xylene	1	NSL	<1	<1	<1	<1	<1	<1	<1
1,2,3-trichloropropane	1	NSL	<1	<1	<1	<1	<1	<1	<1
Isopropylbenzene	1	NSL	<1	<1	<1	<1	<1	<1	<1
Bromobenzene	1	NSL	<1	<1	<1	<1	<1	<1	<1
n-propyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1
2-chlorotoluene	1	NSL	<1	<1	<1	<1	<1	<1	<1
4-chlorotoluene	1	NSL	<1	<1	<1	<1	<1	<1	<1
1,3,5-trimethyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1
Tert-butyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1
1,2,4-trimethyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1
1,3-dichlorobenzene	1	20	<1	<1	<1	<1	<1	<1	<1
Sec-butyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1
1,4-dichlorobenzene	1	40	<1	<1	<1	<1	<1	<1	<1
4-isopropyl toluene	1	NSL	<1	<1	<1	<1	<1	<1	<1
1,2-dichlorobenzene	1	1500	<1	<1	<1	<1	<1	<1	<1
n-butyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1
1,2-dibromo-3-chloropropane	1	NSL	<1	<1	<1	<1	<1	<1	<1
1,2,4-trichlorobenzene	1	30	<1	<1	<1	<1	<1	<1	<1
1,2,3-trichlorobenzene	1		<1	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene	1	0.7	<1	<1	<1	<1	<1	<1	<1
Polycyclic Aromatic Hydrocarbons (PAHs)									
Naphthalene	0.2	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	NA
Acenaphthylene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Acenaphthene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Fluorene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Phenanthrene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Anthracene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Fluoranthene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Pyrene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Benzo(a)anthracene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Chrysene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Benzo(b,j+k)fluoranthene	0.2	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	NA
Benzo(a)pyrene	0.1	0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Indeno(1,2,3-c,d)pyrene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Dibenzo(a,h)anthracene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Benzo(g,h,i)perylene	0.1	NSL	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA

Concentration above the SAC	**VALUE**
Concentration above the PQL	**Bold**
GIL >PQL	Red

TABLE G4
GROUNDWATER LABORATORY RESULTS COMPARED TO HSLs
All data in µg/L unless stated otherwise

				C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	PID
PQL - Envirolab Services				10	50	1	1	1	2	1	
NEPM 2013 - Land Use Category				**HSL-A/B: LOW/HIGH DENSITY RESIDENTIAL**							
Sample Reference	**Water Depth**	**Depth Category**	**Soil Category**								
MW1	4.38	4m to <8m	Sand	<10	**120**	<1	<1	<1	<2	<1	1
MW1	4.38	4m to <8m	Sand	<10	**120**	<1	<1	<1	<2	<1	1
MW12	3.43	2m to <4m	Sand	<10	<50	<1	<1	<1	<2	<1	0.5
MW15	0.81	0m to <2m	Sand	<10	<50	<1	<1	<1	<2	<1	0.5
WDUP1	0.81	0m to <2m	Sand	<10	<50	<1	<1	<1	<2	<1	NA
WDUP2	4.38	4m to <8m	Sand	**13**	**120**	<1	<1	<1	<2	<1	NA
WDUP2	4.38	4m to <8m	Sand	**16**	NA	<1	<1	<1	<2	<1	NA
Total Number of Samples				7	6	7	7	7	7	7	4
Maximum Value				16	120	<PQL	<PQL	<PQL	<PQL	<PQL	1

Concentration above the SAC — **VALUE**
Site specific assesment (SSA) required — **VALUE**
Concentration above the PQL — **Bold**
The guideline corresponding to the elevated value is highlighted in grey in the Groundwater Assessment Criteria Table below

HSL GROUNDWATER ASSESSMENT CRITERIA

Sample Reference	**Water Depth**	**Depth Category**	**Soil Category**	C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene
MW1	4.38	4m to <8m	Sand	1000	1000	800	NL	NL	NL	NL
MW1	4.38	4m to <8m	Sand	1000	1000	800	NL	NL	NL	NL
MW12	3.43	2m to <4m	Sand	1000	1000	800	NL	NL	NL	NL
MW15	0.81	0m to <2m	Sand	SSA	SSA	SSA	SSA	SSA	SSA	SSA
WDUP1	0.81	0m to <2m	Sand	SSA	SSA	SSA	SSA	SSA	SSA	SSA
WDUP2	4.38	4m to <8m	Sand	1000	1000	800	NL	NL	NL	NL
WDUP2	4.38	4m to <8m	Sand	1000	NA	800	NL	NL	NL	NL

TABLE G5
GROUNDWATER LABORATORY RESULTS COMPARED TO SITE SPECIFIC HSLs - RISK ASSESSMENT
All results in µg/L unless stated otherwise.

	PQL Envirolab Services	NHMRC ADWG 2011	WHO 2008	USEPA RSL Tapwater 2017	SAMPLES MW1	MW1 LAB DUP	MW12	MW15	WDUP1	WDUP2	WDUP2
Total Recoverable Hydrocarbons (TRH)											
C_6-C_9 Aliphatics (assessed using F1)	10	-	15000	-	<10	<10	<10	<10	<10	**13**	**16**
>C_9-C_{14} Aliphatics (assessed using F2)	50	-	100	-	**120**	**120**	<50	<50	<50	**120**	NA
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)											
Benzene	1	1	-	-	<1	<1	<1	<1	<1	<1	<1
Toluene	1	800	-	-	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	1	300	-	-	<1	<1	<1	<1	<1	<1	<1
Total xylenes	2	600	-	-	<2	<2	<2	<2	<2	<2	<2
Polycyclic Aromatic Hydrocarbons (PAHs)											
Naphthalene	1	-	-	6.1	<1	<1	<1	<1	<1	<1	<1
Volatile Organic Compounds (VOCs), including chlorinated VOCs											
Dichlorodifluoromethane	10	-	-	-	<10	<10	<10	<10	<10	<10	<10
Chloromethane	10	-	-	-	<10	<10	<10	<10	<10	<10	<10
Vinyl Chloride	10	0.3	-	-	<10	<10	<10	<10	<10	<10	<10
Bromomethane	10	-	-	-	<10	<10	<10	<10	<10	<10	<10
Chloroethane	10	-	-	-	<10	<10	<10	<10	<10	<10	<10
Trichlorofluoromethane	10	-	-	-	<10	<10	<10	<10	<10	<10	<10
1,1-Dichloroethene	1	30	-	-	<1	<1	<1	<1	<1	<1	<1
Trans-1,2-dichloroethene	1	60	-	-	<1	<1	<1	<1	<1	<1	<1
1,1-dichloroethane	1	-	-	-	<1	<1	<1	<1	<1	<1	<1
Cis-1,2-dichloroethene	1	60	-	-	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane	1	250	-	-	<1	<1	<1	<1	<1	<1	<1
Chloroform	1		-	-	**12**	**10**	<1	<1	<1	**11**	**12**
2,2-dichloropropane	1	-	-	-	<1	<1	<1	<1	<1	<1	<1
1,2-dichloroethane	1	3	-	-	<1	<1	<1	<1	<1	<1	<1
1,1,1-trichloroethane	1	-	-	-	<1	<1	<1	<1	<1	<1	<1
1,1-dichloropropene	1	-	-	-	<1	<1	<1	<1	<1	<1	<1
Cyclohexane	1	-	-	-	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	1	3	-	-	<1	<1	<1	<1	<1	<1	<1
Benzene	1	1	-	-	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	1	-	-	-	<1	<1	<1	<1	<1	<1	<1
1,2-dichloropropane	1	-	-	-	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	1	-	-	-	<1	<1	<1	<1	<1	<1	<1
Bromodichloromethane	1	-	-	-	**3**	**2**	<1	<1	<1	**2**	**2**
trans-1,3-dichloropropene	1	100	-	-	<1	<1	<1	<1	<1	<1	<1
cis-1,3-dichloropropene	1	100	-	-	<1	<1	<1	<1	<1	<1	<1
1,1,2-trichloroethane	1	-	-	-	<1	<1	<1	<1	<1	<1	<1
Toluene	1	800	-	-	<1	<1	<1	<1	<1	<1	<1
1,3-dichloropropane	1	-	-	-	<1	<1	<1	<1	<1	<1	<1
Dibromochloromethane	1	-	-	-	<1	<1	<1	<1	<1	<1	<1
1,2-dibromoethane	1	-	-	-	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	1	50	-	-	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-tetrachloroethane	1	-	-	-	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	1	300	-	-	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	1	300	-	-	<1	<1	<1	<1	<1	<1	<1
Bromoform	1	-	-	-	<1	<1	<1	<1	<1	<1	<1
m+p-xylene	2	-	-	-	<2	<2	<2	<2	<2	<2	<2
Styrene	1	30	-	-	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-tetrachloroethane	1	-	-	-	<1	<1	<1	<1	<1	<1	<1
o-xylene	1	-	-	-	<1	<1	<1	<1	<1	<1	<1
1,2,3-trichloropropane	1	-	-	-	<1	<1	<1	<1	<1	<1	<1
Isopropylbenzene	1	-	-	-	<1	<1	<1	<1	<1	<1	<1
Bromobenzene	1	-	-	-	<1	<1	<1	<1	<1	<1	<1
n-propyl benzene	1	-	-	-	<1	<1	<1	<1	<1	<1	<1
2-chlorotoluene	1	-	-	-	<1	<1	<1	<1	<1	<1	<1
4-chlorotoluene	1	-	-	-	<1	<1	<1	<1	<1	<1	<1
1,3,5-trimethyl benzene	1	-	-	-	<1	<1	<1	<1	<1	<1	<1
Tert-butyl benzene	1	-	-	-	<1	<1	<1	<1	<1	<1	<1
1,2,4-trimethyl benzene	1	-	-	-	<1	<1	<1	<1	<1	<1	<1
1,3-dichlorobenzene	1	20	-	-	<1	<1	<1	<1	<1	<1	<1
Sec-butyl benzene	1	-	-	-	<1	<1	<1	<1	<1	<1	<1
1,4-dichlorobenzene	1	40	-	-	<1	<1	<1	<1	<1	<1	<1
4-isopropyl toluene	1	-	-	-	<1	<1	<1	<1	<1	<1	<1
1,2-dichlorobenzene	1	1500	-	-	<1	<1	<1	<1	<1	<1	<1
n-butyl benzene	1	-	-	-	<1	<1	<1	<1	<1	<1	<1
1,2-dibromo-3-chloropropane	1	-	-	-	<1	<1	<1	<1	<1	<1	<1
1,2,4-trichlorobenzene	1	30	-	-	<1	<1	<1	<1	<1	<1	<1
1,2,3-trichlorobenzene	1		-	-	<1	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene	1	7	-	-	<1	<1	<1	<1	<1	<1	<1

Concentration above the SAC — **VALUE**
Concentration above the PQL — **Bold**
GIL >PQL — Red

TABLE Q2
GROUNDWATER QA/QC SUMMARY

		Dichlorodifluoromethane	Chloromethane	Vinyl Chloride	Bromomethane	Chloroethane	Trichlorofluoromethane	1,1-Dichloroethene	Trans-1,2-dichloroethene	1,1-dichloroethane	Cis-1,2-dichloroethene	Bromochloromethane	Chloroform	2,2-dichloropropane	1,2-dichloroethane	1,1,1-trichloroethane	1,1-dichloropropene	Cyclohexane	Carbon tetrachloride	Benzene	Dibromomethane	1,2-dichloropropane	Trichloroethene	Bromodichloromethane	trans-1,3-dichloropropene	cis-1,3-dichloropropene	1,1,2-trichloroethane	Toluene	1,3-dichloropropane	Dibromochloromethane
	PQL Envirolab SYD	*10*	*10*	*10*	*10*	*10*	*10*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
	PQL Envirolab VIC	*10*	*10*	*10*	*10*	*10*	*10*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Intra	MW15	<10	<10	<10	<10	<10	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
laboratory	WDUP1	<10	<10	<10	<10	<10	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
duplicate	MEAN	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Inter	MW1	<10	<10	<10	<10	<10	<10	<1	<1	<1	<1	<1	12	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	3	<1	<1	<1	<1	<1	<1
laboratory	WDUP2	<10	<10	<10	<10	<10	<10	<1	<1	<1	<1	<1	11	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	2	<1	<1	<1	<1	<1	<1
duplicate	MEAN	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	11.5	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	2.5	nc	nc	nc	nc	nc	nc
	RPD %	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	9%	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	40%	nc	nc	nc	nc	nc	nc

		1,2-dibromoethane	Tetrachloroethene	1,1,1,2-tetrachloroethane	Chlorobenzene	Ethylbenzene	Bromoform	m+p-xylene	Styrene	1,1,2,2-tetrachloroethane	o-xylene	1,2,3-trichloropropane	Isopropylbenzene	Bromobenzene	n-propyl benzene	2-chlorotoluene	4-chlorotoluene	1,3,5-trimethyl benzene	Tert-butyl benzene	1,2,4-trimethyl benzene	1,3-dichlorobenzene	Sec-butyl benzene	1,4-dichlorobenzene	4-isopropyl toluene	1,2-dichlorobenzene	n-butyl benzene	1,2-dibromo-3-chloropropane	1,2,4-trichlorobenzene	Hexachlorobutadiene	1,2,3-trichlorobenzene
	PQL Envirolab SYD	*1*	*1*	*1*	*1*	*1*	*1*	*2*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
	PQL Envirolab VIC	*1*	*1*	*1*	*1*	*1*	*1*	*2*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Intra	MW15	<1	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
laboratory	WDUP1	<1	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
duplicate	MEAN	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Inter	MW1	<1	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
laboratory	WDUP2	<1	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
duplicate	MEAN	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc

		TRH C6 - C10	TRH >C10-C16	TRH >C16-C34	TRH >C34-C40	Benzene	Toluene	Ethylbenzene	m+p-xylene	o-Xylene	Naphthalene	Acenaphthylene	Acenaph-thene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b,j+k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-c,d)pyrene	Dibenzo(a,h)anthra-cene	Benzo(g,h,i)perylene	Arsenic	Cadmium	Chromium VI	Copper	Lead	Mercury	Nickel	Zinc
	PQL Envirolab SYD	*10*	*50*	*100*	*100*	*1*	*1*	*1*	*2*	*1*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*1*	*0.1*	*1*	*1*	*1*	*0.05*	*1*	*1*
	PQL Envirolab VIC	*10*	*50*	*100*	*100*	*1.0*	*1.0*	*1.0*	*2.0*	*1.0*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*1*	*0.1*	*1*	*1*	*1*	*0.05*	*1*	*1*
Intra	MW15	<10	<50	<100	<100	<1	<1	<1	<2	<1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<1	<1	<1	<0.05	3	29
laboratory	WDUP1	<10	<50	<100	<100	<1	<1	<1	<2	<1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<1	<1	<1	<0.05	3	29
duplicate	MEAN	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	3	29
	RPD %	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	0%	0%
Inter	MW1	<10	120	<100	<100	<1	<1	<1	<2	<1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<1	<1	<1	<0.05	2	25
laboratory	WDUP2	13	120	<100	<100	<1	<1	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<1	<1	<1	<0.05	2	25
duplicate	MEAN	9	120	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	2	25
	RPD %	89%	0%	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	0%	0%
Field	TB-W1	-	-	-	-	<1	<1	<1	<2	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Blank	28/10/2022																																
Trip	TS-W1	-	-	-	-	99%	111%	114%	110%	111%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Spike	28/10/2022																																

Result outside of QA/QC acceptance criteria — Value

Appendix C: Borehole Logs

JKGeotechnics

BOREHOLE LOG

Borehole No. 1 1/1

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: 35521LF **Method:** SPIRAL AUGER **R.L. Surface:** 873.70m

Date: 25/10/22 **Datum:** AHD

Plant Type: JK400 **Logged/Checked by:** C.S.Y./O.F.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION						0		-	ASPHALTIC CONCRETE: 50mm.t				
									FILL: Clayey sand, fine to medium grained, brown, with fine to coarse grained igneous gravel, brick fragments and slag.	M			APPEARS WELL COMPACTED
					N = 11 6,6,5					M			SCREEN: 10.87kg 0.05-0.5m NO FCF
						1		CL	FILL: Gravelly clayey sand, fine to medium grained, brown, low to medium plasticity, with fine to coarse grained igneous gravel and ash.	w>PL	VSt		SCREEN: 2.45kg 0.5-1.0m NO FCF
					N > 19 6,8, 11/100mm				Silty CLAY: low plasticity, light grey mottled orange brown and dark grey, trace of fine to medium grained ironstone gravel.			350 320 380	RESIDUAL
					REFUSAL	2							
					N = 16 7,8,8	3						280 350 320	
1 DAY AFTER PUMP OUT						4				w<PL	Hd		VERY LOW 'TC' BIT RESISTANCE
AFTER 1 DAY OF DRILLING					N > 22 7,14, 8/100mm							600 600 600	GROUNDWATER MONITORING WELL INSTALLED TO 6.0m. CLASS 18 MACHINE SLOTTED / HAND SLOTTED 50mm DIA. PVC STANDPIPE 6.0m TO 2.0m. CASING 2.0m TO 0.1m. 2mm SAND FILTER PACK 6.0m TO 1.45m. BENTONITE SEAL 1.45m TO 0.85m. BACKFILLED WITH SAND AND CUTTINGS TO THE SURFACE. COMPLETED WITH A CONCRETED GATIC COVER.
					REFUSAL	5							
					N = 28 7,13,15	6						600 600 600	
									END OF BOREHOLE AT 6.45m				
						7							

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BOREHOLE LOG

Borehole No. 2
1/1

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: 35521LF **Method:** HAND AUGER **R.L. Surface:** 872.98m

Date: 24/10/22 **Datum:** AHD

Plant Type: - **Logged/Checked by:** C.S.Y./O.F.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
					REFER TO DCP TEST RESULTS SHEET	0			FILL: Silty clay, medium plasticity, brown, trace of fine to coarse grained igneous and ironstone gravel, root fibres, glass and concrete rubbles.	w<PL			APPEARS POORLY TO MODERATELY COMPACTED
								ML	Clayey SILT: low plasticity, brown mottled orange brown, trace of fine grained igneous gravel and ash.	w>PL	S-F	30 30 20	SCREEN: 12.6kg 0-0.1m NO FCF
						1		CL-CI	Silty CLAY: low to medium plasticity, light grey mottled orange brown and dark brown, trace of fine to coarse grained igneous gravel and ash.	w>PL	F	50 50 50	SCREEN: 2.45kg 0.1-0.4m NO FCF
											VSt-Hd		RESIDUAL
									END OF BOREHOLE AT 1.5m				HP TESTING ON REMOULDED SAMPLES
						2							HAND AUGER REFUSAL ON CLAY
						3							
						4							
						5							
						6							
						7							

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BOREHOLE LOG

Borehole No. 3 1/1

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: 35521LF **Method:** HAND AUGER **R.L. Surface:** 873.63m

Date: 24/10/22 **Datum:** AHD

Plant Type: - **Logged/Checked by:** C.S.Y./O.F.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	■			■	REFER TO DCP TEST RESULTS SHEET	0			FILL: Silty clay, medium plasticity, dark brown, trace of root fibres and ash.	w≈PL			APPEARS MODERATELY COMPACTED
	■			■						w≈PL			SCREEN: 10.47kg 0.1-0.4m NO FCF
	■			■					FILL: Silty clay, medium to high plasticity, brown and red brown, trace of fine to coarse grained slag and igneous gravel.	w<PL			
	■			■				ML		w>PL	F		
	■			■		1			FILL: Silty clay, medium plasticity, dark brown, trace of brick fragments and igneous gravel.				SCREEN: 3.40kg 0.1-0.4m NO FCF
	■			■								80 90 100	
	■							CL-CI	Clayey SILT: low plasticity, brown mottled orange brown, trace of ash.	w>PL	F-St		RESIDUAL
										w>PL	VSt-Hd		
									Silty CLAY: low to medium plasticity, dark brown mottled red brown, trace of ash and fine to medium grained ironstone gravel.				HAND AUGER REFUSAL ON IRONSTONE/ STIFF CLAY
						2			Silty CLAY: low to medium plasticity, light grey mottled orange brown, trace of ash and fine to medium grained igneous and ironstone gravel.				
									END OF BOREHOLE AT 1.6m				
						3							
						4							
						5							
						6							
						7							

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BOREHOLE LOG

Borehole No. 4 1/1

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: 35521LF **Method:** HAND AUGER **R.L. Surface:** 872.42m

Date: 25/10/22 **Datum:** AHD

Plant Type: - **Logged/Checked by:** C.S.Y./O.F.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
					REFER TO DCP TEST RESULTS SHEET	0		ML	Clayey SILT: low plasticity, dark brown and orange brown, trace of ash and root fibres.	w>PL			GRASS COVER
								CL	Silty CLAY: low plasticity, light grey mottled orange brown, trace of fine to medium grained ironstone gravel.	w>PL	(S-F)		RESIDUAL SCREEN: 10.30kg 0-0.1m NO FCF
						1					(St-VSt)		
											(Hd)		
									END OF BOREHOLE AT 1.4m				HAND AUGER REFUSAL ON IRONSTONE GRAVEL
						2							
						3							
						4							
						5							
						6							
						7							

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BOREHOLE LOG

Borehole No. 5 1/1

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: 35521LF **Method:** HAND AUGER **R.L. Surface:** 872.92m

Date: 24/10/22 **Datum:** AHD

Plant Type: - **Logged/Checked by:** C.S.Y./O.F.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	■				REFER TO DCP TEST RESULTS SHEET	0			FILL: Silty clay, medium plasticity, dark brown, trace of root fibres, slag and brick fragments and ash.	w>PL			GRASS COVER
				■				ML		w>PL			APPEARS POORLY COMPACTED
	■							CI	Clayey SILT: low to medium plasticity, grey, trace of root fibres, ash and fine to medium grained ironstone gravel.	w>PL	(F- St)		SCREEN: 10.53kg 0-0.1m NO FCF
				■		1			Silty CLAY: medium plasticity, brown mottled grey, with fine to medium grained ironstone gravel, trace of root fibres and ash.				SCREEN: 5.87kg 0.1-0.3m NO FCF
											VSt		RESIDUAL
									END OF BOREHOLE AT 1.5m				HAND AUGER REFUSAL ON IRONSTONE GRAVEL
						2							
						3							
						4							
						5							
						6							
						7							

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BOREHOLE LOG

Borehole No. 6 1/1

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: 35521LF **Method:** HAND AUGER **R.L. Surface:** 873.60m

Date: 26/10/22 **Datum:** AHD

Plant Type: - **Logged/Checked by:** C.S.Y./O.F.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	■			■	REFER TO DCP TEST RESULTS SHEET	0			FILL: Silty clay, medium plasticity, brown, trace of fine to medium grained igneous gravel and slag.	w>PL			GRASS COVER APPEARS POORLY COMPACTED
	■			■		1		CL-CI	Silty CLAY: low to medium plasticity, light grey mottled orange brown, trace of fine to medium grained ironstone gravel and ash.	w>PL	(S-F)		SCREEN: 12.05kg 0-0.1m NO FCF RESIDUAL
	■			■		2					(St-VSt)		
									END OF BOREHOLE AT 2.2m				HAND AUGER REFUSAL ON IRONSTONE GRAVEL
						3							
						4							
						5							
						6							
						7							

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BOREHOLE LOG

Borehole No. 7 1/1

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: 35521LF **Method:** HAND AUGER **R.L. Surface:** 872.65m

Date: 26/10/22 **Datum:** AHD

Plant Type: - **Logged/Checked by:** C.S.Y./O.F.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	■				REFER TO DCP TEST RESULTS SHEET	0			FILL: Clayey silt, low plasticity, dark brown, trace of root fibres and ash.	w>PL			GRASS COVER
								CL	Silty CLAY: low plasticity, light grey mottled orange brown.	w>PL	(VS)		SCREEN: 11.98kg 0-0.2m NO FCF
						1				w≈PL	(St-VSt) (Hd)		RESIDUAL
									END OF BOREHOLE AT 1.6m				HAND AUGER REFUSAL ON HARD CLAY
						2							
						3							
						4							
						5							
						6							
						7							

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BOREHOLE LOG

Borehole No. 8
1/1

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: 35521LF **Method:** HAND AUGER **R.L. Surface:** 873.87m

Date: 27/10/22 **Datum:** AHD

Plant Type: - **Logged/Checked by:** C.S.Y./O.F.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	■			■	REFER TO DCP TEST RESULTS SHEET	0		CL	FILL: Clayey silt, low plasticity, dark brown, trace of steel parts, root fibres and fine to coarse grained igneous gravel.	w>PL w≈PL	(S-F)		GRASS COVER SCREEN: 11.30kg 0-0.1m NO FCF 10L BUCKET
	■			■					Silty CLAY: low plasticity, brown, trace of fine to medium grained ironstone gravel and ash.	w>PL	(St-VSt)		RESIDUAL
				■		1		CI	Silty CLAY: medium plasticity, light grey mottled orange brown, trace of root fibres.	w≈PL			
				■					END OF BOREHOLE AT 1.8m				HAND AUGER REFUSAL ON STIFF CLAY
						2							
						3							
						4							
						5							
						6							
						7							

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BOREHOLE LOG

Borehole No. 9 1/1

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: 35521LF **Method:** HAND AUGER **R.L. Surface:** 873.86m

Date: 28/10/22 **Datum:** AHD

Plant Type: - **Logged/Checked by:** C.S.Y./O.F.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLET-ION	■		■	■	REFER TO DCP TEST RESULTS SHEET	0		CL	FILL: Clayey silt, dark brown, trace of root fibres.	w>PL	(S-F)		GRASS COVER
									Silty CLAY: low plasticity, red brown and brown, trace of root fibres and ash.	w>PL			SCREEN: 7.90kg 0-0.1m NO FCF 8L BUCKET
	■			■		1		CL-CI	Silty CLAY: low to medium plasticity, light grey mottled orange brown, trace of ash and fine to medium grained igneous gravel.	w≈PL	(VSt -Hd)		RESIDUAL
						2			END OF BOREHOLE AT 1.65m				HAND AUGER REFUSAL ON GRAVEL
						3							
						4							
						5							
						6							
						7							

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BOREHOLE LOG

Borehole No. 10
1/1

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: 35521LF **Method:** HAND AUGER **R.L. Surface:** 874.43m

Date: 28/10/22 **Datum:** AHD

Plant Type: - **Logged/Checked by:** C.S.Y./O.F.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION	■			■	REFER TO DCP TEST RESULTS SHEET	0			FILL: Silty clay, medium plasticity, brown, with fine to coarse grained igneous and ironstone gravel, brick fragments, root fibres, ash, fine grained igneous cobbles and slag.	w>PL			GRASS COVER APPEARS POORLY COMPACTED SCREEN: 11.10kg 0-0.2m NO FCF 10L BUCKET SCREEN: 11.05kg 0.2-0.6m NO FCF
									END OF BOREHOLE AT 0.6m				HAND AUGER REFUSAL ON COBBLE IN FILL
						1							
						2							
						3							
						4							
						5							
						6							
						7							

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BOREHOLE LOG

Borehole No. **11** 1/1

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: 35521LF **Method:** SPIRAL AUGER **R.L. Surface:** 874.53m

Date: 27/10/22 **Datum:** AHD

Plant Type: JK400 **Logged/Checked by:** C.S.Y./O.F.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION						0		-	ASPHALTIC CONCRETE: 50mm.t FILL: Sand, fine to medium grained, light brown, with silt and fine to medium grained sandstone gravel and slag.	M			SCREEN: 9.55kg 0.05-1.0m NO FCF
						1		CL	Silty CLAY: low plasticity, light grey mottled orange brown and red brown, with fine to medium grained ironstone gravel and ash.	w≈PL	VSt-Hd		SCREEN: 1.72kg 1.0-1.2m NO FCF RESIDUAL
					N = 15 3,7,8	2						380 430 510	
					N = 10 5,5,5	3						300 400 450	
					N = 11 5,5,6	4		CI	Silty CLAY: medium plasticity, brown mottled orange brown and dark grey, trace of fine grained ironstone gravel.			300 350 380	
					N = 12 4,5,7	5						300 320 350	
						6			END OF BOREHOLE AT 6.45m				
						7							

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BOREHOLE LOG

Borehole No. **12** 1/1

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: 35521LF **Method:** SPIRAL AUGER **R.L. Surface:** 875.46m

Date: 26/10/22 **Datum:** AHD

Plant Type: JK400 **Logged/Checked by:** C.S.Y./O.F.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLET-ION						0			FILL: Clayey silt, low plasticity, dark brown, trace of root fibres and fine to coarse grained igneous gravel.	w>PL			GRASS COVER
								CL	Silty CLAY: low plasticity, brown mottled grey, trace of fine to medium grained ironstone gravel and ash.	w>PL	(F- St)		SCREEN: 10.45kg 0-0.1m NO FCF
					N = 6 3,2,4	1							1 MORE SAMPLE 0.8-1.0m RESIDUAL
					N = 13 3,5,8			CI	Silty CLAY: medium plasticity, light grey mottled orange brown and dark grey, trace of fine to medium grained ironstone gravel and ash.	w>PL	Hd	430 500 520	
					N = 22 6,10,12	2							
▼ 1 DAY AFTER PUMP OUT						3						550 550 500	
									as above, but without ash.				GROUNDWATER MONITORING WELL INSTALLED TO 6.0m. CLASS 18 MACHINE SLOTTED PVC. STANDPIPE 6.0m TO 2.0m. CASING 2.0m TO 0.13m. 2mm SAND FILTER PACK 6.0m TO 1.1m. BENTONITE SEAL 1.1m TO 0.3m. BACKFILLED WITH SAND TO THE SURFACE. COMPLETED WITH A CONCRETE GATIC COVER.
					N = 22 8,10,12	4						500 550 570	
						5			as above, but with ash.				
					N = 17 6,9,8	6						400 450 500	
						7			END OF BOREHOLE AT 6.45m				

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BOREHOLE LOG

Borehole No. 13 1/1

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: 35521LF **Method:** SPIRAL AUGER **R.L. Surface:** 874.40m

Date: 27/10/22 **Datum:** AHD

Plant Type: JK400 **Logged/Checked by:** C.S.Y./O.F.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION	■					0		-	ASPHALTIC CONCRETE: 50mm.t	M			SCREEN: 4.45kg 0.05-0.5m NO FCF 4L BUCKET
	■				N = 19 9,8,11			CI	FILL: Sand, fine to medium grained, light brown, with silt and fine to coarse grained sandstone and igneous gravel.	w>PL	Hd		RESIDUAL
				■		1			Silty CLAY: medium plasticity, light grey mottled orange brown and red brown, trace of fine to medium grained ironstone gravel and ash.			>600 >600 >600	
	■				N = 20 8,10,10							450 480 400	
				■		2				w≈PL			
				■	N = 13 6,6,7	3						500 450 470	
				■		4			Silty CLAY: medium plasticity, light grey mottled orange brown, trace of fine to medium grained ironstone gravel, root fibres and ash.	w>PL	VSt		
				■	N = 13 5,7,6							350 300 320	SLIGHT ORGANIC ODOUR
				■		5							
				■	N = 8 4,4,4	6						230 250 300	
						7			END OF BOREHOLE AT 6.45m				

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BOREHOLE LOG

Borehole No. **14** 1/1

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: 35521LF **Method:** SPIRAL AUGER **R.L. Surface:** 875.15m

Date: 26/10/22 **Datum:** AHD

Plant Type: JK400 **Logged/Checked by:** C.S.Y./O.F.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLET-ION						0			FILL: Clayey silt, low plasticity, dark brown, trace of root fibres, fine to coarse graiend igneous gravel, slag and coal.	w>PL			GRASS COVER SCREEN: 11.28kg 0-0.1m NO FCF
					N = 14 2,6,8			CL-CI	Silty CLAY: low to medium plasticity, light grey mottled orange brown and red brown, trace of ash and fine to medium grained ironstone gravel.	w>PL	VSt-Hd	350 400 450	SCREEN: 3.80kg 0.1-0.5m NO FCF RESIDUAL
						1				w≈PL	Hd		
					N = 25 8,13,12							>600 >600 >600	
▼ 1 DAY AFTER PUMP OUT						2							
					N = 17 5,7,10	3			as above, but without ash.			450 500 520	SPT WENT MORE THAN 0.45m GROUNDWATER MONITORING WELL INSTALLED TO 6.0m. CLASS 18 MACHINE SLOTTED PVC. STANDPIPE 6.0m TO 2.0m. CASING 2.0m TO 0m. 2mm SAND FILTER PACK 6.0m TO 1.5m. BENTONITE SEAL 1.5m TO 0.9m. BACKFILLED WITH SAND TO THE SURFACE. COMPLETED WITH A CONCRETE GATIC COVER.
						4							
					N = 16 6,8,8							540 550 580	
						5							
					N = 18 7,11,7	6						500 570 530	
									END OF BOREHOLE AT 6.45m				
						7							

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BOREHOLE LOG

Borehole No. **15** 1/1

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: 35521LF **Method:** SPIRAL AUGER **R.L. Surface:** 876.22m

Date: 26/10/22 **Datum:** AHD

Plant Type: JK400 **Logged/Checked by:** C.S.Y./O.F.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION						0			FILL: Clayey silt, low plasticity, grey, trace of root fibres, brick and tile fragments.	w>PL			GRASS COVER
								CL	Silty CLAY: low plasticity, light grey mottled orange brown, trace of fine to medium grained ironstone gravel.	w>PL	(S-F)		SCREEN: 10.90kg 0-0.1m NO FCF
					N = SPT SUNK 200mm								SCREEN: 2.45kg 0.1-0.3m NO FCF
▼ 1 DAY AFTER PUMP OUT						1							RESIDUAL
										w≈PL	Hd		
					N > 18 13,18/ 150mm REFUSAL			CI	Silty CLAY: medium plasticity, orange brown mottled light grey and dark grey, trace of fine to medium grained ironstone gravel and ash.	w<PL	Hd	450 500 500	
						2							
					N > 22 8,13,9/ 50mm REFUSAL	3							GROUNDWATER MONITORING WELL INSTALLED TO 6.0m. CLASS 18 MACHINE SLOTTED PVC. STANDPIPE 3.75m TO 0.75m. CASING 0.75m TO 0.2m. 2mm SAND FILTER PACK 6.0m TO 0.5m. BENTONITE SEAL 0.5m TO 0.3m. BACKFILLED WITH SAND TO THE SURFACE. COMPLETED WITH A CONCRETE GATIC COVER.
						4							
								ML	Clayey SILT: low plasticity, red brown mottled orange brown.	w<PL	Hd	430 420 450	
					N = 18 7,8,10	5							
					N = 27 9,12,15	6							
									END OF BOREHOLE AT 6.45m				
						7							

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BOREHOLE LOG

Borehole No. 16 1/1

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: 35521LF **Method:** SPIRAL AUGER **R.L. Surface:** 874.46m

Date: 27/10/22 **Datum:** AHD

Plant Type: JK400 **Logged/Checked by:** C.S.Y./O.F.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION	■			■		0		-	ASPHALTIC CONCRETE: 50mm.t	M			SCREEN: 5.40kg 0.05-0.3m NO FCF 5L BUCKET
				■					FILL: Sand, fine to medium grained, light grey, with silt, fine to medium grained sandstone gravel and slag.				
	■		■	■	N = 22 7,10,12			Cl	Silty CLAY: medium plasticity, light grey mottled orange brown and red brown, trace of fine to medium grained ironstone gravel.	w≈PL	Hd	550 >600 >600	RESIDUAL
			■			1							
			■	■	N = 18 7,8,10							450 450 480	
						2							
				■	N = 25 6,12,13	3					VSt	380 350 320	
									as above, but with fine to medium grained igneous gravel and ash.	w>PL			
				■	N = 11 6,5,6	4						250 310 350	
						5							
				■	N = 18 6,8,10	6					VSt-Hd	360 380 430	
									END OF BOREHOLE AT 6.45m				
						7							

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BOREHOLE LOG

Borehole No. 17 1/1

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: 35521LF **Method:** SPIRAL AUGER **R.L. Surface:** 874.35m

Date: 25/10/22 **Datum:** AHD

Plant Type: JK400 **Logged/Checked by:** C.S.Y./O.F.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
						0		-	ASPHALTIC CONCRETE: 50mm.t				SCREEN: 6.79kg 0.05-0.4m NO FCF
								-	FILL: Clayey sand, fine to medium grained, red brown, low plasticity,	M			
					N = 21 6,10,11			CI	trace of fine to medium grained igneous gravel.	w≈PL	Hd		RESIDUAL
						1			Silty CLAY: medium plasticity, light grey mottled orange brown, trace of fine to medium grained ironstone gravel.			500 550 600	GROUNDWATER MONITORING WELL INSTALLED TO 5.95m. CLASS 18 MACHINE SLOTTED PVC. STANDPIPE 5.95m TO 1.95m. CASING 1.95m TO 0.12m. 2mm SAND FILTER PACK 6.0m TO 1.4m. BENTONITE SEAL 1.4m TO 0. 55m. BACKFILLED WITH SAND TO THE SURFACE. COMPLETED WITH A CONCRETE GATIC COVER.
					N = 25 10,12,13				as above, but brown mottled red brown.	w≈PL	Hd	450 500 550	
						2							
									Clayey SILT or Silty CLAY: medium plasticity, light brown mottled orange brown, trace of fine grained ironstone gravel, ash and root fibres.	w≈PL	VSt		
▶					N = 9 2,4,5	3				w>PL		250 320 280	
						4							
					N = 10 4,5,5							200 230 250	
						5							
					N = 17 6,8,9	6							
						7			END OF BOREHOLE AT 6.45m				

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BOREHOLE LOG

Borehole No. **18** 1/1

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: 35521LF **Method:** SPIRAL AUGER **R.L. Surface:** 874.26m

Date: 25/10/22 **Datum:** AHD

Plant Type: JK400 **Logged/Checked by:** C.S.Y./O.F.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION						0		-	ASPHALTIC CONCRETE: 50mm.t				
									FILL: Sand, fine to medium grained, light grey, with silt and fine to medium grained sandstone gravel.	M			SCREEN: 2.50kg 0.05-0.3m NO FCF 8L BUCKET
										w≈PL			
					N > 20 10,14, 6/50mm				FILL: Silty clay, low to medium plasticity, brown mottled light grey and dark grey, trace of fine to medium grained igneous gravel and ash.			>600	SCREEN: 8.30kg 0.3-1.0m NO FCF 8L BUCKET
					REFUSAL	1						>600	
								CI	Silty CLAY: medium plasticity, brown mottled red brown, trace of ash and fine to medium grained igneous gravel.	w≈PL	VSt	>600	RESIDUAL
					N = 9 3,4,5							350 330 400	
						2							
								CL-CI	Silty CLAY: low to medium plasticity, brown mottled orange brown and red brown, trace of ash.	w>PL	St		
					N = 8 3,4,4	3						200 180 180	
											St-VSt		
					N = 12 5,5,7	4						250 280 230	
						5				w≈PL	VSt-Hd		
					N = 19 7,9,10	6						420 380 400	
									END OF BOREHOLE AT 6.45m				
						7							

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BOREHOLE LOG

Borehole No. 19 1/1

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: 35521LF **Method:** SPIRAL AUGER **R.L. Surface:** 873.97m

Date: 25/10/22 **Datum:** AHD

Plant Type: JK400 **Logged/Checked by:** C.S.Y./O.F.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION						0		-	ASPHALTIC CONCRETE: 50mm.t	M			SCREEN: 7.24kg 0.05-0.4m NO FCF
					N = 23 9,10,13			CL-CI	FILL: Gravelly sand, fine to medium grained, red brown, fine to coarse grained igneous, trace of clay nodules and slag.	w≈PL	Hd		RESIDUAL
						1			Silty CLAY: low to medium plasticity, light grey mottled orange brown and dark grey, trace of fine to medium grained ironstone gravel and ash.			400 450 520	
					N = 18 6,8,10							420 500 600	
						2							
									Silty CLAY: low to medium plasticity, light brown mottled grey, red brown and orange brown, trace of ash.	w>PL	VSt		
					N = 8 4,4,4	3						250 280 320	
						4				w<PL	VSt-Hd		
					N = 11 3,5,6							350 400 420	
						5							
					N = 20 8,10,10	6						450 500 420	
						7			END OF BOREHOLE AT 6.45m				

JKGeotechnics

BOREHOLE LOG

Borehole No. 20
1/1

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: 35521LF **Method:** SPIRAL AUGER **R.L. Surface:** 873.91m

Date: 25/10/22 **Datum:** AHD

Plant Type: JK400 **Logged/Checked by:** C.S.Y./O.F.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
						0		-	ASPHALTIC CONCRETE: 50mm.t				
									FILL: Clayey sand, fine to medium grained, red brown, with fine to coarse grained igneous gravel, trace of brick fragments and slag.	M			APPEARS WELL COMPACTED
					N = 17 6,8,9					M			SCREEN: 3.30kg 0.05-0.5m NO FCF
						1			FILL: Gravelly sand, fine to medium grained, grey, fine to coarse grained igneous and ironstone gravel, with clay nodules, trace of brick fragments and slag.				SCREEN: 4.77kg 0.5-1.2m NO FCF
								CI	Silty CLAY: medium plasticity, light grey mottled orange brown, trace of fine to medium grained ironstone gravel and ash.	w>PL	VSt		RESIDUAL
					N > 27 9,12, 15/100mm							250	SPT REFUSAL ON IRONSTONE GRAVEL
					REFUSAL	2					Hd	270 300	
					N = 20 6,9,11	3				w<PL		450 400 500	
▼ AFTER 2 HOURS													
						4			as above, but with trace of extremely weathered siltstone bands.				
					N = 24 11,11,13								
ON COMPLET-ION ▼						5			Silty CLAY: medium plasticity, orange brown mottled red brown, trace of extremely weathered siltstone bands.	w<PL	Hd		
▶					N = 20 7,10,10	6							
									END OF BOREHOLE AT 6.45m				
						7							

ENVIRONMENTAL LOGS EXPLANATION NOTES

INTRODUCTION

These notes have been provided to amplify the environmental report in regard to classification methods, field procedures and certain matters relating to the logging of soil and rock. Not all notes are necessarily relevant to all reports.

Where geotechnical borehole logs are utilised for environmental purpose, reference should also be made to the explanatory notes included in the geotechnical report. Environmental logs are not suitable for geotechnical purposes.

The ground is a product of continuing natural and man-made processes and therefore exhibits a variety of characteristics and properties which vary from place to place and can change with time. Environmental studies include gathering and assimilating limited facts about these characteristics and properties in order to understand or predict the behaviour of the ground on a particular site under certain conditions. This report may contain such facts obtained by inspection, excavation, probing, sampling, testing or other means of investigation. If so, they are directly relevant only to the ground at the place where and time when the investigation was carried out.

DESCRIPTION AND CLASSIFICATION METHODS

The methods of description and classification of soils and rocks used in this report are based on Australian Standard 1726:2017 *'Geotechnical Site Investigations'*. In general, descriptions cover the following properties – soil or rock type, colour, structure, strength or density, and inclusions. Identification and classification of soil and rock involves judgement and the Company infers accuracy only to the extent that is common in current geoenvironmental practice.

Soil types are described according to the predominating particle size and behaviour as set out in the attached soil classification table qualified by the grading of other particles present (eg. sandy clay) as set out below:

Soil Classification	Particle Size
Clay	< 0.002mm
Silt	0.002 to 0.075mm
Sand	0.075 to 2.36mm
Gravel	2.36 to 63mm
Cobbles	63 to 200mm
Boulders	> 200mm

Non-cohesive soils are classified on the basis of relative density, generally from the results of Standard Penetration Test (SPT) as below:

Relative Density	SPT 'N' Value (blows/300mm)
Very loose (VL)	< 4
Loose (L)	4 to 10
Medium dense (MD)	10 to 30
Dense (D)	30 to 50
Very Dense (VD)	> 50

Cohesive soils are classified on the basis of strength (consistency) either by use of a hand penetrometer, vane shear, laboratory testing and/or tactile engineering examination. The strength terms are defined as follows.

Classification	Unconfined Compressive Strength (kPa)	Indicative Undrained Shear Strength (kPa)
Very Soft (VS)	≤ 25	≤ 12
Soft (S)	> 25 and ≤ 50	> 12 and ≤ 25
Firm (F)	> 50 and ≤ 100	> 25 and ≤ 50
Stiff (St)	> 100 and ≤ 200	> 50 and ≤ 100
Very Stiff (VSt)	> 200 and ≤ 400	> 100 and ≤ 200
Hard (Hd)	> 400	> 200
Friable (Fr)	Strength not attainable – soil crumbles	

Rock types are classified by their geological names, together with descriptive terms regarding weathering, strength, defects, etc. Where relevant, further information regarding rock classification is given in the text of the report. In the Sydney Basin, 'shale' is used to describe fissile mudstone, with a weakness parallel to bedding. Rocks with alternating inter-laminations of different grain size (eg. siltstone/claystone and siltstone/fine grained sandstone) are referred to as 'laminite'.

INVESTIGATION METHODS

The following is a brief summary of investigation methods currently adopted by the Company and some comments on their use and application. All methods except test pits, hand auger drilling and portable Dynamic Cone Penetrometers require the use of a mechanical rig which is commonly mounted on a truck chassis or track base.

Test Pits: These are normally excavated with a backhoe or a tracked excavator, allowing close examination of the insitu soils and 'weaker' bedrock if it is safe to descend into the pit. The depth of penetration is limited to about 3m for a backhoe and up to 6m for a large excavator. Limitations of test pits are the problems associated with disturbance and difficulty of reinstatement and the consequent effects on close-by structures. Care must be taken if construction is to be carried out near test pit locations to either properly recompact the backfill during construction or to design and construct the

structure so as not to be adversely affected by poorly compacted backfill at the test pit location.

Hand Auger Drilling: A borehole of 50mm to 100mm diameter is advanced by manually operated equipment. Refusal of the hand auger can occur on a variety of materials such as obstructions within any fill, tree roots, hard clay, gravel or ironstone, cobbles and boulders, and does not necessarily indicate rock level.

Continuous Spiral Flight Augers: The borehole is advanced using 75mm to 115mm diameter continuous spiral flight augers, which are withdrawn at intervals to allow sampling and insitu testing. This is a relatively economical means of drilling in clays and in sands above the water table. Samples are returned to the surface by the flights or may be collected after withdrawal of the auger flights, but they can be very disturbed and layers may become mixed. Information from the auger sampling (as distinct from specific sampling by SPTs or undisturbed samples) is of limited reliability due to mixing or softening of samples by groundwater, or uncertainties as to the original depth of the samples. Augering below the groundwater table is of even lesser reliability than augering above the water table.

Rock Augering: Use can be made of a Tungsten Carbide (TC) bit for auger drilling into rock to indicate rock quality and continuity by variation in drilling resistance and from examination of recovered rock cuttings. This method of investigation is quick and relatively inexpensive but provides only an indication of the likely rock strength and predicted values may be in error by a strength order. Where rock strengths may have a significant impact on construction feasibility or costs, then further investigation by means of cored boreholes may be warranted.

Wash Boring: The borehole is usually advanced by a rotary bit, with water being pumped down the drill rods and returned up the annulus, carrying the drill cuttings. Only major changes in stratification can be assessed from the cuttings, together with some information from "feel" and rate of penetration.

Mud Stabilised Drilling: Either Wash Boring or Continuous Core Drilling can use drilling mud as a circulating fluid to stabilise the borehole. The term 'mud' encompasses a range of products ranging from bentonite to polymers. The mud tends to mask the cuttings and reliable identification is only possible from intermittent intact sampling (eg. from SPT and U50 samples) or from rock coring, etc.

Continuous Core Drilling: A continuous core sample is obtained using a diamond tipped core barrel. Provided full core recovery is achieved (which is not always possible in very low strength rocks and granular soils), this technique provides a very reliable (but relatively expensive) method of investigation. In rocks, NMLC or HQ triple tube core barrels, which give a core of about 50mm and 61mm diameter, respectively, is usually used with water flush. The length of core recovered is compared to the length drilled and any length not recovered is shown as NO CORE. The location of NO CORE recovery is determined on site by the supervising engineer; where the location is uncertain, the loss is placed at the bottom of the drill run.

Standard Penetration Tests: Standard Penetration Tests (SPT) are used mainly in non-cohesive soils, but can also be used in cohesive soils, as a means of indicating density or strength and also of obtaining a relatively undisturbed sample. The test procedure is described in Australian Standard 1289.6.3.1–2004 (R2016) *'Methods of Testing Soils for Engineering Purposes, Soil Strength and Consolidation Tests – Determination of the Penetration Resistance of a Soil – Standard Penetration Test (SPT)'*.

The test is carried out in a borehole by driving a 50mm diameter split sample tube with a tapered shoe, under the impact of a 63.5kg hammer with a free fall of 760mm. It is normal for the tube to be driven in three successive 150mm increments and the 'N' value is taken as the number of blows for the last 300mm. In dense sands, very hard clays or weak rock, the full 450mm penetration may not be practicable and the test is discontinued.

The test results are reported in the following form:

- In the case where full penetration is obtained with successive blow counts for each 150mm of, say, 4, 6 and 7 blows, as

  N = 13
  4, 6, 7

- In a case where the test is discontinued short of full penetration, say after 15 blows for the first 150mm and 30 blows for the next 40mm, as

  N > 30
  15, 30/40mm

The results of the test can be related empirically to the engineering properties of the soil.

A modification to the SPT is where the same driving system is used with a solid 60° tipped steel cone of the same diameter as the SPT hollow sampler. The solid cone can be continuously driven for some distance in soft clays or loose sands, or may be used where damage would otherwise occur to the SPT. The results of this Solid Cone Penetration Test (SCPT) are shown as 'N_c' on the borehole logs, together with the number of blows per 150mm penetration.

LOGS

The borehole or test pit logs presented herein are an interpretation of the subsurface conditions, and their reliability will depend to some extent on the frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will enable the most reliable assessment, but is not always practicable or possible to justify on economic grounds. In any case, the boreholes or test pits represent only a very small sample of the total subsurface conditions.

The terms and symbols used in preparation of the logs are defined in the following pages.

Interpretation of the information shown on the logs, and its application to design and construction, should therefore take into account the spacing of boreholes or test pits, the method of drilling or excavation, the frequency of sampling and testing and the possibility of other than 'straight line' variations between the boreholes or test pits. Subsurface conditions between boreholes or test pits may vary significantly from conditions encountered at the borehole or test pit locations.

GROUNDWATER

Where groundwater levels are measured in boreholes, there are several potential problems:

- Although groundwater may be present, in low permeability soils it may enter the hole slowly or perhaps not at all during the time it is left open.
- A localised perched water table may lead to an erroneous indication of the true water table.
- Water table levels will vary from time to time with seasons or recent weather changes and may not be the same at the time of construction.
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must be washed out of the hole or 'reverted' chemically if reliable water observations are to be made.

More reliable measurements can be made by installing standpipes which are read after the groundwater level has stabilised at intervals ranging from several days to perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from perched water tables or surface water.

FILL

The presence of fill materials can often be determined only by the inclusion of foreign objects (eg. bricks, steel, etc) or by distinctly unusual colour, texture or fabric. Identification of the extent of fill materials will also depend on investigation methods and frequency. Where natural soils similar to those at the site are used for fill, it may be difficult with limited testing and sampling to reliably assess the extent of the fill.

The presence of fill materials is usually regarded with caution as the possible variation in density and material type is much greater than with natural soil deposits. Consequently, there is an increased risk of adverse environmental characteristics or behaviour. If the volume and nature of fill is of importance to a project, then frequent test pit excavations are preferable to boreholes.

LABORATORY TESTING

Laboratory testing has not been undertaken to confirm the soil classification and rock strengths indicated on the environmental logs unless noted in the report.

SYMBOL LEGENDS

SOIL


FILL


TOPSOIL


CLAY (CL, CI, CH)


SILT (ML, MH)


SAND (SP, SW)


GRAVEL (GP, GW)


SANDY CLAY (CL, CI, CH)


SILTY CLAY (CL, CI, CH)


CLAYEY SAND (SC)


SILTY SAND (SM)


GRAVELLY CLAY (CL, CI, CH)


CLAYEY GRAVEL (GC)


SANDY SILT (ML, MH)


PEAT AND HIGHLY ORGANIC SOILS (Pt)

ROCK


CONGLOMERATE


SANDSTONE


SHALE/MUDSTONE


SILTSTONE


CLAYSTONE


COAL


LAMINITE


LIMESTONE


PHYLLITE, SCHIST


TUFF


GRANITE, GABBRO


DOLERITE, DIORITE


BASALT, ANDESITE


QUARTZITE

OTHER MATERIALS


BRICKS OR PAVERS


CONCRETE


ASPHALTIC CONCRETE

CLASSIFICATION OF COARSE AND FINE GRAINED SOILS

Major Divisions		Group Symbol	Typical Names	Field Classification of Sand and Gravel	Laboratory Classification	
Coarse grained soil (more than 65% of soil excluding oversize fraction is greater than 0.075mm)	GRAVEL (more than half of coarse fraction is larger than 2.36mm	GW	Gravel and gravel-sand mixtures, little or no fines	Wide range in grain size and substantial amounts of all intermediate sizes, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	$C_u > 4$ $1 < C_c < 3$
		GP	Gravel and gravel-sand mixtures, little or no fines, uniform gravels	Predominantly one size or range of sizes with some intermediate sizes missing, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	Fails to comply with above
		GM	Gravel-silt mixtures and gravel-sand-silt mixtures	'Dirty' materials with excess of non-plastic fines, zero to medium dry strength	≥ 12% fines, fines are silty	Fines behave as silt
		GC	Gravel-clay mixtures and gravel-sand-clay mixtures	'Dirty' materials with excess of plastic fines, medium to high dry strength	≥ 12% fines, fines are clayey	Fines behave as clay
	SAND (more than half of coarse fraction is smaller than 2.36mm)	SW	Sand and gravel-sand mixtures, little or no fines	Wide range in grain size and substantial amounts of all intermediate sizes, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	$C_u > 6$ $1 < C_c < 3$
		SP	Sand and gravel-sand mixtures, little or no fines	Predominantly one size or range of sizes with some intermediate sizes missing, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	Fails to comply with above
		SM	Sand-silt mixtures	'Dirty' materials with excess of non-plastic fines, zero to medium dry strength	≥ 12% fines, fines are silty	N/A
		SC	Sand-clay mixtures	'Dirty' materials with excess of plastic fines, medium to high dry strength	≥ 12% fines, fines are clayey	

Major Divisions		Group Symbol	Typical Names	Field Classification of Silt and Clay			Laboratory Classification
				Dry Strength	Dilatancy	Toughness	% < 0.075mm
ine grained soils (more than 35% of soil excluding oversize fraction is less than 0.075mm)	SILT and CLAY (low to medium plasticity)	ML	Inorganic silt and very fine sand, rock flour, silty or clayey fine sand or silt with low plasticity	None to low	Slow to rapid	Low	Below A line
		CL, CI	Inorganic clay of low to medium plasticity, gravelly clay, sandy clay	Medium to high	None to slow	Medium	Above A line
		OL	Organic silt	Low to medium	Slow	Low	Below A line
	SILT and CLAY (high plasticity)	MH	Inorganic silt	Low to medium	None to slow	Low to medium	Below A line
		CH	Inorganic clay of high plasticity	High to very high	None	High	Above A line
		OH	Organic clay of medium to high plasticity, organic silt	Medium to high	None to very slow	Low to medium	Below A line
	Highly organic soil	Pt	Peat, highly organic soil	–	–	–	–

Laboratory Classification Criteria

A well graded coarse grained soil is one for which the coefficient of uniformity $Cu > 4$ and the coefficient of curvature $1 < C_c < 3$. Otherwise, the soil is poorly graded. These coefficients are given by:

$$C_U = \frac{D_{60}}{D_{10}} \qquad and \qquad C_C = \frac{(D_{30})^2}{D_{10}\, D_{60}}$$

Where D_{10}, D_{30} and D_{60} are those grain sizes for which 10%, 30% and 60% of the soil grains, respectively, are smaller.

NOTES:

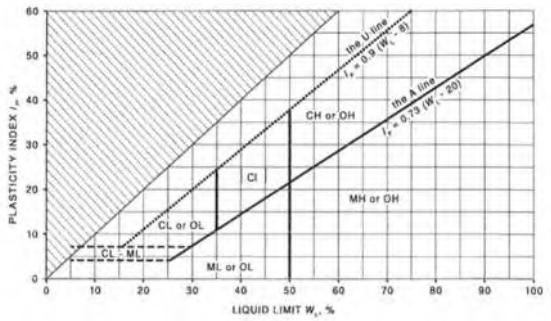
1 For a coarse grained soil with a fines content between 5% and 12%, the soil is given a dual classification comprising the two group symbols separated by a dash; for example, for a poorly graded gravel with between 5% and 12% silt fines, the classification is GP-GM.

2 Where the grading is determined from laboratory tests, it is defined by coefficients of curvature (C_c) and uniformity (C_u) derived from the particle size distribution curve.

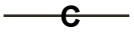
3 Clay soils with liquid limits > 35% and ≤ 50% may be classified as being of medium plasticity.

4 The U line on the Modified Casagrande Chart is an approximate upper bound for most natural soils.

Modified Casagrande Chart for Classifying Silts and Clays according to their Behaviour



LOG SYMBOLS

Log Column	Symbol	Definition
Groundwater Record		Standing water level. Time delay following completion of drilling/excavation may be shown.
		Extent of borehole/test pit collapse shortly after drilling/excavation.
		Groundwater seepage into borehole or test pit noted during drilling or excavation.
Samples	ES	Sample taken over depth indicated, for environmental analysis.
	U50	Undisturbed 50mm diameter tube sample taken over depth indicated.
	DB	Bulk disturbed sample taken over depth indicated.
	DS	Small disturbed bag sample taken over depth indicated.
	ASB	Soil sample taken over depth indicated, for asbestos analysis.
	ASS	Soil sample taken over depth indicated, for acid sulfate soil analysis.
	SAL	Soil sample taken over depth indicated, for salinity analysis.
	PFAS	Soil sample taken over depth indicated, for analysis of Per- and Polyfluoroalkyl Substances.
Field Tests	N = 17 4, 7, 10	Standard Penetration Test (SPT) performed between depths indicated by lines. Individual figures show blows per 150mm penetration. 'Refusal' refers to apparent hammer refusal within the corresponding 150mm depth increment.
	N_c = 5 7 3R	Solid Cone Penetration Test (SCPT) performed between depths indicated by lines. Individual figures show blows per 150mm penetration for 60° solid cone driven by SPT hammer. 'R' refers to apparent hammer refusal within the corresponding 150mm depth increment.
	VNS = 25	Vane shear reading in kPa of undrained shear strength.
	PID = 100	Photoionisation detector reading in ppm (soil sample headspace test).
Moisture Condition (Fine Grained Soils)	w > PL	Moisture content estimated to be greater than plastic limit.
	$w \approx$ PL	Moisture content estimated to be approximately equal to plastic limit.
	w < PL	Moisture content estimated to be less than plastic limit.
	$w \approx$ LL	Moisture content estimated to be near liquid limit.
	w > LL	Moisture content estimated to be wet of liquid limit.
(Coarse Grained Soils)	D	DRY – runs freely through fingers.
	M	MOIST – does not run freely but no free water visible on soil surface.
	W	WET – free water visible on soil surface.
Strength (Consistency) Cohesive Soils	VS	VERY SOFT – unconfined compressive strength ≤ 25kPa.
	S	SOFT – unconfined compressive strength > 25kPa and ≤ 50kPa.
	F	FIRM – unconfined compressive strength > 50kPa and ≤ 100kPa.
	St	STIFF – unconfined compressive strength > 100kPa and ≤ 200kPa.
	VSt	VERY STIFF – unconfined compressive strength > 200kPa and ≤ 400kPa.
	Hd	HARD – unconfined compressive strength > 400kPa.
	Fr	FRIABLE – strength not attainable, soil crumbles.
	( )	Bracketed symbol indicates estimated consistency based on tactile examination or other assessment.
Density Index/ Relative Density (Cohesionless Soils)		**Density Index (I_D) Range (%)** / **SPT 'N' Value Range (Blows/300mm)** VERY LOOSE: ≤ 15 / 0 – 4 LOOSE: > 15 and ≤ 35 / 4 – 10 MEDIUM DENSE: > 35 and ≤ 65 / 10 – 30 DENSE: > 65 and ≤ 85 / 30 – 50 VERY DENSE: > 85 / > 50
	VL	
	L	
	MD	
	D	
	VD	
	( )	Bracketed symbol indicates estimated density based on ease of drilling or other assessment.

Log Column	Symbol	Definition
Hand Penetrometer Readings	300 250	Measures reading in kPa of unconfined compressive strength. Numbers indicate individual test results on representative undisturbed material unless noted otherwise.
Remarks	'V' bit	Hardened steel 'V' shaped bit.
	'TC' bit	Twin pronged tungsten carbide bit.
	T_{60}	Penetration of auger string in mm under static load of rig applied by drill head hydraulics without rotation of augers.
	Soil Origin	The geological origin of the soil can generally be described as: RESIDUAL – soil formed directly from insitu weathering of the underlying rock. No visible structure or fabric of the parent rock. EXTREMELY WEATHERED – soil formed directly from insitu weathering of the underlying rock. Material is of soil strength but retains the structure and/or fabric of the parent rock. ALLUVIAL – soil deposited by creeks and rivers. ESTUARINE – soil deposited in coastal estuaries, including sediments caused by inflowing creeks and rivers, and tidal currents. MARINE – soil deposited in a marine environment. AEOLIAN – soil carried and deposited by wind. COLLUVIAL – soil and rock debris transported downslope by gravity, with or without the assistance of flowing water. Colluvium is usually a thick deposit formed from a landslide. The description 'slopewash' is used for thinner surficial deposits. LITTORAL – beach deposited soil.

Classification of Material Weathering

Term		Abbreviation		Definition
Residual Soil		RS		Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are no longer visible, but the soil has not been significantly transported.
Extremely Weathered		XW		Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are still visible.
Highly Weathered	Distinctly Weathered (Note 1)	HW	DW	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable. Rock strength is significantly changed by weathering. Some primary minerals have weathered to clay minerals. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores.
Moderately Weathered		MW		The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable, but shows little or no change of strength from fresh rock.
Slightly Weathered		SW		Rock is partially discoloured with staining or bleaching along joints but shows little or no change of strength from fresh rock.
Fresh		FR		Rock shows no sign of decomposition of individual minerals or colour changes.

NOTE 1: The term 'Distinctly Weathered' is used where it is not practicable to distinguish between 'Highly Weathered' and 'Moderately Weathered' rock. 'Distinctly Weathered' is defined as follows: *'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'*. There is some change in rock strength.

Rock Material Strength Classification

Term	Abbreviation	Uniaxial Compressive Strength (MPa)	Guide to Strength	
			Point Load Strength Index $Is_{(50)}$ (MPa)	Field Assessment
Very Low Strength	VL	0.6 to 2	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 30mm thick can be broken by finger pressure.
Low Strength	L	2 to 6	0.1 to 0.3	Easily scored with a knife; indentations 1mm to 3mm show in the specimen with firm blows of the pick point; has dull sound under hammer. A piece of core 150mm long by 50mm diameter may be broken by hand. Sharp edges of core may be friable and break during handling.
Medium Strength	M	6 to 20	0.3 to 1	Scored with a knife; a piece of core 150mm long by 50mm diameter can be broken by hand with difficulty.
High Strength	H	20 to 60	1 to 3	A piece of core 150mm long by 50mm diameter cannot be broken by hand but can be broken by a pick with a single firm blow; rock rings under hammer.
Very High Strength	VH	60 to 200	3 to 10	Hand specimen breaks with pick after more than one blow; rock rings under hammer.
Extremely High Strength	EH	> 200	> 10	Specimen requires many blows with geological pick to break through intact material; rock rings under hammer.

Appendix D: Laboratory Report(s) & COC Documents

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CERTIFICATE OF ANALYSIS 309378

Client Details

Client	JK Environments
Attention	Katrina Taylor
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E35521PT, Blayney**
Number of Samples	69 Soil, 1 Water
Date samples received	31/10/2022
Date completed instructions received	31/10/2022

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	07/11/2022
Date of Issue	07/11/2022

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Authorised by Asbestos Approved Signatory: Lucy Zhu

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Giovanni Agosti, Group Technical Manager
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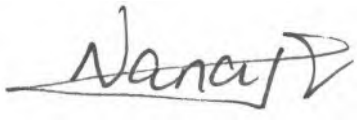
Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		309378-1	309378-5	309378-10	309378-13	309378-17
Your Reference	UNITS	BH1	BH3	BH5	BH6	BH10
Depth		0.05-0.2	0-0.1	0-0.1	0-0.1	0-0.2
Type of sample		Soil	Soil	Soil	Soil	Soil
Date Sampled		25/10/2022	24/10/2022	24/10/2022	25/10/2022	28/10/2022
Date extracted	-	03/11/2022	03/11/2022	03/11/2022	03/11/2022	03/11/2022
Date analysed	-	07/11/2022	07/11/2022	07/11/2022	07/11/2022	07/11/2022
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	87	84	85	83	84

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		309378-19	309378-22	309378-27	309378-30	309378-32
Your Reference	UNITS	BH12	BH14	BH15	BH17	BH20
Depth		0-0.1	0-0.1	0-0.1	0.05-0.2	0.05-0.2
Type of sample		Soil	Soil	Soil	Soil	Soil
Date Sampled		26/10/2022	26/10/2022	26/10/2022	25/10/2022	25/10/2022
Date extracted	-	03/11/2022	03/11/2022	03/11/2022	03/11/2022	03/11/2022
Date analysed	-	07/11/2022	07/11/2022	07/11/2022	07/11/2022	07/11/2022
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	81	90	93	93	98

vTRH(C6-C10)/BTEXN in Soil				
Our Reference		309378-38	309378-40	309378-41
Your Reference	UNITS	SDUP3	TB-S1	TS-S1
Depth		-	-	-
Type of sample		Soil	Soil	Soil
Date Sampled		26/10/2022	28/10/2022	28/10/2022
Date extracted	-	03/11/2022	03/11/2022	03/11/2022
Date analysed	-	07/11/2022	07/11/2022	07/11/2022
TRH C_6 - C_9	mg/kg	<25	<25	[NA]
TRH C_6 - C_{10}	mg/kg	<25	<25	[NA]
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	[NA]
Benzene	mg/kg	<0.2	<0.2	101%
Toluene	mg/kg	<0.5	<0.5	104%
Ethylbenzene	mg/kg	<1	<1	97%
m+p-xylene	mg/kg	<2	<2	99%
o-Xylene	mg/kg	<1	<1	98%
Naphthalene	mg/kg	<1	<1	[NA]
Total +ve Xylenes	mg/kg	<1	<1	[NT]
Surrogate aaa-Trifluorotoluene	%	95	99	80

svTRH (C10-C40) in Soil						
Our Reference		309378-1	309378-5	309378-10	309378-13	309378-17
Your Reference	UNITS	BH1	BH3	BH5	BH6	BH10
Depth		0.05-0.2	0-0.1	0-0.1	0-0.1	0-0.2
Type of sample		Soil	Soil	Soil	Soil	Soil
Date Sampled		25/10/2022	24/10/2022	24/10/2022	25/10/2022	28/10/2022
Date extracted	-	03/11/2022	03/11/2022	03/11/2022	03/11/2022	03/11/2022
Date analysed	-	04/11/2022	04/11/2022	04/11/2022	04/11/2022	04/11/2022
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	110	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	110	<50	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	120	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	150	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	270	<50	<50	<50	<50
Surrogate o-Terphenyl	%	81	79	81	79	79

svTRH (C10-C40) in Soil						
Our Reference		309378-19	309378-22	309378-27	309378-30	309378-32
Your Reference	UNITS	BH12	BH14	BH15	BH17	BH20
Depth		0-0.1	0-0.1	0-0.1	0.05-0.2	0.05-0.2
Type of sample		Soil	Soil	Soil	Soil	Soil
Date Sampled		26/10/2022	26/10/2022	26/10/2022	25/10/2022	25/10/2022
Date extracted	-	03/11/2022	03/11/2022	03/11/2022	03/11/2022	03/11/2022
Date analysed	-	04/11/2022	04/11/2022	04/11/2022	04/11/2022	04/11/2022
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	200
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	200
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	120	<100	<100	<100	190
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	300
Total +ve TRH (>C10-C40)	mg/kg	120	<50	<50	<50	490
Surrogate o-Terphenyl	%	80	79	79	78	95

svTRH (C10-C40) in Soil			
Our Reference		309378-38	309378-40
Your Reference	UNITS	SDUP3	TB-S1
Depth		-	-
Type of sample		Soil	Soil
Date Sampled		26/10/2022	28/10/2022
Date extracted	-	03/11/2022	03/11/2022
Date analysed	-	04/11/2022	04/11/2022
TRH C_{10} - C_{14}	mg/kg	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50
Surrogate o-Terphenyl	%	80	76

PAHs in Soil						
Our Reference		309378-1	309378-5	309378-10	309378-13	309378-17
Your Reference	UNITS	BH1	BH3	BH5	BH6	BH10
Depth		0.05-0.2	0-0.1	0-0.1	0-0.1	0-0.2
Type of sample		Soil	Soil	Soil	Soil	Soil
Date Sampled		25/10/2022	24/10/2022	24/10/2022	25/10/2022	28/10/2022
Date extracted	-	03/11/2022	03/11/2022	03/11/2022	03/11/2022	03/11/2022
Date analysed	-	05/11/2022	05/11/2022	05/11/2022	05/11/2022	05/11/2022
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<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	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	0.5	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	0.2	0.09	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	0.79	0.09	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	83	88	88	83	84

PAHs in Soil						
Our Reference		309378-19	309378-22	309378-27	309378-30	309378-32
Your Reference	UNITS	BH12	BH14	BH15	BH17	BH20
Depth		0-0.1	0-0.1	0-0.1	0.05-0.2	0.05-0.2
Type of sample		Soil	Soil	Soil	Soil	Soil
Date Sampled		26/10/2022	26/10/2022	26/10/2022	25/10/2022	25/10/2022
Date extracted	-	03/11/2022	03/11/2022	03/11/2022	03/11/2022	03/11/2022
Date analysed	-	05/11/2022	05/11/2022	05/11/2022	05/11/2022	05/11/2022
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<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	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	72	67	75	87	81

PAHs in Soil			
Our Reference		309378-38	309378-40
Your Reference	UNITS	SDUP3	TB-S1
Depth		-	-
Type of sample		Soil	Soil
Date Sampled		26/10/2022	28/10/2022
Date extracted	-	03/11/2022	03/11/2022
Date analysed	-	05/11/2022	05/11/2022
Naphthalene	mg/kg	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	81	80

Organochlorine Pesticides in soil						
Our Reference		309378-1	309378-5	309378-10	309378-13	309378-17
Your Reference	UNITS	BH1	BH3	BH5	BH6	BH10
Depth		0.05-0.2	0-0.1	0-0.1	0-0.1	0-0.2
Type of sample		Soil	Soil	Soil	Soil	Soil
Date Sampled		25/10/2022	24/10/2022	24/10/2022	25/10/2022	28/10/2022
Date extracted	-	03/11/2022	03/11/2022	03/11/2022	03/11/2022	03/11/2022
Date analysed	-	05/11/2022	05/11/2022	05/11/2022	05/11/2022	05/11/2022
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	77	79	77	76	74

Organochlorine Pesticides in soil						
Our Reference		309378-19	309378-22	309378-27	309378-30	309378-32
Your Reference	UNITS	BH12	BH14	BH15	BH17	BH20
Depth		0-0.1	0-0.1	0-0.1	0.05-0.2	0.05-0.2
Type of sample		Soil	Soil	Soil	Soil	Soil
Date Sampled		26/10/2022	26/10/2022	26/10/2022	25/10/2022	25/10/2022
Date extracted	-	03/11/2022	03/11/2022	03/11/2022	03/11/2022	03/11/2022
Date analysed	-	05/11/2022	05/11/2022	05/11/2022	05/11/2022	05/11/2022
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	69	65	71	75	72

Organochlorine Pesticides in soil			
Our Reference		309378-38	309378-40
Your Reference	UNITS	SDUP3	TB-S1
Depth		-	-
Type of sample		Soil	Soil
Date Sampled		26/10/2022	28/10/2022
Date extracted	-	03/11/2022	03/11/2022
Date analysed	-	05/11/2022	05/11/2022
alpha-BHC	mg/kg	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1
Surrogate TCMX	%	74	71

Organophosphorus Pesticides in Soil						
Our Reference		309378-1	309378-5	309378-10	309378-13	309378-17
Your Reference	UNITS	BH1	BH3	BH5	BH6	BH10
Depth		0.05-0.2	0-0.1	0-0.1	0-0.1	0-0.2
Type of sample		Soil	Soil	Soil	Soil	Soil
Date Sampled		25/10/2022	24/10/2022	24/10/2022	25/10/2022	28/10/2022
Date extracted	-	03/11/2022	03/11/2022	03/11/2022	03/11/2022	03/11/2022
Date analysed	-	05/11/2022	05/11/2022	05/11/2022	05/11/2022	05/11/2022
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	77	79	77	76	74

Organophosphorus Pesticides in Soil						
Our Reference		309378-19	309378-22	309378-27	309378-30	309378-32
Your Reference	UNITS	BH12	BH14	BH15	BH17	BH20
Depth		0-0.1	0-0.1	0-0.1	0.05-0.2	0.05-0.2
Type of sample		Soil	Soil	Soil	Soil	Soil
Date Sampled		26/10/2022	26/10/2022	26/10/2022	25/10/2022	25/10/2022
Date extracted	-	03/11/2022	03/11/2022	03/11/2022	03/11/2022	03/11/2022
Date analysed	-	05/11/2022	05/11/2022	05/11/2022	05/11/2022	05/11/2022
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	69	65	71	75	72

Organophosphorus Pesticides in Soil			
Our Reference		309378-38	309378-40
Your Reference	UNITS	SDUP3	TB-S1
Depth		-	-
Type of sample		Soil	Soil
Date Sampled		26/10/2022	28/10/2022
Date extracted	-	03/11/2022	03/11/2022
Date analysed	-	05/11/2022	05/11/2022
Dichlorvos	mg/kg	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1
Surrogate TCMX	%	74	71

PCBs in Soil						
Our Reference		309378-1	309378-5	309378-10	309378-13	309378-17
Your Reference	UNITS	BH1	BH3	BH5	BH6	BH10
Depth		0.05-0.2	0-0.1	0-0.1	0-0.1	0-0.2
Type of sample		Soil	Soil	Soil	Soil	Soil
Date Sampled		25/10/2022	24/10/2022	24/10/2022	25/10/2022	28/10/2022
Date extracted	-	03/11/2022	03/11/2022	03/11/2022	03/11/2022	03/11/2022
Date analysed	-	05/11/2022	05/11/2022	05/11/2022	05/11/2022	05/11/2022
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	77	79	77	76	74

PCBs in Soil						
Our Reference		309378-19	309378-22	309378-27	309378-30	309378-32
Your Reference	UNITS	BH12	BH14	BH15	BH17	BH20
Depth		0-0.1	0-0.1	0-0.1	0.05-0.2	0.05-0.2
Type of sample		Soil	Soil	Soil	Soil	Soil
Date Sampled		26/10/2022	26/10/2022	26/10/2022	25/10/2022	25/10/2022
Date extracted	-	03/11/2022	03/11/2022	03/11/2022	03/11/2022	03/11/2022
Date analysed	-	05/11/2022	05/11/2022	05/11/2022	05/11/2022	05/11/2022
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	69	65	71	75	72

PCBs in Soil			
Our Reference		309378-38	309378-40
Your Reference	UNITS	SDUP3	TB-S1
Depth		-	-
Type of sample		Soil	Soil
Date Sampled		26/10/2022	28/10/2022
Date extracted	-	03/11/2022	03/11/2022
Date analysed	-	05/11/2022	05/11/2022
Aroclor 1016	mg/kg	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1
Surrogate TCMX	%	74	71

Acid Extractable metals in soil						
Our Reference		309378-1	309378-5	309378-10	309378-13	309378-17
Your Reference	UNITS	BH1	BH3	BH5	BH6	BH10
Depth		0.05-0.2	0-0.1	0-0.1	0-0.1	0-0.2
Type of sample		Soil	Soil	Soil	Soil	Soil
Date Sampled		25/10/2022	24/10/2022	24/10/2022	25/10/2022	28/10/2022
Date prepared	-	04/11/2022	04/11/2022	04/11/2022	04/11/2022	04/11/2022
Date analysed	-	06/11/2022	06/11/2022	06/11/2022	06/11/2022	06/11/2022
Arsenic	mg/kg	<4	9	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	10	53	19	26	21
Copper	mg/kg	24	30	36	38	18
Lead	mg/kg	1	18	40	11	16
Mercury	mg/kg	<0.1	<0.1	0.8	<0.1	<0.1
Nickel	mg/kg	3	14	7	7	10
Zinc	mg/kg	7	54	200	36	26

Acid Extractable metals in soil						
Our Reference		309378-19	309378-22	309378-27	309378-30	309378-32
Your Reference	UNITS	BH12	BH14	BH15	BH17	BH20
Depth		0-0.1	0-0.1	0-0.1	0.05-0.2	0.05-0.2
Type of sample		Soil	Soil	Soil	Soil	Soil
Date Sampled		26/10/2022	26/10/2022	26/10/2022	25/10/2022	25/10/2022
Date prepared	-	04/11/2022	04/11/2022	04/11/2022	04/11/2022	04/11/2022
Date analysed	-	06/11/2022	06/11/2022	06/11/2022	06/11/2022	06/11/2022
Arsenic	mg/kg	<4	12	4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	29	32	28	23	33
Copper	mg/kg	18	14	15	20	52
Lead	mg/kg	19	20	15	2	3
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	4	7	6	3	6
Zinc	mg/kg	32	23	26	14	12

Acid Extractable metals in soil			
Our Reference		309378-38	309378-40
Your Reference	UNITS	SDUP3	TB-S1
Depth		-	-
Type of sample		Soil	Soil
Date Sampled		26/10/2022	28/10/2022
Date prepared	-	04/11/2022	04/11/2022
Date analysed	-	06/11/2022	06/11/2022
Arsenic	mg/kg	<4	<4
Cadmium	mg/kg	<0.4	<0.4
Chromium	mg/kg	29	3
Copper	mg/kg	16	<1
Lead	mg/kg	17	2
Mercury	mg/kg	<0.1	<0.1
Nickel	mg/kg	7	<1
Zinc	mg/kg	28	2

Moisture						
Our Reference		309378-1	309378-5	309378-10	309378-13	309378-17
Your Reference	UNITS	BH1	BH3	BH5	BH6	BH10
Depth		0.05-0.2	0-0.1	0-0.1	0-0.1	0-0.2
Type of sample		Soil	Soil	Soil	Soil	Soil
Date Sampled		25/10/2022	24/10/2022	24/10/2022	25/10/2022	28/10/2022
Date prepared	-	03/11/2022	03/11/2022	03/11/2022	03/11/2022	03/11/2022
Date analysed	-	04/11/2022	04/11/2022	04/11/2022	04/11/2022	04/11/2022
Moisture	%	3.8	15	20	17	15

Moisture						
Our Reference		309378-19	309378-22	309378-27	309378-30	309378-32
Your Reference	UNITS	BH12	BH14	BH15	BH17	BH20
Depth		0-0.1	0-0.1	0-0.1	0.05-0.2	0.05-0.2
Type of sample		Soil	Soil	Soil	Soil	Soil
Date Sampled		26/10/2022	26/10/2022	26/10/2022	25/10/2022	25/10/2022
Date prepared	-	03/11/2022	03/11/2022	03/11/2022	03/11/2022	03/11/2022
Date analysed	-	04/11/2022	04/11/2022	04/11/2022	04/11/2022	04/11/2022
Moisture	%	18	15	12	9.5	6.7

Moisture			
Our Reference		309378-38	309378-40
Your Reference	UNITS	SDUP3	TB-S1
Depth		-	-
Type of sample		Soil	Soil
Date Sampled		26/10/2022	28/10/2022
Date prepared	-	03/11/2022	03/11/2022
Date analysed	-	04/11/2022	04/11/2022
Moisture	%	18	5.2

Asbestos ID - soils NEPM - ASB-001						
Our Reference		309378-1	309378-7	309378-10	309378-13	309378-17
Your Reference	UNITS	BH1	BH3	BH5	BH6	BH10
Depth		0.05-0.2	0.4-0.65	0-0.1	0-0.1	0-0.2
Type of sample		Soil	Soil	Soil	Soil	Soil
Date Sampled		25/10/2022	24/10/2022	24/10/2022	25/10/2022	28/10/2022
Date analysed	-	04/11/2022	04/11/2022	04/11/2022	04/11/2022	04/11/2022
Sample mass tested	g	870.85	738.11	619.37	777.81	736.87
Sample Description	-	Brown fine-grained soil and rocks	Brown fine-grained soil and rocks	Brown fine-grained soil and rocks	Brown fine-grained soil and rocks	Brown coarse-grained soil and rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos[#1]	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	Chrysotile Amosite	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–	–	–	–
FA and AF Estimation*	g	–	0.0628	–	–	–
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01	<0.01	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	0.0085	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM - ASB-001						
Our Reference		309378-19	309378-22	309378-27	309378-30	309378-33
Your Reference	UNITS	BH12	BH14	BH15	BH17	BH20
Depth		0-0.1	0-0.1	0-0.1	0.05-0.2	0.5-0.7
Type of sample		Soil	Soil	Soil	Soil	Soil
Date Sampled		26/10/2022	26/10/2022	26/10/2022	25/10/2022	25/10/2022
Date analysed	-	04/11/2022	04/11/2022	04/11/2022	04/11/2022	04/11/2022
Sample mass tested	g	758.96	732.9	701.89	772.09	917.51
Sample Description	-	Brown coarse-grained soil and rocks	Brown coarse-grained soil and rocks	Brown fine-grained soil and rocks	Brown fine-grained soil and rocks	Brown coarse-grained soil and rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos#1	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–	–	–	–
FA and AF Estimation*	g	–	–	–	–	–
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01	<0.01	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

vTRH(C6-C10)/BTEXN in Water		
Our Reference		309378-42
Your Reference	UNITS	FR-SPT-S1
Depth		-
Type of sample		Water
Date Sampled		27/10/2022
Date extracted	-	03/11/2022
Date analysed	-	07/11/2022
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	%	110
Surrogate toluene-d8	%	106
Surrogate 4-BFB	%	103

svTRH (C10-C40) in Water		
Our Reference		309378-42
Your Reference	UNITS	FR-SPT-S1
Depth		-
Type of sample		Water
Date Sampled		27/10/2022
Date extracted	-	03/11/2022
Date analysed	-	04/11/2022
TRH C_{10} - C_{14}	µg/L	<50
TRH C_{15} - C_{28}	µg/L	130
TRH C_{29} - C_{36}	µg/L	<100
Total +ve TRH (C10-C36)	µg/L	130
TRH >C_{10} - C_{16}	µg/L	160
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	160
TRH >C_{16} - C_{34}	µg/L	<100
TRH >C_{34} - C_{40}	µg/L	<100
Total +ve TRH (>C10-C40)	µg/L	160
Surrogate o-Terphenyl	%	79

PAHs in Water		
Our Reference		309378-42
Your Reference	UNITS	FR-SPT-S1
Depth		-
Type of sample		Water
Date Sampled		27/10/2022
Date extracted	-	03/11/2022
Date analysed	-	06/11/2022
Naphthalene	µg/L	<1
Acenaphthylene	µg/L	<1
Acenaphthene	µg/L	<1
Fluorene	µg/L	<1
Phenanthrene	µg/L	<1
Anthracene	µg/L	<1
Fluoranthene	µg/L	<1
Pyrene	µg/L	<1
Benzo(a)anthracene	µg/L	<1
Chrysene	µg/L	<1
Benzo(b,j+k)fluoranthene	µg/L	<2
Benzo(a)pyrene	µg/L	<1
Indeno(1,2,3-c,d)pyrene	µg/L	<1
Dibenzo(a,h)anthracene	µg/L	<1
Benzo(g,h,i)perylene	µg/L	<1
Benzo(a)pyrene TEQ	µg/L	<5
Total +ve PAH's	µg/L	NIL (+)VE
Surrogate p-Terphenyl-d14	%	86

Organochlorine Pesticides in Water		
Our Reference		309378-42
Your Reference	UNITS	FR-SPT-S1
Depth		-
Type of sample		Water
Date Sampled		27/10/2022
Date extracted	-	03/11/2022
Date analysed	-	06/11/2022
alpha-BHC	µg/L	<0.2
HCB	µg/L	<0.2
beta-BHC	µg/L	<0.2
gamma-BHC	µg/L	<0.2
Heptachlor	µg/L	<0.2
delta-BHC	µg/L	<0.2
Aldrin	µg/L	<0.2
Heptachlor Epoxide	µg/L	<0.2
gamma-Chlordane	µg/L	<0.2
alpha-Chlordane	µg/L	<0.2
Endosulfan I	µg/L	<0.2
pp-DDE	µg/L	<0.2
Dieldrin	µg/L	<0.2
Endrin	µg/L	<0.2
Endosulfan II	µg/L	<0.2
pp-DDD	µg/L	<0.2
Endrin Aldehyde	µg/L	<0.2
pp-DDT	µg/L	<0.2
Endosulfan Sulphate	µg/L	<0.2
Methoxychlor	µg/L	<0.2
Surrogate TCMX	%	78

OP Pesticides in Water		
Our Reference		309378-42
Your Reference	UNITS	FR-SPT-S1
Depth		-
Type of sample		Water
Date Sampled		27/10/2022
Date extracted	-	03/11/2022
Date analysed	-	06/11/2022
Dichlorvos	µg/L	<0.2
Dimethoate	µg/L	<0.2
Diazinon	µg/L	<0.2
Chlorpyriphos-methyl	µg/L	<0.2
Ronnel	µg/L	<0.2
Fenitrothion	µg/L	<0.2
Malathion	µg/L	<0.2
Chlorpyriphos	µg/L	<0.2
Parathion	µg/L	<0.2
Bromophos ethyl	µg/L	<0.2
Ethion	µg/L	<0.2
Azinphos-methyl (Guthion)	µg/L	<0.2
Surrogate TCMX	%	78

PCBs in Water		
Our Reference		309378-42
Your Reference	UNITS	FR-SPT-S1
Depth		-
Type of sample		Water
Date Sampled		27/10/2022
Date extracted	-	03/11/2022
Date analysed	-	06/11/2022
Aroclor 1016	µg/L	<2
Aroclor 1221	µg/L	<2
Aroclor 1232	µg/L	<2
Aroclor 1242	µg/L	<2
Aroclor 1248	µg/L	<2
Aroclor 1254	µg/L	<2
Aroclor 1260	µg/L	<2
Surrogate TCMX	%	78

Metals in Water - Dissolved		
Our Reference		309378-42
Your Reference	UNITS	FR-SPT-S1
Depth		-
Type of sample		Water
Date Sampled		27/10/2022
Date digested	-	03/11/2022
Date analysed	-	04/11/2022
Arsenic - Dissolved	mg/L	<0.05
Cadmium - Dissolved	mg/L	<0.01
Chromium - Dissolved	mg/L	<0.01
Copper - Dissolved	mg/L	<0.01
Lead - Dissolved	mg/L	<0.03
Mercury - Dissolved	mg/L	<0.0005
Nickel - Dissolved	mg/L	<0.02
Zinc - Dissolved	mg/L	<0.02

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. **NOTE** #1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF) **NOTE** #2 The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation = Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.
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-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.

Method ID	Methodology Summary
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
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.
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-9	309378-5
Date extracted	-			03/11/2022	1	03/11/2022	03/11/2022		03/11/2022	03/11/2022
Date analysed	-			07/11/2022	1	07/11/2022	07/11/2022		07/11/2022	07/11/2022
TRH C_6 - C_9	mg/kg	25	Org-023	<25	1	<25	<25	0	89	80
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	1	<25	<25	0	89	80
Benzene	mg/kg	0.2	Org-023	<0.2	1	<0.2	<0.2	0	93	89
Toluene	mg/kg	0.5	Org-023	<0.5	1	<0.5	<0.5	0	89	88
Ethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	88	88
m+p-xylene	mg/kg	2	Org-023	<2	1	<2	<2	0	88	88
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	92	90
Naphthalene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	94	1	87	91	4	90	94

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	38	03/11/2022	03/11/2022		[NT]	[NT]
Date analysed	-			[NT]	38	07/11/2022	07/11/2022		[NT]	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	[NT]	38	<25	<25	0	[NT]	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	[NT]	38	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	[NT]	38	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	[NT]	38	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	[NT]	38	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	[NT]	38	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-023	[NT]	38	<1	<1	0	[NT]	[NT]
Naphthalene	mg/kg	1	Org-023	[NT]	38	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	38	95	83	13	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	309378-5
Date extracted	-			03/11/2022	1	03/11/2022	03/11/2022		03/11/2022	03/11/2022
Date analysed	-			04/11/2022	1	04/11/2022	04/11/2022		04/11/2022	04/11/2022
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	1	<50	<50	0	102	99
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	1	<100	<100	0	88	90
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	1	110	170	43	74	106
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	1	<50	<50	0	102	99
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	1	120	180	40	88	90
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	1	150	240	46	74	106
Surrogate o-Terphenyl	%		Org-020	77	1	81	80	1	83	86

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	38	03/11/2022	03/11/2022		[NT]	[NT]
Date analysed	-			[NT]	38	04/11/2022	04/11/2022		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	38	<50	<50	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	38	<100	<100	0	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	38	<100	<100	0	[NT]	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	[NT]	38	<50	<50	0	[NT]	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	[NT]	38	<100	<100	0	[NT]	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	[NT]	38	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-020	[NT]	38	80	79	1	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	309378-5
Date extracted	-			03/11/2022	1	03/11/2022	03/11/2022		03/11/2022	03/11/2022
Date analysed	-			05/11/2022	1	05/11/2022	05/11/2022		05/11/2022	05/11/2022
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	82	71
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	73	61
Fluorene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	72	63
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	80	69
Anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	84	67
Pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	79	68
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	67	62
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	1	<0.05	<0.05	0	140	128
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	75	1	83	77	8	84	69

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	38	03/11/2022	03/11/2022		[NT]	[NT]
Date analysed	-			[NT]	38	05/11/2022	05/11/2022		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	38	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	38	<0.05	<0.05	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	38	81	81	0	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	309378-5
Date extracted	-			03/11/2022	1	03/11/2022	03/11/2022		03/11/2022	03/11/2022
Date analysed	-			05/11/2022	1	05/11/2022	05/11/2022		05/11/2022	05/11/2022
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	78	70
HCB	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	84	76
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	97	87
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	95	85
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	90	86
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	92	82
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	92	81
Endrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	82	80
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	86	78
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	74	76
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	73	1	77	71	8	76	64

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	38	03/11/2022	03/11/2022		[NT]	[NT]
Date analysed	-			[NT]	38	05/11/2022	05/11/2022		[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
HCB	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	38	74	74	0	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	309378-5
Date extracted	-			03/11/2022	1	03/11/2022	03/11/2022		03/11/2022	03/11/2022
Date analysed	-			05/11/2022	1	05/11/2022	05/11/2022		05/11/2022	05/11/2022
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	109	103
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	91	83
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	99	111
Malathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	108	124
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	108	106
Parathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	66	66
Bromophos-ethyl	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	102	125
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	73	1	77	71	8	76	64

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	38	03/11/2022	03/11/2022		[NT]	[NT]
Date analysed	-			[NT]	38	05/11/2022	05/11/2022		[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	38	74	74	0	[NT]	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	309378-5
Date extracted	-			03/11/2022	1	03/11/2022	03/11/2022		03/11/2022	03/11/2022
Date analysed	-			05/11/2022	1	05/11/2022	05/11/2022		05/11/2022	05/11/2022
Aroclor 1016	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	93	80
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	73	1	77	71	8	76	64

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	38	03/11/2022	03/11/2022		[NT]	[NT]
Date analysed	-			[NT]	38	05/11/2022	05/11/2022		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-021	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	[NT]	38	74	74	0	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	309378-5
Date prepared	-			04/11/2022	1	04/11/2022	04/11/2022		04/11/2022	04/11/2022
Date analysed	-			06/11/2022	1	06/11/2022	06/11/2022		06/11/2022	06/11/2022
Arsenic	mg/kg	4	Metals-020	<4	1	<4	<4	0	102	79
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	103	88
Chromium	mg/kg	1	Metals-020	<1	1	10	9	11	99	105
Copper	mg/kg	1	Metals-020	<1	1	24	34	34	98	97
Lead	mg/kg	1	Metals-020	<1	1	1	2	67	99	82
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	100	73
Nickel	mg/kg	1	Metals-020	<1	1	3	3	0	102	84
Zinc	mg/kg	1	Metals-020	<1	1	7	8	13	99	#

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	38	04/11/2022	04/11/2022		[NT]	[NT]
Date analysed	-			[NT]	38	06/11/2022	06/11/2022		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	38	<4	<4	0	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	38	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	38	29	25	15	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	38	16	17	6	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	38	17	14	19	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	38	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	38	7	6	15	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	38	28	27	4	[NT]	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			03/11/2022	[NT]	[NT]	[NT]	[NT]	03/11/2022	[NT]
Date analysed	-			07/11/2022	[NT]	[NT]	[NT]	[NT]	07/11/2022	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	105	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	105	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	104	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Naphthalene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	104	[NT]	[NT]	[NT]	[NT]	102	[NT]
Surrogate toluene-d8	%		Org-023	104	[NT]	[NT]	[NT]	[NT]	101	[NT]
Surrogate 4-BFB	%		Org-023	105	[NT]	[NT]	[NT]	[NT]	99	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			03/11/2022	[NT]	[NT]	[NT]	[NT]	03/11/2022	[NT]
Date analysed	-			04/11/2022	[NT]	[NT]	[NT]	[NT]	04/11/2022	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	82	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	103	[NT]
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	86	[NT]
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	82	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	103	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	86	[NT]
Surrogate o-Terphenyl	%		Org-020	104	[NT]	[NT]	[NT]	[NT]	82	[NT]

QUALITY CONTROL: PAHs in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	309378-42
Date extracted	-			03/11/2022	[NT]	[NT]	[NT]	[NT]	03/11/2022	03/11/2022
Date analysed	-			06/11/2022	[NT]	[NT]	[NT]	[NT]	06/11/2022	06/11/2022
Naphthalene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	88	74
Acenaphthylene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	89	85
Fluorene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	92	84
Phenanthrene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	100	86
Anthracene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	104	92
Pyrene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	99	87
Benzo(a)anthracene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	109	95
Benzo(b,j+k)fluoranthene	µg/L	2	Org-022/025	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	108	92
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	1	Org-022/025	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	122	[NT]	[NT]	[NT]	[NT]	99	80

QUALITY CONTROL: Organochlorine Pesticides in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	309378-42
Date extracted	-			03/11/2022	[NT]	[NT]	[NT]	[NT]	03/11/2022	03/11/2022
Date analysed	-			06/11/2022	[NT]	[NT]	[NT]	[NT]	06/11/2022	06/11/2022
alpha-BHC	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	98	86
HCB	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	96	85
gamma-BHC	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Heptachlor	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	79	69
delta-BHC	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	111	95
Heptachlor Epoxide	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	106	88
gamma-Chlordane	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-Chlordane	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	113	98
Dieldrin	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	122	98
Endrin	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	100	84
Endosulfan II	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDD	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	108	92
Endrin Aldehyde	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	80	68
Methoxychlor	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	103	[NT]	[NT]	[NT]	[NT]	90	75

QUALITY CONTROL: OP Pesticides in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	309378-42
Date extracted	-			03/11/2022	[NT]	[NT]	[NT]	[NT]	03/11/2022	03/11/2022
Date analysed	-			06/11/2022	[NT]	[NT]	[NT]	[NT]	06/11/2022	06/11/2022
Dichlorvos	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	107	103
Dimethoate	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Diazinon	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyriphos-methyl	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ronnel	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	87	73
Fenitrothion	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	87	71
Malathion	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	108	87
Chlorpyriphos	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	108	92
Parathion	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	89	74
Bromophos ethyl	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	113	92
Azinphos-methyl (Guthion)	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	103	[NT]	[NT]	[NT]	[NT]	90	75

QUALITY CONTROL: PCBs in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	309378-42
Date extracted	-			03/11/2022	[NT]	[NT]	[NT]	[NT]	03/11/2022	03/11/2022
Date analysed	-			06/11/2022	[NT]	[NT]	[NT]	[NT]	06/11/2022	06/11/2022
Aroclor 1016	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	107	90
Aroclor 1260	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-021	103	[NT]	[NT]	[NT]	[NT]	90	75

QUALITY CONTROL: Metals in Water - Dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date digested	-			03/11/2022	[NT]	[NT]	[NT]	[NT]	03/11/2022	[NT]
Date analysed	-			04/11/2022	[NT]	[NT]	[NT]	[NT]	04/11/2022	[NT]
Arsenic - Dissolved	mg/L	0.05	Metals-020	<0.05	[NT]	[NT]	[NT]	[NT]	87	[NT]
Cadmium - Dissolved	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	82	[NT]
Chromium - Dissolved	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	82	[NT]
Copper - Dissolved	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	81	[NT]
Lead - Dissolved	mg/L	0.03	Metals-020	<0.03	[NT]	[NT]	[NT]	[NT]	82	[NT]
Mercury - Dissolved	mg/L	0.0005	Metals-021	<0.0005	[NT]	[NT]	[NT]	[NT]	99	[NT]
Nickel - Dissolved	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	80	[NT]
Zinc - Dissolved	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	84	[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.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

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

TRH Water(C10-C40) NEPM - The positive result in the rinsate sample is due to a single peak with no hydrocarbon profile that is consistent with the use of plastic containers.
8 metals in soil - # Percent recovery is not possible to report due to the inhomogeneous nature of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.

Asbestos-ID in soil: NEPM
This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013. This is reported outside our scope of NATA accreditation.

Factual description of asbestos identified in the soil samples: NEPM
Sample 309378-7; Chrysotile and Amosite asbestos identified in 0.0785g of fibrous matted material

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SAMPLE RECEIPT ADVICE

Client Details

Client	JK Environments
Attention	Katrina Taylor

Sample Login Details

Your reference	E35521PT, Blayney
Envirolab Reference	309378
Date Sample Received	31/10/2022
Date Instructions Received	31/10/2022
Date Results Expected to be Reported	07/11/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	69 Soil, 1 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	16
Cooling Method	Ice
Sampling Date Provided	YES

Comments

#21 Depth - 1.0-1.2.

#70 Extra jar and bag sample.

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:

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Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBs in Soil	Acid Extractable metalsin soil	Asbestos ID - soils NEPM - ASB-001	vTRH(C6-C10)/BTEXN in Water	svTRH (C10-C40) in Water	PAHsin Water	Organochlorine Pesticides in Water	OP Pesticides in Water	PCBs in Water	Metals in Water - Dissolved	On Hold
BH1-0.05-0.2	✓	✓	✓	✓	✓	✓	✓	✓								
BH1-0.5-0.8																✓
BH1-1.5-1.7																✓
BH1-3.0-3.2																✓
BH3-0-0.1	✓	✓	✓	✓	✓	✓	✓									
BH3-0.12-0.4																✓
BH3-0.4-0.65								✓								
BH3-0.7-0.8																✓
BH3-1.4-1.5																✓
BH5-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓								
BH5-0.1-0.3																✓
BH5-0.5-0.7																✓
BH6-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓								
BH6-0.2-0.3																✓
BH6-0.5-0.7																✓
BH6-0.8-1.0																✓
BH10-0-0.2	✓	✓	✓	✓	✓	✓	✓	✓								
BH10-0.2-0.4																✓
BH12-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓								
BH12-0.5-0.7																✓
BH12-1.5-1.7																✓
BH14-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓								
BH14-0.3-0.5																✓
BH14-0.5-0.7																✓
BH14-1.0-1.1																✓
BH14-1.5-1.7																✓
BH15-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓								
BH15-0.1-0.3																✓
BH15-0.5-0.7																✓
BH17-0.05-0.2	✓	✓	✓	✓	✓	✓	✓	✓								
BH17-0.5-0.7																✓
BH20-0.05-0.2	✓	✓	✓	✓	✓	✓	✓									

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Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBs in Soil	Acid Extractable metalsin soil	Asbestos ID - soils NEPM - ASB-001	vTRH(C6-C10)/BTEXN in Water	svTRH (C10-C40) in Water	PAHsin Water	Organochlorine Pesticides in Water	OP Pesticides in Water	PCBs in Water	Metals in Water - Dissolved	On Hold
BH20-0.5-0.7								✓								
BH20-1.2-1.3																✓
BH20-1.5-1.7																✓
SDUP1																✓
SDUP2																✓
SDUP3	✓	✓	✓	✓	✓	✓	✓									
SDUP4																✓
TB-S1	✓	✓	✓	✓	✓	✓	✓									
TS-S1	✓															
FR-SPT-S1									✓	✓	✓	✓	✓	✓	✓	
BH2-0-0.12																✓
BH2-0.1-0.4																✓
BH2-0.5-0.7																✓
BH2-1.0-1.1																✓
BH4-0-0.1																✓
BH4-0.5-0.7																✓
BH7-0-0.2																✓
BH7-0.5-0.7																✓
BH7-1.0-1.1																✓
BH8-0-0.1																✓
BH8-0.5-0.6																✓
BH9-0-0.1																✓
BH9-0.4-0.5																✓
BH11-0.05-0.3																✓
BH11-0.5-0.7																✓
BH11-1.5-1.7																✓
BH13-0.05-0.5																✓
BH13-0.5-0.7																✓
BH13-1.5-1.7																✓
BH16-0.05-0.3																✓
BH16-0.5-0.7																✓
BH18-0.05-0.3																✓

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Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBs in Soil	Acid Extractable metalsin soil	Asbestos ID - soils NEPM - ASB-001	vTRH(C6-C10)/BTEXN in Water	svTRH (C10-C40) in Water	PAHsin Water	Organochlorine Pesticides in Water	OP Pesticides in Water	PCBs in Water	Metals in Water - Dissolved	On Hold
BH18-0.5-0.7																✓
BH18-1.1-1.3																✓
BH19-0.05-0.3																✓
BH19-0.5-0.7																✓
BH19-1.5-1.7																✓
BH11-1.0-1.2																✓

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.

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD 12 ASHLEY STREET CHATSWOOD NSW 2067 P: (02) 99106200 F: (02) 99106201 Attention: Aileen	JKE Job Number: E35521PT Date Results Required: STANDARD Page: 1 of 3	JKEnvironments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: Katrina Taylor ktaylor@jkenvironments.com.au

Location:	Blayney	Sample Preserved in Esky on Ice
Sampler:	HW	Tests Required

	Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	#6 - HM/TRH/BTEX	#3 - TRH/BTEXN/PA	Asbestos (WA 500mL method)	Asbestos (Detection)	BTEX							
	25/10/2022	1	BH1	0.05-0.2	G, A	0	F: Clayey Sand	X		X									
	25/10/2022	2	BH1	0.5-0.8	G, A	4	F: Gravelly Clayey Sand												
	25/10/2022	3	BH1	1.5-1.7	G, A	0	Clayey Silt												
	25/10/2022	4	BH1	3.0-3.2	G	3.1	Clayey Silt												
43	24/10/2022	NR	BH2	0-0.12	G, A	0.1	F: Silty Clay												
44	24/10/2022	NR	BH2	0.1-0.4	G, A	0.1	F: Silty Clay												
45	24/10/2022	NR	BH2	0.5-0.7	G, A	0.1	Silty Clay												
46	24/10/2022	NR	BH2	1.0-1.1	G, A	0	Silty Clay												
	24/10/2022	5	BH3	0-0.1	G, A	0	F: Silty Clay	X											
	24/10/2022	6	BH3	0.12-0.4	G, A	0	F: Silty Clay												
	24/10/2022	7	BH3	0.4-0.65	G, A	0.1	F: Silty Clay			X									
	24/10/2022	8	BH3	0.7-0.8	G, A	0	Silty Clay												
	24/10/2022	9	BH3	1.4-1.5	G, A	0	Silty Clay												
47	25/10/2022	NR	BH4	0-0.1	G, A	0.1	Silty Clay												
48	25/10/2022	NR	BH4	0.5-0.7	G, A	0	Silty Clay												
	24/10/2022	10	BH5	0-0.1	G, A	0	F: Silty Clay	X		X									
	24/10/2022	11	BH5	0.1-0.3	G, A	0	F: Silty Clay												
	24/10/2022	12	BH5	0.5-0.7	G, A	0	Silty Clay												
	25/10/2022	13	BH6	0-0.1	G, A	0	F: Silty Clay	X		X									
	25/10/2022	14	BH6	0.2-0.3	G, A	0	F: Silty Clay												
	25/10/2022	15	BH6	0.5-0.7	G, A	0	F: Silty Clay												
	25/10/2022	16	BH6	0.8-1.0	G, A	0	Silty Clay												
49	26/10/2022	NR	BH7	0-0.2	G, A	0	Silty Clay												
50	26/10/2022	NR	BH7	0.5-0.7	G, A	0	Silty Clay												
51	26/10/2022	NR	BH7	1.0-1.1	G	0	Silty Clay												

Remarks (comments/detection limits required):	Sample Containers: G - 250mg Glass Jar A - 500mL Ziplock Asbestos Bag

Relinquished By: KT	Date: 31 October 2022	Time: 15:30	Received By:- ELS: HTL	Date: 31/10/2022

ENVIROLAB

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

Job No: 307378

Date Received: 31/10/2022
Time Received: 15:30
Received By: HTL
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD 12 ASHLEY STREET CHATSWOOD NSW 2067 P: (02) 99106200 F: (02) 99106201 Attention: Aileen	JKE Job Number: E35521PT Date Results Required: STANDARD Page: 2 of 3	JKEnvironments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: Katrina Taylor ktaylor@jkenvironments.com.au

Location:	Blayney	Sample Preserved in Esky on Ice
Sampler:	HW	Tests Required

	Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	#6 - HM/TRH/BTEX #3 - TRH/BTEXN/PA	Asbestos (WA 500mL method)	Asbestos (Detection)	BTEX							
52	27/10/2022	NR	BH8	0-0.1	G, A	0	F: Silty Clay											
53	27/10/2022	NR	BH8	0.5-0.6	G, A	0	Silty Clay											
54	28/10/2022	NR	BH9	0-0.1	G, A	0	F: Silty Clay											
55	28/10/2022	NR	BH9	0.4-0.5	G, A	0	Silty Clay											
	28/10/2022	17	BH10	0-0.2	G, A	0	F: Silty Clay	X	X									
	28/10/2022	18	BH10	0.2-0.4	G, A	0	F: Silty Clay											
56	27/10/2022	NR	BH11	0.05-0.3	G, A	0	F: Sand											
57	27/10/2022	NR	BH11	0.5-0.7	G, A	0	F: Sand											
58	27/10/2022	NR	BH11	1.5-1.7	G, A	0	Silty Clay											
	26/10/2022	19	BH12	0-0.1	G, A	0.1	Silty Clay	X	X									
	26/10/2022	20	BH12	0.5-0.7	G, A	0.1	Silty Clay											
	26/10/2022	21	BH12	1.5-1.7 (1.0-1.2)	G	0	Silty Clay											
59	27/10/2022	NR	BH13	0.05-0.5	G, A	0.1	F: Sand											
60	27/10/2022	NR	BH13	0.5-0.7	G, A	0.2	Silty Clay											
61	27/10/2022	NR	BH13	1.5-1.7	G, A	0.2	Silty Clay											
	26/10/2022	22	BH14	0-0.1	G, A	0.2	F: Silty Clay	X	X									
	26/10/2022	23	BH14	0.3-0.5	G, A	0.3	F: Silty Clay											
	26/10/2022	24	BH14	0.5-0.7	G, A	3.7	Silty Clay											
	26/10/2022	25	BH14	1.0-1.1	G, A	0	Silty Clay											
	26/10/2022	26	BH14	1.5-1.7	G	0.1	Silty Clay											
	26/10/2022	27	BH15	0-0.1	G, A	0	F: Silty Clay	X	X									
	26/10/2022	28	BH15	0.1-0.3	G, A	0	F: Silty Clay											
	26/10/2022	29	BH15	0.5-0.7	G, A	0.4	Silty Clay											
62	27/10/2022	NR	BH16	0.05-0.3	G, A	0.1	F: Sand											
63	27/10/2022	NR	BH16	0.5-0.7	G, A	0.2	Silty Clay											

ENVIROLAB

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

Job no: 309378
Date Received: 31/10/2022
Time Received: 15:30
Received By: KTL
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Remarks (comments/detection limits required):

Sample Containers:
G - 250mg Glass Jar
A - 500mL Ziplock Asbestos Bag

Relinquished By: KT	Date: 31 October 2022	Time: 15:30	Received By: ELS KTL	Date: 31/10/2022

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD 12 ASHLEY STREET CHATSWOOD NSW 2067 P: (02) 99106200 F: (02) 99106201 Attention: Aileen	JKE Job Number: E35521PT Date Results Required: STANDARD Page: 3 of 3	JKEnvironments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: Katrina Taylor ktaylor@jkenvironments.com.au

Location:	Blayney	Sample Preserved in Esky on Ice
Sampler:	HW	Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	#6 - HM/TRH/BTEX	#3 - TRH/BTEXN/PA	Asbestos (WA 500mL method)	Asbestos (Detection)	BTEX							
25/10/2022	30	BH17	0.05-0.2	G, A	0	F: Clayey Sand	X		X									
25/10/2022	31	BH17	0.5-0.7	G, A	0.1	Silty Clay												
64 27/10/2022	NR	BH18	0.05-0.3	G, A	0	F: Sand												
65 27/10/2022	NR	BH18	0.5-0.7	G, A	0.6	F: Silty Clay												
66 27/10/2022	NR	BH18	1.1-1.3	G, A	0	Silty Clay												
67 25/10/2022	NR	BH19	0.05-0.3	G, A	0	F: Gravelly Sand												
68 25/10/2022	NR	BH19	0.5-0.7	G, A	1.1	Silty Clay												
69 25/10/2022	NR	BH19	1.5-1.7	G	0.2	Silty Clay												
25/10/2022	32	BH20	0.05-0.2	G, A	0	F: Clayey Sand	X											
25/10/2022	33	BH20	0.5-0.7	G, A	0.5	F: Gravelly Sand			X									
25/10/2022	34	BH20	1.2-1.3	G, A	3	Silty Clay												
25/10/2022	35	BH20	1.5-1.7	G	8.3	Silty Clay												
24/10/2022	36	SDUP1	-	G	NA	Soil duplicate												
25/10/2022	~~37~~	SDUP2	-	G	NA	Soil duplicate	X	Please send to melbourne Envirolab										
26/10/2022	38	SDUP3	-	G	NA	Soil duplicate	X											
27/10/2022	39	SDUP4	-	G	NA	Soil duplicate												
24-28/10/2022	40	TB-S1	-	G	NA	Soil blank	X											
24-28/10/2022	41	TS-S1	-	V	NA	Soil spike					X							
27/10/2022	42	FR-SPT-S1	-	2xG1, 2xV, H	NA	Water	X											
Extra	70	BH11	1.0-1.2															

Remarks (comments/detection limits required):	Sample Containers: G - 250mg Glass Jar V - BTEX Vial A - 500mL Ziplock Asbestos Bag H - HNO3 Preserved Plastic G1 - 500mL Glass Amber

Relinquished By: KT	Date: 31 October 2022	Time: 15:30	Received By: ECS/HTC	Date: 31/10/2022

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12 Ashley St
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(02) 9910 6200

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Date Received: 31/10/2022
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Received By: MYL
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

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 309378-A

Client Details

Client	JK Environments
Attention	Katrina Taylor
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E35521PT, Blayney**
Number of Samples	additional analysis
Date samples received	31/10/2022
Date completed instructions received	09/11/2022

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	16/11/2022
Date of Issue	16/11/2022

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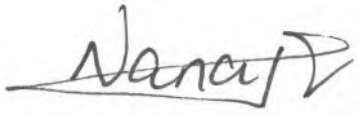
Results Approved By
Diego Bigolin, Inorganics Supervisor
Giovanni Agosti, Group Technical Manager
Josh Williams, Organics and LC Supervisor
Nancy Zhang, Laboratory Manager, Sydney

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil					
Our Reference		309378-A-2	309378-A-7	309378-A-12	309378-A-33
Your Reference	UNITS	BH1	BH3	BH5	BH20
Depth		0.5-0.8	0.4-0.65	0.5-0.7	0.5-0.7
Type of sample		Soil	Soil	Soil	Soil
Date Sampled		25/10/2022	24/10/2022	24/10/2022	25/10/2022
Date extracted	-	10/11/2022	10/11/2022	10/11/2022	10/11/2022
Date analysed	-	11/11/2022	11/11/2022	11/11/2022	11/11/2022
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	88	113	106	110

svTRH (C10-C40) in Soil					
Our Reference		309378-A-2	309378-A-7	309378-A-12	309378-A-33
Your Reference	UNITS	BH1	BH3	BH5	BH20
Depth		0.5-0.8	0.4-0.65	0.5-0.7	0.5-0.7
Type of sample		Soil	Soil	Soil	Soil
Date Sampled		25/10/2022	24/10/2022	24/10/2022	25/10/2022
Date extracted	-	10/11/2022	10/11/2022	10/11/2022	10/11/2022
Date analysed	-	12/11/2022	12/11/2022	13/11/2022	13/11/2022
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50
Surrogate o-Terphenyl	%	82	81	81	81

PAHs in Soil					
Our Reference		309378-A-2	309378-A-7	309378-A-12	309378-A-33
Your Reference	UNITS	BH1	BH3	BH5	BH20
Depth		0.5-0.8	0.4-0.65	0.5-0.7	0.5-0.7
Type of sample		Soil	Soil	Soil	Soil
Date Sampled		25/10/2022	24/10/2022	24/10/2022	25/10/2022
Date extracted	-	11/11/2022	11/11/2022	11/11/2022	11/11/2022
Date analysed	-	14/11/2022	14/11/2022	14/11/2022	14/11/2022
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	68	68	69	65

Acid Extractable metals in soil					
Our Reference		309378-A-2	309378-A-7	309378-A-12	309378-A-33
Your Reference	UNITS	BH1	BH3	BH5	BH20
Depth		0.5-0.8	0.4-0.65	0.5-0.7	0.5-0.7
Type of sample		Soil	Soil	Soil	Soil
Date Sampled		25/10/2022	24/10/2022	24/10/2022	25/10/2022
Date prepared	-	11/11/2022	11/11/2022	11/11/2022	11/11/2022
Date analysed	-	14/11/2022	14/11/2022	14/11/2022	14/11/2022
Arsenic	mg/kg	<4	17	<4	12
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	270	30	19	360
Copper	mg/kg	41	42	12	86
Lead	mg/kg	2	260	10	2
Mercury	mg/kg	<0.1	0.1	0.2	<0.1
Nickel	mg/kg	220	15	6	310
Zinc	mg/kg	15	180	32	13

Moisture					
Our Reference		309378-A-2	309378-A-7	309378-A-12	309378-A-33
Your Reference	UNITS	BH1	BH3	BH5	BH20
Depth		0.5-0.8	0.4-0.65	0.5-0.7	0.5-0.7
Type of sample		Soil	Soil	Soil	Soil
Date Sampled		25/10/2022	24/10/2022	24/10/2022	25/10/2022
Date prepared	-	10/11/2022	10/11/2022	10/11/2022	10/11/2022
Date analysed	-	11/11/2022	11/11/2022	11/11/2022	11/11/2022
Moisture	%	7.9	13	11	11

Misc Inorg - Soil		
Our Reference		309378-A-10
Your Reference	UNITS	BH5
Depth		0-0.1
Type of sample		Soil
Date Sampled		24/10/2022
Date prepared	-	15/11/2022
Date analysed	-	15/11/2022
pH 1:5 soil:water	pH Units	6.6

CEC		
Our Reference		309378-A-10
Your Reference	UNITS	BH5
Depth		0-0.1
Type of sample		Soil
Date Sampled		24/10/2022
Date prepared	-	16/11/2022
Date analysed	-	16/11/2022
Exchangeable Ca	meq/100g	10
Exchangeable K	meq/100g	0.9
Exchangeable Mg	meq/100g	1.6
Exchangeable Na	meq/100g	<0.1
Cation Exchange Capacity	meq/100g	13

Method ID	Methodology Summary
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
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-020	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-OES analytical finish.
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-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
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.

Method ID	Methodology Summary
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-7	[NT]
Date extracted	-			10/11/2022	[NT]	[NT]	[NT]	[NT]	10/11/2022	[NT]
Date analysed	-			14/11/2022	[NT]	[NT]	[NT]	[NT]	11/11/2022	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	100	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	100	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	[NT]	[NT]	[NT]	[NT]	100	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	[NT]	[NT]	[NT]	[NT]	103	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	99	[NT]
o-Xylene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Naphthalene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	109	[NT]	[NT]	[NT]	[NT]	108	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	[NT]
Date extracted	-			10/11/2022	[NT]	[NT]	[NT]	[NT]	10/11/2022	[NT]
Date analysed	-			12/11/2022	[NT]	[NT]	[NT]	[NT]	12/11/2022	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	112	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	95	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	129	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	112	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	95	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	129	[NT]
Surrogate o-Terphenyl	%		Org-020	80	[NT]	[NT]	[NT]	[NT]	88	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	[NT]
Date extracted	-			11/11/2022	[NT]	[NT]	[NT]	[NT]	11/11/2022	[NT]
Date analysed	-			14/11/2022	[NT]	[NT]	[NT]	[NT]	14/11/2022	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	86	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	77	[NT]
Fluorene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	76	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	80	[NT]
Anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	76	[NT]
Pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	77	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	71	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	[NT]	[NT]	[NT]	[NT]	122	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	74	[NT]	[NT]	[NT]	[NT]	78	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date prepared	-			11/11/2022	[NT]	[NT]	[NT]	[NT]	11/11/2022	[NT]
Date analysed	-			14/11/2022	[NT]	[NT]	[NT]	[NT]	14/11/2022	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	99	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	110	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	112	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	113	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	112	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	[NT]
Date prepared	-			15/11/2022	10	15/11/2022	15/11/2022		15/11/2022	[NT]
Date analysed	-			15/11/2022	10	15/11/2022	15/11/2022		15/11/2022	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	10	6.6	6.7	2	100	[NT]

QUALITY CONTROL: CEC						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			16/11/2022	10	16/11/2022	16/11/2022		16/11/2022	[NT]
Date analysed	-			16/11/2022	10	16/11/2022	16/11/2022		16/11/2022	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	10	10	9.6	4	106	[NT]
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	10	0.9	0.9	0	100	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	10	1.6	1.6	0	106	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	10	<0.1	<0.1	0	110	[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.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

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

Samples were out of the recommended holding time for this analysis pH in soil.

Envirolab Services Pty Ltd
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www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	JK Environments
Attention	Katrina Taylor

Sample Login Details

Your reference	E35521PT, Blayney
Envirolab Reference	309378-A
Date Sample Received	31/10/2022
Date Instructions Received	09/11/2022
Date Results Expected to be Reported	16/11/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	additional analysis
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	16
Cooling Method	Ice
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:

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Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Acid Extractable metalsin soil	Misc Inorg - Soil	CEC	On Hold
BH1-0.05-0.2							✓
BH1-0.5-0.8	✓	✓	✓	✓			
BH1-1.5-1.7							✓
BH1-3.0-3.2							✓
BH3-0-0.1							✓
BH3-0.12-0.4							✓
BH3-0.4-0.65	✓	✓	✓	✓			
BH3-0.7-0.8							✓
BH3-1.4-1.5							✓
BH5-0-0.1					✓	✓	
BH5-0.1-0.3							✓
BH5-0.5-0.7	✓	✓	✓	✓			
BH6-0-0.1							✓
BH6-0.2-0.3							✓
BH6-0.5-0.7							✓
BH6-0.8-1.0							✓
BH10-0-0.2							✓
BH10-0.2-0.4							✓
BH12-0-0.1							✓
BH12-0.5-0.7							✓
BH12-1.5-1.7							✓
BH14-0-0.1							✓
BH14-0.3-0.5							✓
BH14-0.5-0.7							✓
BH14-1.0-1.1							✓
BH14-1.5-1.7							✓
BH15-0-0.1							✓
BH15-0.1-0.3							✓
BH15-0.5-0.7							✓
BH17-0.05-0.2							✓
BH17-0.5-0.7							✓
BH20-0.05-0.2							✓

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Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Acid Extractable metalsin soil	Misc Inorg - Soil	CEC	On Hold
BH20-0.5-0.7	✓	✓	✓	✓			
BH20-1.2-1.3							✓
BH20-1.5-1.7							✓
SDUP1							✓
SDUP2							✓
SDUP3							✓
SDUP4							✓
TB-S1							✓
TS-S1							✓
FR-SPT-S1							✓
BH2-0-0.12							✓
BH2-0.1-0.4							✓
BH2-0.5-0.7							✓
BH2-1.0-1.1							✓
BH4-0-0.1							✓
BH4-0.5-0.7							✓
BH7-0-0.2							✓
BH7-0.5-0.7							✓
BH7-1.0-1.1							✓
BH8-0-0.1							✓
BH8-0.5-0.6							✓
BH9-0-0.1							✓
BH9-0.4-0.5							✓
BH11-0.05-0.3							✓
BH11-0.5-0.7							✓
BH11-1.5-1.7							✓
BH13-0.05-0.5							✓
BH13-0.5-0.7							✓
BH13-1.5-1.7							✓
BH16-0.05-0.3							✓
BH16-0.5-0.7							✓
BH18-0.05-0.3							✓

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Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Acid Extractable metalsin soil	Misc Inorg - Soil	CEC	On Hold
BH18-0.5-0.7							✓
BH18-1.1-1.3							✓
BH19-0.05-0.3							✓
BH19-0.5-0.7							✓
BH19-1.5-1.7							✓
BH11-1.0-1.2							✓

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.

Ming To

From: Katrina Taylor <KTaylor@jkenvironments.com.au>
Sent: Wednesday, 9 November 2022 2:08 PM
To: Samplereceipt
Subject: FW: Results for Registration 309378 E35521PT, Blayney
Attachments: 309378-[R00].pdf; 309378-COC.pdf; JK Environment Soil for Envirolab 309378.xlsx; 309378.Excel.xlsx

Ref: 309378-A
TAT: Standard.
Due: 16/11/2022
MT.

Afternoon,

Please schedule the following on standard TA:

pH & CEC
BH5 (0-0.1) 10

#3
BH1 (0.5-0.8) 2
BH3 (0.4-0.65) 7
BH5 (0.5-0.7) 12
BH20 (0.5-0.7) 33

Thank you.

Regards
Katrina Taylor
Associate | Environmental Scientist
NSW Licensed Asbestos Assessor

T: +612 9888 5000
D: 0418 481 628
E: KTaylor@jkenvironments.com.au
www.jkenvironments.com.au

PO Box 976
NORTH RYDE BC NSW 1670
115 Wicks Road
MACQUARIE PARK NSW 2113

JKEnvironments

From: Greta Petzold <GPetzold@envirolab.com.au>
Sent: Monday, 7 November 2022 6:16 PM
To: Katrina Taylor <KTaylor@jkenvironments.com.au>
Subject: Results for Registration 309378 E35521PT, Blayney

Please refer to attached for:
a copy of the Certificate of Analysis
a copy of the COC/paperwork received from you
an Excel or .csv file containing the results

Please note that a hard copy will not be posted.

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CERTIFICATE OF ANALYSIS 309378-B

Client Details

Client	JK Environments
Attention	Katrina Taylor
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E35521PT, Blayney**
Number of Samples	additional analysis
Date samples received	31/10/2022
Date completed instructions received	16/11/2022

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

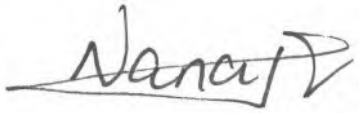
Date results requested by	23/11/2022
Date of Issue	23/11/2022

NATA Accreditation Number 2901. This document shall not be reproduced except in full.

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

Results Approved By
Diego Bigolin, Inorganics Supervisor
Giovanni Agosti, Group Technical Manager

Authorised By



Nancy Zhang, Laboratory Manager

CEC			
Our Reference		309378-B-2	309378-B-33
Your Reference	UNITS	BH1	BH20
Depth		0.5-0.8	0.5-0.7
Type of sample		Soil	Soil
Date Sampled		25/10/2022	25/10/2022
Date prepared	-	23/11/2022	23/11/2022
Date analysed	-	23/11/2022	23/11/2022
Exchangeable Ca	meq/100g	14	17
Exchangeable K	meq/100g	0.3	0.5
Exchangeable Mg	meq/100g	13	14
Exchangeable Na	meq/100g	0.1	<0.1
Cation Exchange Capacity	meq/100g	28	32

Clay 50-120g			
Our Reference		309378-B-2	309378-B-33
Your Reference	UNITS	BH1	BH20
Depth		0.5-0.8	0.5-0.7
Type of sample		Soil	Soil
Date Sampled		25/10/2022	25/10/2022
Date prepared	-	17/11/2022	17/11/2022
Date analysed	-	18/11/2022	18/11/2022
Clay in soils <2µm	% (w/w)	8	7

Metals from Leaching Fluid pH 2.9 or 5				
Our Reference		309378-B-2	309378-B-7	309378-B-33
Your Reference	UNITS	BH1	BH3	BH20
Depth		0.5-0.8	0.4-0.65	0.5-0.7
Type of sample		Soil	Soil	Soil
Date Sampled		25/10/2022	24/10/2022	25/10/2022
Date extracted	-	22/11/2022	22/11/2022	22/11/2022
Date analysed	-	22/11/2022	22/11/2022	22/11/2022
pH of soil for fluid# determ.	pH units	6.1	6.5	6.3
pH of soil TCLP (after HCl)	pH units	1.7	1.7	1.7
Extraction fluid used		1	1	1
pH of final Leachate	pH units	5.0	5.1	4.9
Chromium	mg/L	<0.01	[NA]	<0.01
Lead	mg/L	[NA]	0.08	[NA]
Nickel	mg/L	0.05	[NA]	0.06

Method ID	Methodology Summary
AS1289.3.6.3	Particle Size Distribution using in house method INORG-107 by way of sieving and/or hydrometer sedimentation testing. Clay fraction at <2µm reported.
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using AS 4439 and USEPA 1311. Please note that the mass used may be scaled down from default based on sample mass available. Samples are stored at 2-6oC before and after leachate preparation.
Metals-020	Determination of various metals by ICP-AES following buffer determination as per USEPA 1311 and hence AS 4439.3. Extraction Fluid 1 refers to the pH 5.0 buffer and Extraction Fluid 2 is the pH 2.9 buffer.
Metals-020	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-OES analytical finish.

QUALITY CONTROL: CEC					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			23/11/2022	[NT]	[NT]	[NT]	[NT]	23/11/2022	[NT]
Date analysed	-			23/11/2022	[NT]	[NT]	[NT]	[NT]	23/11/2022	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]

QUALITY CONTROL: Metals from Leaching Fluid pH 2.9 or 5					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			22/11/2022	[NT]	[NT]	[NT]	[NT]	22/11/2022	[NT]
Date analysed	-			22/11/2022	[NT]	[NT]	[NT]	[NT]	22/11/2022	[NT]
Chromium	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	100	[NT]
Lead	mg/L	0.03	Metals-020	<0.03	[NT]	[NT]	[NT]	[NT]	98	[NT]
Nickel	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	100	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
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RPD	Relative Percent Difference
LCS	Laboratory Control Sample
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Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

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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.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

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Attention	Katrina Taylor

Sample Login Details

Your reference	E35521PT, Blayney
Envirolab Reference	309378-B
Date Sample Received	31/10/2022
Date Instructions Received	16/11/2022
Date Results Expected to be Reported	23/11/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	additional analysis
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	16
Cooling Method	Ice
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:

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Sample ID	CEC	Clay 50-120g	pH of soil for fluid#determ.	pH of soil TCLP (after HCl)	Extraction fluid used	pH of final Leachate	Chromium	Lead	Nickel	On Hold
BH1-0.05-0.2										✓
BH1-0.5-0.8	✓	✓	✓	✓	✓	✓	✓		✓	
BH1-1.5-1.7										✓
BH1-3.0-3.2										✓
BH3-0-0.1										✓
BH3-0.12-0.4										✓
BH3-0.4-0.65			✓	✓	✓	✓		✓		
BH3-0.7-0.8										✓
BH3-1.4-1.5										✓
BH5-0-0.1										✓
BH5-0.1-0.3										✓
BH5-0.5-0.7										✓
BH6-0-0.1										✓
BH6-0.2-0.3										✓
BH6-0.5-0.7										✓
BH6-0.8-1.0										✓
BH10-0-0.2										✓
BH10-0.2-0.4										✓
BH12-0-0.1										✓
BH12-0.5-0.7										✓
BH12-1.5-1.7										✓
BH14-0-0.1										✓
BH14-0.3-0.5										✓
BH14-0.5-0.7										✓
BH14-1.0-1.1										✓
BH14-1.5-1.7										✓
BH15-0-0.1										✓
BH15-0.1-0.3										✓
BH15-0.5-0.7										✓
BH17-0.05-0.2										✓
BH17-0.5-0.7										✓
BH20-0.05-0.2										✓

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Sample ID	CEC	Clay 50-120g	pH of soil for fluid#determ.	pH of soil TCLP (after HCl)	Extraction fluid used	pH of final Leachate	Chromium	Lead	Nickel	On Hold
BH20-0.5-0.7	✓	✓	✓	✓	✓	✓	✓		✓	
BH20-1.2-1.3										✓
BH20-1.5-1.7										✓
SDUP1										✓
SDUP2										✓
SDUP3										✓
SDUP4										✓
TB-S1										✓
TS-S1										✓
FR-SPT-S1										✓
BH2-0-0.12										✓
BH2-0.1-0.4										✓
BH2-0.5-0.7										✓
BH2-1.0-1.1										✓
BH4-0-0.1										✓
BH4-0.5-0.7										✓
BH7-0-0.2										✓
BH7-0.5-0.7										✓
BH7-1.0-1.1										✓
BH8-0-0.1										✓
BH8-0.5-0.6										✓
BH9-0-0.1										✓
BH9-0.4-0.5										✓
BH11-0.05-0.3										✓
BH11-0.5-0.7										✓
BH11-1.5-1.7										✓
BH13-0.05-0.5										✓
BH13-0.5-0.7										✓
BH13-1.5-1.7										✓
BH16-0.05-0.3										✓
BH16-0.5-0.7										✓
BH18-0.05-0.3										✓

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Sample ID	CEC	Clay 50-120g	pH of soil for fluid#determ.	pH of soil TCLP (after HCl)	Extraction fluid used	pH of final Leachate	Chromium	Lead	Nickel	On Hold
BH18-0.5-0.7										✓
BH18-1.1-1.3										✓
BH19-0.05-0.3										✓
BH19-0.5-0.7										✓
BH19-1.5-1.7										✓
BH11-1.0-1.2										✓

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.

Ming To

From: Katrina Taylor <KTaylor@jkenvironments.com.au>
Sent: Wednesday, 16 November 2022 5:30 PM
To: Samplereceipt
Subject: RE: Results for Registration 309378-A E35521PT, Blayney

Ref: 309378-B
TAT: Standard.
Due: 23/11/2022
MT

Afternoon,

Please run the following analysis on standard TA:

CEC & % clay content
BH1 (0.5-0.8) 2
BH20 (0.5-0.7) 33

TCLP Chromium & Nickel
BH1 (0.5-0.8) 2
BH20 (0.5-0.7) 33.

TCLP Lead
BH3 (0.4-0.65) 7

Thank you.

Regards
Katrina Taylor
Associate | Environmental Scientist
NSW Licensed Asbestos Assessor

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PO Box 976
NORTH RYDE BC NSW 1670
115 Wicks Road
MACQUARIE PARK NSW 2113

JKEnvironments

From: Greta Petzold <GPetzold@envirolab.com.au>
Sent: Wednesday, 16 November 2022 3:06 PM
To: Katrina Taylor <KTaylor@jkenvironments.com.au>
Subject: Results for Registration 309378-A E35521PT, Blayney

Please refer to attached for:
a copy of the Certificate of Analysis
a copy of the COC/paperwork received from you
an Excel or .csv file containing the results

Please note that a hard copy will not be posted.

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

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ph 03 9763 2500 fax 03 9763 2633
melbourne@envirolab.com.au
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CERTIFICATE OF ANALYSIS 34326

Client Details

Client	JK Environments
Attention	Katrina Taylor
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E35521PT**
Number of Samples	1 Soil
Date samples received	02/11/2022
Date completed instructions received	02/11/2022

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	08/11/2022
Date of Issue	07/11/2022

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

Results Approved By
Tara White, Metals Team Leader
Tianna Milburn, Chemist

Authorised By

Pamela Adams, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		34326-1
Your Reference	UNITS	SDUP2
Date Sampled		25/10/2022
Type of sample		Soil
Date extracted	-	03/11/2022
Date analysed	-	03/11/2022
vTRH C_6 - C_9	mg/kg	<25
vTRH C_6 - C_{10}	mg/kg	<25
TRH 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 BTEX	mg/kg	<1
Total +ve Xylenes	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	85

TRH Soil C10-C40 NEPM		
Our Reference		34326-1
Your Reference	UNITS	SDUP2
Date Sampled		25/10/2022
Type of sample		Soil
Date extracted	-	03/11/2022
Date analysed	-	03/11/2022
TRH C_{10} - C_{14}	mg/kg	<50
TRH C_{15} - C_{28}	mg/kg	<100
TRH C_{29} - C_{36}	mg/kg	310
Total +ve TRH (C10-C36)	mg/kg	310
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	250
TRH >C_{34} -C_{40}	mg/kg	440
Total +ve TRH (>C10-C40)	mg/kg	690
Surrogate o-Terphenyl	%	91

PAHs in Soil		
Our Reference		34326-1
Your Reference	UNITS	SDUP2
Date Sampled		25/10/2022
Type of sample		Soil
Date extracted	-	03/11/2022
Date analysed	-	04/11/2022
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b,j&k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Total +ve PAH's	mg/kg	<0.05
Benzo(a)pyrene TEQ calc (Zero)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc (Half)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc (PQL)	mg/kg	<0.5
Surrogate p-Terphenyl-d_{14}	%	92

OCP in Soil		
Our Reference		34326-1
Your Reference	UNITS	SDUP2
Date Sampled		25/10/2022
Type of sample		Soil
Date extracted	-	03/11/2022
Date analysed	-	04/11/2022
alpha-BHC	mg/kg	<0.1
Hexachlorobenzene	mg/kg	<0.1
beta-BHC	mg/kg	<0.1
gamma-BHC	mg/kg	<0.1
Heptachlor	mg/kg	<0.1
delta-BHC	mg/kg	<0.1
Aldrin	mg/kg	<0.1
Heptachlor Epoxide	mg/kg	<0.1
gamma-Chlordane	mg/kg	<0.1
alpha-chlordane	mg/kg	<0.1
Endosulfan I	mg/kg	<0.1
pp-DDE	mg/kg	<0.1
Dieldrin	mg/kg	<0.1
Endrin	mg/kg	<0.1
Endosulfan II	mg/kg	<0.1
pp-DDD	mg/kg	<0.1
Endrin Aldehyde	mg/kg	<0.1
pp-DDT	mg/kg	<0.1
Endosulfan Sulphate	mg/kg	<0.1
Methoxychlor	mg/kg	<0.1
Total +ve reported Aldrin + Dieldrin	mg/kg	<0.1
Total +ve reported DDT+DDD+DDE	mg/kg	<0.1
Surrogate 2-chlorophenol-d4	%	74

OP in Soil		
Our Reference		34326-1
Your Reference	UNITS	SDUP2
Date Sampled		25/10/2022
Type of sample		Soil
Date extracted	-	03/11/2022
Date analysed	-	04/11/2022
Azinphos-methyl	mg/kg	<0.1
Bromophos-ethyl	mg/kg	<0.1
Chlorpyrifos	mg/kg	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1
Diazinon	mg/kg	<0.1
Dichlorovos	mg/kg	<0.1
Dimethoate	mg/kg	<0.1
Ethion	mg/kg	<0.1
Fenitrothion	mg/kg	<0.1
Malathion	mg/kg	<0.1
Parathion	mg/kg	<0.1
Ronnel	mg/kg	<0.1
Surrogate 2-chlorophenol-d4	%	74

PCBs in Soil		
Our Reference		34326-1
Your Reference	UNITS	SDUP2
Date Sampled		25/10/2022
Type of sample		Soil
Date extracted	-	03/11/2022
Date analysed	-	04/11/2022
Aroclor 1016	mg/kg	<0.1
Aroclor 1221	mg/kg	<0.1
Aroclor 1232	mg/kg	<0.1
Aroclor 1242	mg/kg	<0.1
Aroclor 1248	mg/kg	<0.1
Aroclor 1254	mg/kg	<0.1
Aroclor 1260	mg/kg	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1
Surrogate 2-fluorobiphenyl	%	76

Acid Extractable metals in soil		
Our Reference		34326-1
Your Reference	UNITS	SDUP2
Date Sampled		25/10/2022
Type of sample		Soil
Date digested	-	03/11/2022
Date analysed	-	04/11/2022
Arsenic	mg/kg	<4
Cadmium	mg/kg	<0.4
Chromium	mg/kg	24
Copper	mg/kg	46
Lead	mg/kg	2
Mercury	mg/kg	<0.1
Nickel	mg/kg	5
Zinc	mg/kg	10

Moisture		
Our Reference		34326-1
Your Reference	UNITS	SDUP2
Date Sampled		25/10/2022
Type of sample		Soil
Date prepared	-	03/11/2022
Date analysed	-	04/11/2022
Moisture	%	8.8

Method ID	Methodology Summary
Inorg-008	Moisture content determined by heating at 105°C for a minimum of 12 hours.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	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. 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-021/022	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD or GC-MS. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
Org-022	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Note, For OCs the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.

Method ID	Methodology Summary
Org-022	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-022	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
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. 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	-			03/11/2022	[NT]	[NT]	[NT]	[NT]	03/11/2022	[NT]
Date analysed	-			03/11/2022	[NT]	[NT]	[NT]	[NT]	03/11/2022	[NT]
vTRH C_6 - C_9	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	98	[NT]
vTRH C_6 - C_{10}	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	98	[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]	103	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	94	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	95	[NT]
o-Xylene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	89	[NT]
Naphthalene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	93	[NT]	[NT]	[NT]	[NT]	87	[NT]

QUALITY CONTROL: TRH Soil C10-C40 NEPM						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			03/11/2022	1	03/11/2022	03/11/2022		03/11/2022	[NT]
Date analysed	-			03/11/2022	1	03/11/2022	04/11/2022		03/11/2022	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	1	<50	<50	0	97	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	1	<100	<100	0	104	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	1	310	280	10	104	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	1	<50	<50	0	97	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	1	250	230	8	104	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	1	440	440	0	104	[NT]
Surrogate o-Terphenyl	%		Org-020	92	1	91	87	4	80	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			03/11/2022	1	03/11/2022	03/11/2022		03/11/2022	[NT]
Date analysed	-			04/11/2022	1	04/11/2022	04/11/2022		04/11/2022	[NT]
Naphthalene	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	104	[NT]
Acenaphthylene	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	108	[NT]
Fluorene	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	102	[NT]
Phenanthrene	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	106	[NT]
Anthracene	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	114	[NT]
Pyrene	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	116	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	104	[NT]
Benzo(b,j&k)fluoranthene	mg/kg	0.2	Org-022	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022	<0.05	1	<0.05	<0.05	0	122	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d_{14}	%		Org-022	94	1	92	98	6	96	[NT]

QUALITY CONTROL: OCP in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			03/11/2022	[NT]	[NT]	[NT]	[NT]	03/11/2022	[NT]
Date analysed	-			04/11/2022	[NT]	[NT]	[NT]	[NT]	04/11/2022	[NT]
alpha-BHC	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Hexachlorobenzene	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	86	[NT]
gamma-BHC	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	82	[NT]
delta-BHC	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
alpha-chlordane	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	114	[NT]
Dieldrin	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Endrin	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	138	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	130	[NT]
Methoxychlor	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 2-chlorophenol-d4	%		Org-022	76	[NT]	[NT]	[NT]	[NT]	80	[NT]

QUALITY CONTROL: OP in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	34326-1
Date extracted	-			03/11/2022	1	03/11/2022	03/11/2022		03/11/2022	03/11/2022
Date analysed	-			04/11/2022	1	04/11/2022	04/11/2022		04/11/2022	04/11/2022
Azinphos-methyl	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	108	114
Chlorpyrifos-methyl	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	110	108
Diazinon	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	112	120
Dichlorovos	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	138	137
Fenitrothion	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	134	125
Malathion	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate 2-chlorophenol-d4	%		Org-022	76	1	74	78	5	80	82

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			03/11/2022	[NT]	[NT]	[NT]	[NT]	03/11/2022	[NT]
Date analysed	-			04/11/2022	[NT]	[NT]	[NT]	[NT]	04/11/2022	[NT]
Aroclor 1016	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	119	[NT]
Aroclor 1260	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 2-fluorobiphenyl	%		Org-022	80	[NT]	[NT]	[NT]	[NT]	84	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date digested	-			03/11/2022	[NT]	[NT]	[NT]	[NT]	03/11/2022	[NT]
Date analysed	-			04/11/2022	[NT]	[NT]	[NT]	[NT]	04/11/2022	[NT]
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	[NT]	[NT]	[NT]	[NT]	100	[NT]
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	[NT]	[NT]	[NT]	[NT]	97	[NT]
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Copper	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Lead	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	100	[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.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

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.

Envirolab Services Pty Ltd
ABN 37 112 535 645 - 002
25 Research Drive Croydon South VIC 3136
ph 03 9763 2500 fax 03 9763 2633
melbourne@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	JK Environments
Attention	Katrina Taylor

Sample Login Details

Your reference	E35521PT
Envirolab Reference	34326
Date Sample Received	02/11/2022
Date Instructions Received	02/11/2022
Date Results Expected to be Reported	08/11/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	1 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	13.7
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Pamela Adams	Chris De Luca
Phone: 03 9763 2500	**Phone: 03 9763 2500**
Fax: 03 9763 2633	**Fax: 03 9763 2633**
Email: padams@envirolab.com.au	**Email: cdeluca@envirolab.com.au**

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
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Sample ID	vTRH(C6-C10)/BTEXN in Soil	TRH Soil C10-C40 NEPM	PAHs in Soil	OCP in Soil	OP in Soil	PCBsin Soil	Acid Extractable metalsin soil
SDUP2	✓	✓	✓	✓	✓	✓	✓

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.

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD 12 ASHLEY STREET CHATSWOOD NSW 2067 P: (02) 99106200 F: (02) 99106201 Attention: Aileen	JKE Job Number: E35521PT Date Results Required: STANDARD Page: 3 of 3	JKEnvironments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: Katrina Taylor ktaylor@jkenvironments.com.au

Location:	Blayney	Sample Preserved in Esky on Ice
Sampler:	HW	Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	#6 - HM/TRH/BTEX	#3 - TRH/BTEXN/PA	Asbestos (WA 500mL method)	Asbestos (Detection)	BTEX							
25/10/2022	30	BH17	0.05-0.2	G, A	0	F: Clayey Sand	X		X									
25/10/2022	31	BH17	0.5-0.7	G, A	0.1	Silty Clay												
27/10/2022	NR	BH18	0.05-0.3	G, A	0	F: Sand												
27/10/2022	NR	BH18	0.5-0.7	G, A	0.6	F: Silty Clay												
27/10/2022	NR	BH18	1.1-1.3	G, A	0	Silty Clay												
25/10/2022	NR	BH19	0.05-0.3	G, A	0	F: Gravelly Sand												
25/10/2022	NR	BH19	0.5-0.7	G, A	1.1	Silty Clay												
25/10/2022	NR	BH19	1.5-1.7	G	0.2	Silty Clay												
25/10/2022	32	BH20	0.05-0.2	G, A	0	F: Clayey Sand	X											
25/10/2022	33	BH20	0.5-0.7	G, A	0.5	F: Gravelly Sand			X									
25/10/2022	34	BH20	1.2-1.3	G, A	3	Silty Clay												
25/10/2022	35	BH20	1.5-1.7	G	8.3	Silty Clay												
24/10/2022	36	SDUP1	-	G	NA	Soil duplicate												
25/10/2022	37	SDUP2		G	NA	Soil duplicate	X	Please send to melbourne Envirolab										
26/10/2022	38	SDUP3	-	G	NA	Soil duplicate	X											
27/10/2022	39	SDUP4	-	G	NA	Soil duplicate												
24-28/10/2022	40	TB-S1	-	G	NA	Soil blank	X											
24-28/10/2022	41	TS-S1	-	V	NA	Soil spike					X							
27/10/2022	42	FR-SPT-S1	-	2xG1, 2xV, H	NA	Water	X											

(1)

Envirolab Services 2 Ashley St Chatswood NSW 2067 Ph: (02) 9910 6200

Job No: 34826

Date Received: 31/10/22

Time Received: 12:30

Received By: MYL

Temp: Cool/Ambient

Cooling: Ice/Icepack

Security: Broken/None

13.7°C

Remarks (comments/detection limits required):	Sample Containers: G - 250mg Glass Jar V - BTEX Vial A - 500mL Ziplock Asbestos Bag H - HNO3 Preserved Plastic G1 - 500mL Glass Amber

Relinquished By: KT	Date: 31 October 2022	Time:	Received By:	Date:
ELS Sydney C. Mullens	1/11/22 900	15:30	ELS HTC	31/10/2022

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

Job No: 30878

Date Received: 31/10/2022

Time Received: 15:30

Received By: MYL

Temp: Cool/Ambient

Cooling: Ice/Icepack

Security: Broken/None

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 309386

Client Details

Client	JK Environments
Attention	Katrina Taylor
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E35521PT, Blayney**
Number of Samples	7 Water
Date samples received	31/10/2022
Date completed instructions received	31/10/2022

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	07/11/2022
Date of Issue	07/11/2022

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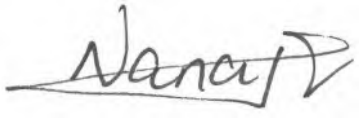
Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Giovanni Agosti, Group Technical Manager
Kyle Gavrily, Senior Chemist
Liam Timmins, Organic Instruments Team Leader
Priya Samarawickrama, Senior Chemist

Authorised By



Nancy Zhang, Laboratory Manager

VOCs in water					
Our Reference		309386-1	309386-2	309386-3	309386-4
Your Reference	UNITS	MW1	MW12	MW15	WDUP1
Date Sampled		28/10/2022	28/10/2022	28/10/2022	28/10/2022
Type of sample		Water	Water	Water	Water
Date extracted	-	04/11/2022	04/11/2022	04/11/2022	04/11/2022
Date analysed	-	07/11/2022	07/11/2022	07/11/2022	07/11/2022
Dichlorodifluoromethane	µg/L	<10	<10	<10	<10
Chloromethane	µg/L	<10	<10	<10	<10
Vinyl Chloride	µg/L	<10	<10	<10	<10
Bromomethane	µg/L	<10	<10	<10	<10
Chloroethane	µg/L	<10	<10	<10	<10
Trichlorofluoromethane	µg/L	<10	<10	<10	<10
1,1-Dichloroethene	µg/L	<1	<1	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1	<1	<1
1,1-dichloroethane	µg/L	<1	<1	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1	<1
Chloroform	µg/L	12	<1	<1	<1
2,2-dichloropropane	µg/L	<1	<1	<1	<1
1,2-dichloroethane	µg/L	<1	<1	<1	<1
1,1,1-trichloroethane	µg/L	<1	<1	<1	<1
1,1-dichloropropene	µg/L	<1	<1	<1	<1
Cyclohexane	µg/L	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1
Benzene	µg/L	<1	<1	<1	<1
Dibromomethane	µg/L	<1	<1	<1	<1
1,2-dichloropropane	µg/L	<1	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1	<1
Bromodichloromethane	µg/L	3	<1	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1	<1	<1
Toluene	µg/L	<1	<1	<1	<1
1,3-dichloropropane	µg/L	<1	<1	<1	<1
Dibromochloromethane	µg/L	<1	<1	<1	<1
1,2-dibromoethane	µg/L	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1	<1	<1
Chlorobenzene	µg/L	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1

VOCs in water					
Our Reference		309386-1	309386-2	309386-3	309386-4
Your Reference	UNITS	MW1	MW12	MW15	WDUP1
Date Sampled		28/10/2022	28/10/2022	28/10/2022	28/10/2022
Type of sample		Water	Water	Water	Water
Bromoform	µg/L	<1	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2	<2
Styrene	µg/L	<1	<1	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1	<1	<1
o-xylene	µg/L	<1	<1	<1	<1
1,2,3-trichloropropane	µg/L	<1	<1	<1	<1
Isopropylbenzene	µg/L	<1	<1	<1	<1
Bromobenzene	µg/L	<1	<1	<1	<1
n-propyl benzene	µg/L	<1	<1	<1	<1
2-chlorotoluene	µg/L	<1	<1	<1	<1
4-chlorotoluene	µg/L	<1	<1	<1	<1
1,3,5-trimethyl benzene	µg/L	<1	<1	<1	<1
Tert-butyl benzene	µg/L	<1	<1	<1	<1
1,2,4-trimethyl benzene	µg/L	<1	<1	<1	<1
1,3-dichlorobenzene	µg/L	<1	<1	<1	<1
Sec-butyl benzene	µg/L	<1	<1	<1	<1
1,4-dichlorobenzene	µg/L	<1	<1	<1	<1
4-isopropyl toluene	µg/L	<1	<1	<1	<1
1,2-dichlorobenzene	µg/L	<1	<1	<1	<1
n-butyl benzene	µg/L	<1	<1	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1	<1	<1
Hexachlorobutadiene	µg/L	<1	<1	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	109	112	102	105
Surrogate toluene-d8	%	104	106	102	105
Surrogate 4-BFB	%	104	103	103	102

vTRH(C6-C10)/BTEXN in Water						
Our Reference		309386-1	309386-2	309386-3	309386-4	309386-6
Your Reference	UNITS	MW1	MW12	MW15	WDUP1	TB-W1
Date Sampled		28/10/2022	28/10/2022	28/10/2022	28/10/2022	28/10/2022
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	04/11/2022	04/11/2022	04/11/2022	04/11/2022	04/11/2022
Date analysed	-	07/11/2022	07/11/2022	07/11/2022	07/11/2022	07/11/2022
TRH C_6 - C_9	µg/L	<10	<10	<10	<10	[NA]
TRH C_6 - C_{10}	µg/L	<10	<10	<10	<10	[NA]
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10	<10	<10	<10	[NA]
Benzene	µg/L	<1	<1	<1	<1	<1
Toluene	µg/L	<1	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2	<2	<2
o-xylene	µg/L	<1	<1	<1	<1	<1
Naphthalene	µg/L	<1	<1	<1	<1	[NA]
Surrogate Dibromofluoromethane	%	109	112	102	105	113
Surrogate toluene-d8	%	104	106	102	105	105
Surrogate 4-BFB	%	104	103	103	102	105

vTRH(C6-C10)/BTEXN in Water		
Our Reference		309386-7
Your Reference	UNITS	TS-W1
Date Sampled		28/10/2022
Type of sample		Water
Date extracted	-	04/11/2022
Date analysed	-	07/11/2022
Benzene	µg/L	99%
Toluene	µg/L	111%
Ethylbenzene	µg/L	114%
m+p-xylene	µg/L	110%
o-xylene	µg/L	111%
Surrogate Dibromofluoromethane	%	106
Surrogate toluene-d8	%	104
Surrogate 4-BFB	%	102

svTRH (C10-C40) in Water					
Our Reference		309386-1	309386-2	309386-3	309386-4
Your Reference	UNITS	MW1	MW12	MW15	WDUP1
Date Sampled		28/10/2022	28/10/2022	28/10/2022	28/10/2022
Type of sample		Water	Water	Water	Water
Date extracted	-	02/11/2022	02/11/2022	02/11/2022	02/11/2022
Date analysed	-	03/11/2022	03/11/2022	03/11/2022	03/11/2022
TRH C_{10} - C_{14}	µg/L	60	<50	<50	<50
TRH C_{15} - C_{28}	µg/L	<100	<100	<100	<100
TRH C_{29} - C_{36}	µg/L	<100	<100	<100	<100
Total +ve TRH (C10-C36)	µg/L	60	<50	<50	<50
TRH >C_{10} - C_{16}	µg/L	120	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	120	<50	<50	<50
TRH >C_{16} - C_{34}	µg/L	<100	<100	<100	<100
TRH >C_{34} - C_{40}	µg/L	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	µg/L	120	<50	<50	<50
Surrogate o-Terphenyl	%	72	73	82	78

PAHs in Water - Low Level					
Our Reference	UNITS	309386-1	309386-2	309386-3	309386-4
Your Reference		MW1	MW12	MW15	WDUP1
Date Sampled		28/10/2022	28/10/2022	28/10/2022	28/10/2022
Type of sample		Water	Water	Water	Water
Date extracted	-	02/11/2022	02/11/2022	02/11/2022	02/11/2022
Date analysed	-	03/11/2022	03/11/2022	03/11/2022	04/11/2022
Naphthalene	µg/L	<0.2	<0.2	<0.2	<0.2
Acenaphthylene	µg/L	<0.1	<0.1	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	µg/L	<0.1	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d14	%	76	72	63	79

HM in water - dissolved					
Our Reference	UNITS	309386-1	309386-2	309386-3	309386-4
Your Reference		MW1	MW12	MW15	WDUP1
Date Sampled		28/10/2022	28/10/2022	28/10/2022	28/10/2022
Type of sample		Water	Water	Water	Water
Date prepared	-	02/11/2022	02/11/2022	02/11/2022	02/11/2022
Date analysed	-	02/11/2022	02/11/2022	02/11/2022	02/11/2022
Arsenic-Dissolved	µg/L	<1	<1	<1	<1
Cadmium-Dissolved	µg/L	<0.1	<0.1	<0.1	<0.1
Chromium-Dissolved	µg/L	<1	<1	<1	<1
Copper-Dissolved	µg/L	<1	<1	<1	<1
Lead-Dissolved	µg/L	<1	<1	<1	<1
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05	<0.05
Nickel-Dissolved	µg/L	2	<1	3	3
Zinc-Dissolved	µg/L	25	15	29	29

Miscellaneous Inorganics				
Our Reference	UNITS	309386-1	309386-2	309386-3
Your Reference		MW1	MW12	MW15
Date Sampled		28/10/2022	28/10/2022	28/10/2022
Type of sample		Water	Water	Water
Date prepared	-	01/11/2022	01/11/2022	01/11/2022
Date analysed	-	01/11/2022	01/11/2022	01/11/2022
pH	pH Units	6.8	7.1	6.4
Electrical Conductivity	µS/cm	210	1,200	340

Method ID	Methodology Summary
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell at 25°C in accordance with APHA latest edition 2510 and Rayment & Lyons.
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-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
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: VOCs in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			04/11/2022	1	04/11/2022	07/11/2022		04/11/2022	[NT]
Date analysed	-			07/11/2022	1	07/11/2022	07/11/2022		07/11/2022	[NT]
Dichlorodifluoromethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Chloromethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Bromomethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Chloroethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	94	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Chloroform	µg/L	1	Org-023	<1	1	12	10	18	95	[NT]
2,2-dichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	94	[NT]
1,1,1-trichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	96	[NT]
1,1-dichloropropene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Cyclohexane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Dibromomethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Trichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	95	[NT]
Bromodichloromethane	µg/L	1	Org-023	<1	1	3	2	40	95	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Toluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,3-dichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-023	<1	1	<1	<1	0	95	[NT]
1,2-dibromoethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	95	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Bromoform	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
m+p-xylene	µg/L	2	Org-023	<2	1	<2	<2	0	[NT]	[NT]
Styrene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]

QUALITY CONTROL: VOCs in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
o-xylene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,3-trichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Isopropylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Bromobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
n-propyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,3,5-trimethyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Tert-butyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,4-trimethyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Sec-butyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
4-isopropyl toluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
n-butyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	104	1	109	99	10	103	[NT]
Surrogate toluene-d8	%		Org-023	103	1	104	102	2	102	[NT]
Surrogate 4-BFB	%		Org-023	103	1	104	99	5	99	[NT]

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	-			04/11/2022	1	04/11/2022	04/11/2022		04/11/2022	[NT]
Date analysed	-			07/11/2022	1	07/11/2022	07/11/2022		07/11/2022	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	1	<10	<10	0	94	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	1	<10	<10	0	94	[NT]
Benzene	µg/L	1	Org-023	<1	1	<1	<1	0	93	[NT]
Toluene	µg/L	1	Org-023	<1	1	<1	<1	0	94	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	95	[NT]
m+p-xylene	µg/L	2	Org-023	<2	1	<2	<2	0	95	[NT]
o-xylene	µg/L	1	Org-023	<1	1	<1	<1	0	94	[NT]
Naphthalene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	104	1	109	99	10	103	[NT]
Surrogate toluene-d8	%		Org-023	103	1	104	102	2	102	[NT]
Surrogate 4-BFB	%		Org-023	103	1	104	99	5	99	[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	-			02/11/2022	1	02/11/2022	02/11/2022		02/01/2022	[NT]
Date analysed	-			03/11/2022	1	03/11/2022	03/11/2022		03/11/2022	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	1	60	58	3	90	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	1	<100	<100	0	111	[NT]
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	1	<100	<100	0	86	[NT]
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	1	120	120	0	90	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	1	<100	<100	0	111	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	1	<100	<100	0	86	[NT]
Surrogate o-Terphenyl	%		Org-020	92	1	72	74	3	83	[NT]

QUALITY CONTROL: PAHs in Water - Low Level						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	309386-2
Date extracted	-			02/11/2022	1	02/11/2022	02/11/2022		02/11/2022	02/11/2022
Date analysed	-			04/11/2022	1	03/11/2022	03/11/2022		03/11/2022	03/11/2022
Naphthalene	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	80	74
Acenaphthylene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	71	75
Fluorene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	76	65
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	80	86
Anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	76	77
Pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	81	83
Benzo(a)anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	75	77
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	68	72
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	84	1	76	76	0	77	75

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	309386-2
Date prepared	-			02/11/2022	1	02/11/2022	02/11/2022		02/11/2022	02/11/2022
Date analysed	-			02/11/2022	1	02/11/2022	02/11/2022		02/11/2022	02/11/2022
Arsenic-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	95	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	1	<0.1	<0.1	0	99	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	96	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	96	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	101	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	1	<0.05	<0.05	0	91	86
Nickel-Dissolved	µg/L	1	Metals-022	<1	1	2	2	0	95	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	1	25	25	0	97	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			01/11/2022	[NT]	[NT]	[NT]	[NT]	01/11/2022	[NT]
Date analysed	-			01/11/2022	[NT]	[NT]	[NT]	[NT]	01/11/2022	[NT]
pH	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	102	[NT]
Electrical Conductivity	µS/cm	1	Inorg-002	<1	[NT]	[NT]	[NT]	[NT]	105	[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.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

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

Samples received in good order: Holding time exceedance for pH

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	JK Environments
Attention	Katrina Taylor

Sample Login Details

Your reference	E35521PT, Blayney
Envirolab Reference	309386
Date Sample Received	31/10/2022
Date Instructions Received	31/10/2022
Date Results Expected to be Reported	07/11/2022

Sample Condition

Samples received in appropriate condition for analysis	Holding time exceedance
No. of Samples Provided	7 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	16
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Holding time exceedance-pH.

Please contact the laboratory within 24 hours if you wish to cancel the aformentioned testing. Otherwise testing will proceed as per the COC and hence invoiced accordingly.

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	VOCs in water	vTRH(C6-C10)/BTEXN in Water	svTRH (C10-C40) in Water	PAHs in Water - Low Level	HM in water - dissolved	pH	Electrical Conductivity	On Hold
MW1	✓	✓	✓	✓	✓	✓	✓	
MW12	✓	✓	✓	✓	✓	✓	✓	
MW15	✓	✓	✓	✓	✓	✓	✓	
WDUP1	✓	✓	✓	✓	✓			
WDUP2								✓
TB-W1		✓						
TS-W1		✓						

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.

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD 12 ASHLEY STREET CHATSWOOD NSW 2067 P: (02) 99106200 F: (02) 99106201 Attention: Aileen	JKE Job Number: E35521PT Date Results Required: STANDARD Page: 1 of 1	JKEnvironments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: Katrina Taylor ktaylor@jkenvironments.com.au

Location:	Blayney	Sample Preserved in Esky on Ice
Sampler:	HW	Tests Required

	Date Sampled	Lab Ref:	Sample Number	Sample Containers	PID	Sample Description	#3L - TRH/BTEXN/LL VOCs (Includes BTEX)	EC/pH	BTEX
1	28/10/2022		MW1	2xG1, 4xV, H, PVC	1	Water	X	X	X
2	28/10/2022		MW12	2xG1, 4xV, H, PVC	0.5	Water	X	X	X
3	28/10/2022		MW15	2xG1, 4xV, H, PVC	0.5	Water	X	X	X
4	28/10/2022		WDUP1	2xG1, 4xV, H	NA	Water	X	X	
5	28/10/2022		WDUP2	2xG1, 4xV, H	NA	Water	X	X	Please send to melbourne Envirolab
6	28/10/2022		TB-W1	V	NA	Water blank			X
7	28/10/2022		TS-W1	V	NA	Water spike			X

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

Job No: 309386

Date Received: 31/10/2022

Time Received: 15:30

Received By: HTL

Temp: Cool/Ambient

Cooling: Ice/Pack

Security: Intact/Broken/None

Remarks (comments/detection limits required):	Sample Containers:
All analysis PQLs to ANZECC (2000) Detection Limits Please	G1 - 500mL Amber Glass Bottle V - BTEX Vial H - HNO3 Wash PVC PVC - HDPE Plastic Bottles

Relinquished By: KT	Date: 31 October 2022	Time: 15:30	Received By: ELS HTL	Date: 31/10/2022

Envirolab Services Pty Ltd
ABN 37 112 535 645 - 002
25 Research Drive Croydon South VIC 3136
ph 03 9763 2500 fax 03 9763 2633
melbourne@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 34328

Client Details

Client	JK Environments
Attention	Katrina Taylor
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E35521PT**
Number of Samples	1 Water
Date samples received	02/11/2022
Date completed instructions received	02/11/2022

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	08/11/2022
Date of Issue	08/11/2022

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

Results Approved By
Suk Lee, Organic Supervisor
Tara White, Metals Team Leader
Tianna Milburn, Chemist

Authorised By

Pamela Adams, Laboratory Manager

VOCs in water - Routine Level		
Our Reference		34328-1
Your Reference	UNITS	WDUP2
Date Sampled		28/10/2022
Type of sample		Water
Date extracted	-	02/11/2022
Date analysed	-	02/11/2022
Dichlorodifluoromethane	µg/L	<10
Chloromethane	µg/L	<10
Vinyl Chloride	µg/L	<10
Bromomethane	µg/L	<10
Chloroethane	µg/L	<10
Trichlorofluoromethane	µg/L	<10
1,1-Dichloroethene	µg/L	<1
Trans-1,2-dichloroethene	µg/L	<1
1,1-dichloroethane	µg/L	<1
Cis-1,2-dichloroethene	µg/L	<1
Bromochloromethane	µg/L	<1
Chloroform	µg/L	11
2,2-dichloropropane	µg/L	<1
1,2-dichloroethane	µg/L	<1
1,1,1-trichloroethane	µg/L	<1
1,1-dichloropropene	µg/L	<1
Cyclohexane	µg/L	<1
Carbon tetrachloride	µg/L	<1
Benzene	µg/L	<1
Dibromomethane	µg/L	<1
1,2-dichloropropane	µg/L	<1
Trichloroethene	µg/L	<1
Bromodichloromethane	µg/L	2
trans-1,3-dichloropropene	µg/L	<1
cis-1,3-dichloropropene	µg/L	<1
1,1,2-trichloroethane	µg/L	<1
Toluene	µg/L	<1
1,3-dichloropropane	µg/L	<1
Dibromochloromethane	µg/L	<1
1,2-dibromoethane	µg/L	<1
Tetrachloroethene	µg/L	<1
1,1,1,2-tetrachloroethane	µg/L	<1
Chlorobenzene	µg/L	<1
Ethylbenzene	µg/L	<1

VOCs in water - Routine Level		
Our Reference		34328-1
Your Reference	UNITS	WDUP2
Date Sampled		28/10/2022
Type of sample		Water
Bromoform	µg/L	<1
m+p-xylene	µg/L	<2
Styrene	µg/L	<1
1,1,2,2-tetrachloroethane	µg/L	<1
o-xylene	µg/L	<1
1,2,3-trichloropropane	µg/L	<1
Isopropylbenzene	µg/L	<1
Bromobenzene	µg/L	<1
n-propyl benzene	µg/L	<1
2-chlorotoluene	µg/L	<1
4-chlorotoluene	µg/L	<1
1,3,5-trimethyl benzene	µg/L	<1
Tert-butyl benzene	µg/L	<1
1,2,4-trimethyl benzene	µg/L	<1
1,3-dichlorobenzene	µg/L	<1
Sec-butyl benzene	µg/L	<1
1,4-dichlorobenzene	µg/L	<1
4-isopropyl toluene	µg/L	<1
1,2-dichlorobenzene	µg/L	<1
n-butyl benzene	µg/L	<1
1,2-dibromo-3-chloropropane	µg/L	<1
1,2,4-trichlorobenzene	µg/L	<1
Hexachlorobutadiene	µg/L	<1
1,2,3-trichlorobenzene	µg/L	<1
Surrogate Dibromofluoromethane	%	104
Surrogate toluene-d8	%	100
Surrogate 4-BFB	%	103

vTRH(C6-C10)/BTEXN in Water		
Our Reference	UNITS	34328-1
Your Reference		WDUP2
Date Sampled		28/10/2022
Type of sample		Water
Date extracted	-	02/11/2022
Date analysed	-	02/11/2022
TRH C_6 - C_9	µg/L	13
TRH C_6 - C_{10}	µg/L	13
TRH C_6 -C_{10} less BTEX (F1)	µg/L	13
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
Total +ve Xylenes	µg/L	<1
Total BTEX in water	µg/L	<1
Surrogate Dibromofluoromethane	%	109
Surrogate toluene-d8	%	104
Surrogate 4-BFB	%	103

TRH Water(C10-C40) NEPM		
Our Reference	UNITS	34328-1
Your Reference		WDUP2
Date Sampled		28/10/2022
Type of sample		Water
Date extracted	-	03/11/2022
Date analysed	-	04/11/2022
TRH C_{10} - C_{14}	µg/L	65
TRH C_{15} - C_{28}	µg/L	<100
TRH C_{29} - C_{36}	µg/L	<100
Total +ve TRH (C10-C36)	µg/L	65
TRH >C_{10} - C_{16}	µg/L	120
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	120
TRH >C_{16} - C_{34}	µg/L	<100
TRH >C_{34} - C_{40}	µg/L	<100
Total +ve TRH (>C10-C40)	µg/L	120
Surrogate o-Terphenyl	%	46

PAHs in Water - Low Level		
Our Reference		34328-1
Your Reference	UNITS	WDUP2
Date Sampled		28/10/2022
Type of sample		Water
Date extracted	-	03/11/2022
Date analysed	-	05/11/2022
Naphthalene	µg/L	<0.1
Acenaphthylene	µg/L	<0.1
Acenaphthene	µg/L	<0.1
Fluorene	µg/L	<0.1
Phenanthrene	µg/L	<0.1
Anthracene	µg/L	<0.1
Fluoranthene	µg/L	<0.1
Pyrene	µg/L	<0.1
Benzo(a)anthracene	µg/L	<0.1
Chrysene	µg/L	<0.1
Benzo(b,j&k)fluoranthene	µg/L	<0.2
Benzo(a)pyrene	µg/L	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1
Total +ve PAH's	µg/L	NIL (+)VE PAH
Benzo(a)pyrene TEQ	µg/L	<0.5
Surrogate p-Terphenyl-d_{14}	%	69

HM in water - dissolved		
Our Reference	UNITS	34328-1
Your Reference		WDUP2
Date Sampled		28/10/2022
Type of sample		Water
Date prepared	-	04/11/2022
Date analysed	-	04/11/2022
Arsenic-Dissolved	µg/L	<1
Cadmium-Dissolved	µg/L	<0.1
Chromium-Dissolved	µg/L	<1
Copper-Dissolved	µg/L	<1
Lead-Dissolved	µg/L	<1
Nickel-Dissolved	µg/L	2
Zinc-Dissolved	µg/L	25
Mercury-Dissolved	µg/L	<0.05

Method ID	Methodology Summary
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Metals-022 ICP-MS	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. 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-022	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater 2013.
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. 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: VOCs in water - Routine Level						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			02/11/2022	1	02/11/2022	02/11/2022		02/11/2022	[NT]
Date analysed	-			02/11/2022	1	02/11/2022	02/11/2022		02/11/2022	[NT]
Dichlorodifluoromethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Chloromethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Bromomethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Chloroethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-023	<10	1	<10	<10	0	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	103	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Chloroform	µg/L	1	Org-023	<1	1	11	12	9	102	[NT]
2,2-dichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	101	[NT]
1,1,1-trichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	99	[NT]
1,1-dichloropropene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Cyclohexane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Dibromomethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Trichloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	94	[NT]
Bromodichloromethane	µg/L	1	Org-023	<1	1	2	2	0	99	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Toluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,3-dichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-023	<1	1	<1	<1	0	92	[NT]
1,2-dibromoethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-023	<1	1	<1	<1	0	90	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Bromoform	µg/L	1	Org-023	<1	1	<1	<1	0	90	[NT]
m+p-xylene	µg/L	2	Org-023	<2	1	<2	<2	0	[NT]	[NT]
Styrene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]

QUALITY CONTROL: VOCs in water - Routine Level						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
o-xylene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,3-trichloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Isopropylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Bromobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
n-propyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,3,5-trimethyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Tert-butyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,4-trimethyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Sec-butyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
4-isopropyl toluene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
n-butyl benzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	100	1	104	103	1	96	[NT]
Surrogate toluene-d8	%		Org-023	98	1	100	100	0	98	[NT]
Surrogate 4-BFB	%		Org-023	102	1	103	103	0	101	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			02/11/2022	1	02/11/2022	02/11/2022		02/11/2022	[NT]
Date analysed	-			02/11/2022	1	02/11/2022	02/11/2022		02/11/2022	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	1	13	16	21	111	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	1	13	16	21	111	[NT]
Benzene	µg/L	1	Org-023	<1	1	<1	<1	0	108	[NT]
Toluene	µg/L	1	Org-023	<1	1	<1	<1	0	112	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	113	[NT]
m+p-xylene	µg/L	2	Org-023	<2	1	<2	<2	0	110	[NT]
o-xylene	µg/L	1	Org-023	<1	1	<1	<1	0	110	[NT]
Naphthalene	µg/L	1	Org-023	<1	1	<1	<1	0	112	[NT]
Surrogate Dibromofluoromethane	%		Org-023	104	1	109	108	1	97	[NT]
Surrogate toluene-d8	%		Org-023	101	1	104	103	1	98	[NT]
Surrogate 4-BFB	%		Org-023	102	1	103	103	0	99	[NT]

QUALITY CONTROL: TRH Water(C10-C40) NEPM						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			03/11/2022	[NT]	[NT]	[NT]	[NT]	03/11/2022	[NT]
Date analysed	-			03/11/2022	[NT]	[NT]	[NT]	[NT]	03/11/2022	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	109	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	119	[NT]
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	120	[NT]
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	109	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	119	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	120	[NT]
Surrogate o-Terphenyl	%		Org-020	73	[NT]	[NT]	[NT]	[NT]	73	[NT]

QUALITY CONTROL: PAHs in Water - Low Level						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			03/11/2022	[NT]	[NT]	[NT]	[NT]	03/11/2022	[NT]
Date analysed	-			05/11/2022	[NT]	[NT]	[NT]	[NT]	05/11/2022	[NT]
Naphthalene	µg/L	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	72	[NT]
Acenaphthylene	µg/L	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	82	[NT]
Fluorene	µg/L	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	76	[NT]
Phenanthrene	µg/L	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Anthracene	µg/L	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Pyrene	µg/L	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Benzo(a)anthracene	µg/L	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Benzo(b,j&k)fluoranthene	µg/L	0.2	Org-022	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d_{14}	%		Org-022	96	[NT]	[NT]	[NT]	[NT]	104	[NT]

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			04/11/2022	[NT]	[NT]	[NT]	[NT]	04/11/2022	[NT]
Date analysed	-			04/11/2022	[NT]	[NT]	[NT]	[NT]	04/11/2022	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022 ICP-MS	<0.1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Chromium-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Copper-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Lead-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Nickel-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Zinc-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021 CV-AAS	<0.05	[NT]	[NT]	[NT]	[NT]	106	[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.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

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

TRH: Low surrogate recovery was obtained due to interferences from the sample matrix.

Envirolab Services Pty Ltd
ABN 37 112 535 645 - 002
25 Research Drive Croydon South VIC 3136
ph 03 9763 2500 fax 03 9763 2633
melbourne@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	JK Environments
Attention	Katrina Taylor

Sample Login Details

Your reference	E35521PT
Envirolab Reference	34328
Date Sample Received	02/11/2022
Date Instructions Received	02/11/2022
Date Results Expected to be Reported	08/11/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	1 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	13.7
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Pamela Adams	Chris De Luca
Phone: 03 9763 2500	**Phone: 03 9763 2500**
Fax: 03 9763 2633	**Fax: 03 9763 2633**
Email: padams@envirolab.com.au	**Email: cdeluca@envirolab.com.au**

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
ABN 37 112 535 645 - 002
25 Research Drive Croydon South VIC 3136
ph 03 9763 2500 fax 03 9763 2633
melbourne@envirolab.com.au
www.envirolab.com.au

Sample ID	VOCs in water - Routine Level	vTRH(C6-C10)/BTEXN in Water	TRH Water(C10-C40) NEPM	PAHs in Water - Low Level	HM in water - dissolved
WDUP2	✓	✓	✓	✓	✓

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.

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD 12 ASHLEY STREET CHATSWOOD NSW 2067 P: (02) 99106200 F: (02) 99106201 Attention: Aileen	JKE Job Number: E35521PT Date Results Required: STANDARD Page: 1 of 1	JKEnvironments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: Katrina Taylor ktaylor@jkenvironments.com.au

Location:	Blayney	Sample Preserved in Esky on Ice
Sampler:	HW	Tests Required

	Date Sampled	Lab Ref:	Sample Number	Sample Containers	PID	Sample Description	#3L - TRH/BTEXN/LL	VOCs (Includes BTEX)	EC/pH	BTEX								
1	28/10/2022		MW1	2xG1, 4xV, H, PVC	1	Water	X	X	X									
2	28/10/2022		MW12	2xG1, 4xV, H, PVC	0.5	Water	X	X	X									
3	28/10/2022		MW15	2xG1, 4xV, H, PVC	0.5	Water	X	X	X									
4	28/10/2022		WDUP1	2xG1, 4xV, H	NA	Water	X	X										
5	28/10/2022		WDUP2	2xG1, 4xV, H	NA	Water	X	X	Please send to melbourne Envirolab									
6	28/10/2022		TB-W1	V	NA	Water blank				X								
T	28/10/2022		TS-W1	V	NA	Water spike				X								

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

ENVIROLAB
Job No: 30986
Date Received: 31/10/2022
Time Received: 15:30
Received By: HTL
Temp: Cool/Ambient
Cooling: Ice/Ice Pack
Security: Intact/Broken/None

Remarks (comments/detection limits required):	Sample Containers:
All analysis PQLs to ANZECC (2000) Detection Limits Please	G1 - 500mL Amber Glass Bottle V - BTEX Vial H - HNO3 Wash PVC PVC - HDPE Plastic Bottles

Relinquished By:	Date:	Time:	Received By:	Date:
KT ELS Sydney Q.Mwamba 1/11 900 CM	31 October 2022	15:30	ELS HTL	31/10/2022

Appendix E: Report Explanatory Notes

QA/QC Definitions

The QA/QC terms used in this report are defined below. The definitions are in accordance with US EPA publication SW-846, entitled *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (1994)[15] methods and those described in *Environmental Sampling and Analysis, A Practical Guide,* (1991)[16]. The NEPM (2013) is consistent with these documents.

A. Practical Quantitation Limit (PQL), Limit of Reporting (LOR) & Estimated Quantitation Limit (EQL)

These terms all refer to the concentration above which results can be expressed with a minimum 95% confidence level. The laboratory reporting limits are generally set at ten times the standard deviation for the Method Detection Limit for each specific analyte. For the purposes of this report the LOR, PQL, and EQL are considered to be equivalent.

When assessing laboratory data it should be borne in mind that values at or near the PQL have two important limitations: *"The uncertainty of the measurement value can approach, and even equal, the reported value. Secondly, confirmation of the analytes reported is virtually impossible unless identification uses highly selective methods. These issues diminish when reliably measurable amounts of analytes are present. Accordingly, legal and regulatory actions should be limited to data at or above the reliable detection limit*" (Keith, 1991).

B. Precision

The degree to which data generated from repeated measurements differ from one another due to random errors. Precision is measured using the standard deviation or Relative Percent Difference (RPD).

C. Accuracy

Accuracy is a measure of the agreement between an experimental result and the true value of the parameter being measured (i.e. the proximity of an averaged result to the true value, where all random errors have been statistically removed). The assessment of accuracy for an analysis can be achieved through the analysis of known reference materials or assessed by the analysis of surrogates, field blanks, trip spikes and matrix spikes. Accuracy is typically reported as percent recovery.

D. Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness is primarily dependent upon the design and implementation of the sampling program. Representativeness of the data is partially ensured by the avoidance of contamination, adherence to sample handing and analysis protocols and use of proper chain-of-custody and documentation procedures.

E. Completeness

Completeness is a measure of the number of valid measurements in a data set compared to the total number of measurements made and overall performance against DQIs. The following information is assessed for completeness:

- Chain-of-custody forms;
- Sample receipt form;
- All sample results reported;
- All blank data reported;

[15] US EPA, (1994). *SW-846: Test Methods for Evaluating Solid Waste, Physical/Chemical Methods.* (US EPA SW-846)

[16] Keith., H, (1991). *Environmental Sampling and Analysis, A Practical Guide*

- All laboratory duplicate and RPDs calculated;
- All surrogate spike data reported;
- All matrix spike and lab control spike (LCS) data reported and RPDs calculated;
- Spike recovery acceptable limits reported; and
- NATA stamp on reports.

F. Comparability

Comparability is the evaluation of the similarity of conditions (e.g. sample depth, sample homogeneity) under which separate sets of data are produced. Data comparability checks include a bias assessment that may arise from the following sources:

- Collection and analysis of samples by different personnel; Use of different techniques;
- Collection and analysis by the same personnel using the same methods but at different times; and
- Spatial and temporal changes (due to environmental dynamics).

G. Blanks

The purpose of laboratory and field blanks is to check for artefacts and interferences that may arise during sampling, transport and analysis.

H. Matrix Spikes

Samples are spiked with laboratory grade standards to detect interactive effects between the sample matrix and the analytes being measured. Matrix Spikes are reported as a percent recovery and are prepared for 1 in every 20 samples. Sample batches that contain less than 20 samples may be reported with a Matrix Spike from another batch. The percent recovery is calculated using the formula below. Acceptable recovery limits are 70% to 130%.

$$\frac{\text{(Spike Sample Result – Sample Result) x 100}}{\text{Concentration of Spike Added}}$$

I. Surrogate Spikes

Samples are spiked with a known concentration of compounds that are chemically related to the analyte being investigated but unlikely to be detected in the environment. The purpose of the Surrogate Spikes is to check the accuracy of the analytical technique. Surrogate Spikes are reported as percent recovery.

J. Duplicates

Laboratory duplicates measure precision, expressed as Relative Percent Difference. Duplicates are prepared from a single field sample and analysed as two separate extraction procedures in the laboratory. The RPD is calculated using the formula where D1 is the sample concentration and D2 is the duplicate sample concentration:

$$\frac{(D1 - D2) \times 100}{\{(D1 + D2)/2\}}$$

Appendix F: Data (QA/QC) Evaluation

Data (QA/QC) Evaluation

A. INTRODUCTION

This Data (QA/QC) Evaluation forms part of the validation process for the DQOs documented in Section 5.1 of this report. Checks were made to assess the data in terms of precision, accuracy, representativeness, comparability and completeness. These 'PARCC' parameters are referred to collectively as DQIs and are defined in the Report Explanatory Notes attached in the report appendices.

1. Field and Laboratory Considerations

The quality of the analytical data produced for this project has been considered in relation to the following:

- Sample collection, storage, transport and analysis;
- Laboratory PQLs;
- Field QA/QC results; and
- Laboratory QA/QC results.

2. Field QA/QC Samples and Analysis

A summary of the field QA/QC samples collected and analysed for this investigation is provided in the following table:

Sample Type	Sample Identification	Frequency (of Sample Type)	Analysis Performed
Intra-laboratory duplicate (soil)	SDUP3 (primary sample BH15 0-0.1m)	Approximately 7% of primary samples	Heavy metals, TRH/BTEX, PAHs, OCPs, OPPs and PCBs
Inter-laboratory duplicate (soil)	SDUP2 (primary sample BH20 0-0.1m)	As above	Heavy metals, TRH/BTEX, PAHs
Intra-laboratory duplicate (water)	WDUP1 (primary sample MW15)	Approximately 33% of primary samples	VOCs, Heavy metals, TRH/BTEX, PAHs
Inter-laboratory duplicate (water)	WDUP2 (primary sample MW1)	As above	As above
Trip spike (soil)	TS-S1 (24-28 October 2022)	One for the investigation to demonstrate adequacy of preservation, storage and transport methods	BTEX
Trip blank (soil)	TB-S1 (24-28 October 2022)	One for the investigation to demonstrate adequacy of storage and transport methods	Heavy metals, TRH/BTEX, PAHs, OCPs, OPPs and PCBs
Rinsate (soil SPT)	FR-SPT-S1 (27 October 2022)	One for the investigation to demonstrate adequacy of decontamination methods	Heavy metals, TRH/BTEX, PAHs, OCPs, OPPs and PCBs

Sample Type	Sample Identification	Frequency (of Sample Type)	Analysis Performed
Trip spike (water)	TS-W1 (28 October 2022)	One for the investigation to demonstrate adequacy of preservation, storage and transport methods	BTEX
Trip blank (water)	TB-W1 (28 October 2022)	One for the investigation to demonstrate adequacy of storage and transport methods	BTEX

The results for the field QA/QC samples are detailed in the laboratory summary tables (Table Q1 and Table Q2 inclusive) attached to the investigation report and are discussed in the subsequent sections of this Data (QA/QC) Evaluation report.

3. Data Assessment Criteria

JKE adopted the following criteria for assessing the field and laboratory QA/QC analytical results:

Field Duplicates

Acceptable targets for precision of field duplicates in this report will be 30% or less, consistent with NEPM (2013). RPD failures will be considered qualitatively on a case-by-case basis taking into account factors such as the concentrations used to calculate the RPD (i.e. RPD exceedance where concentrations are close to the PQL are typically not as significant as those where concentrations are reported at least five or 10 times the PQL), sample type, collection methods and the specific analyte where the RPD exceedance was reported.

Field/Trip Blanks and Rinsates

Acceptable targets for field blank and rinsate samples in this report will be less than the PQL for organic analytes. Metals will be considered on a case-by-case basis with regards to typical background concentrations in soils and published drinking water guidelines for waters.

Trip Spikes

Acceptable targets for trip spike samples in this report will be 70% to 130%.

Laboratory QA/QC

The suitability of the laboratory data is assessed against the laboratory QA/QC criteria which is outlined in the laboratory reports. These criteria were developed and implemented in accordance with the laboratory's NATA accreditation and align with the acceptable limits for QA/QC samples as outlined in NEPM (2013) and other relevant guidelines.

A summary of the acceptable limits adopted by the primary laboratory (Envirolab) is provided below:

RPDs

- Results that are <5 times the PQL, any RPD is acceptable; and
- Results >5 times the PQL, RPDs between 0-50% are acceptable.

Laboratory Control Samples (LCS) and Matrix Spikes

- 70-130% recovery acceptable for metals and inorganics;
- 60-140% recovery acceptable for organics; and
- 10-140% recovery acceptable for VOCs.

Surrogate Spikes

- 60-140% recovery acceptable for general organics; and
- 10-140% recovery acceptable for VOCs.

Method Blanks

- All results less than PQL.

B. DATA EVALUATION

1. Sample Collection, Storage, Transport and Analysis

Samples were collected by trained field staff in accordance. Field sampling procedures were designed to be consistent with relevant guidelines, including NEPM (2013) and other guidelines made under the CLM Act 1997.

Appropriate sample preservation, handling and storage procedures were adopted. Laboratory analysis was undertaken within specified holding times generally in accordance with Schedule B(3) of NEPM (2013) and the laboratory NATA accredited methodologies. Envirolab noted that the asbestos results were reported to be consistent with the recommendations in NEPM (2013), however this level of reporting is outside the scope of their NATA accreditation. In the absence of other available analytical methods for asbestos, this was found to be acceptable for the purpose of this investigation.

JKE note that the temperature on receipt of soil samples was reported to be up to 16°C. JKE understand that the temperature is measured at the laboratory using an infrared temperature probe by scanning the outside of the sample container (i.e. one sample jar/container at the time of registering the samples). This procedure is not considered to be robust as there is a potential for the outside of the jar to warm to ambient temperature, or at least to increase from that of the internal contents, relatively quickly. On this basis, JKE is of the opinion that the temperatures reported on the Sample Receipts are unlikely to be reliable or representative of the overall batch. This is further supported by the trip spike recovery results (discussed further below) which reported adequate recovery in the range of 98% to 101%.

Review of the project data also indicated that:

- COC documentation was adequately maintained;
- Sample receipt advice documentation was provided for all sample batches;
- All analytical results were reported; and
- Consistent units were used to report the analysis results.

2. Laboratory PQLs

Appropriate PQLs were adopted for the analysis and all PQLs were below the SAC, with the exception of the anthracene PQL for groundwater analysis which was 10 times greater than the ecological SAC, vinyl chloride, hexachlorobutaduiene and benzo(a)pyrene which were all greater than the health based SAC. In light of the

PAH and VOC concentrations reported for soil and groundwater, JKE is of the opinion that this is not significant, and it does not affect the quality of the dataset as a whole or the outcome of the investigation.

3. Field QA/QC Sample Results

Field Duplicates

The results indicated that field precision was acceptable. RPD non-conformances were reported for some analytes as discussed below:

- An elevated RPD was reported for arsenic in SDUP3/BH15 (0-0.1m);
- Elevated RPDs were reported for TRH F4, chromium and lead in SDUP2/BH20 (0-0.1m); and
- Elevated RPDs were reported for bromodichloromethane and TRH F1 in WDUP2/MW1.

Values outside the acceptable limits have been attributed to minor sample heterogeneity and the difficulties associated with obtaining homogenous duplicate samples of heterogeneous matrices. As both the primary and duplicate sample results were less than the SAC, the exceedances are not considered to have had an adverse impact on the data set as a whole.

Trip Blanks

During the investigation, one soil trip blank and one water trip blank was placed in the esky during sampling and transported back to the laboratory. The soil trip blank analysis results were all less than the PQLs with the exception of chromium, lead and zinc with reported concentrations of 3mg/kg, 2mg/kg and 2mg/kg respectively. Low level metals concentrations are typical in washed sand which is utilised as blank material. In JKE's experience, the concentrations reported were consistent with background concentrations in a sand matrix and were not indicative of cross-contamination. On this basis, cross contamination between samples that may have significance for data validity did not occur.

The water trip blank results were all less than the PQLs, therefore cross contamination between samples that may have significance for data validity did not occur.

Rinsates

A low concentration of TRH was detected in the rinsate sample. This detection is consistent with the use of plastic containers (these were used to store the rinsate water) as noted in the Envirolab report comments (report ref: 309378).

Trip Spikes

The soil trip spike results ranged from 97% to 104% and indicated that field preservation methods were appropriate.

The water trip spike results ranged from 99% to 114% and indicated that field preservation methods were appropriate.

4. Laboratory QA/QC

The analytical methods implemented by the laboratory were performed in accordance with their NATA accreditation and were consistent with Schedule B(3) of NEPM (2013). The frequency of data reported for the laboratory QA/QC (i.e. duplicates, spikes, blanks, LCS) was considered to be acceptable for the purpose of this investigation. A review of the laboratory QA/QC data identified the following minor non-conformances:

Envirolab Report 309378

- The positive result of TRH (C10-C40) in the rinsate sample is due to a single peak with no hydrocarbon profile that is consistent with the use of plastic containers; and
- Percent recovery was not possible to report for metals in soil due to the inhomogeneous nature of the element/s in the sample/s. However, an acceptable recovery was obtained for the LCS.

Envirolab Report 309378-A

- Samples were out of the recommended holding time for pH in soil analysis.

Envirolab Report 309386

- Samples were out of the recommended holding time for pH in water analysis.

Envirolab Report 34328

- Low surrogate recovery was obtained for TRH due to interferences from the sample matrix.

The laboratory non-conformances were minor and did not compromise the data quality. The pH holding time exceedances could not be avoided due to the remote site location and transportation requirements to get the samples to the laboratory. Notwithstanding, the holding time exceedances are not considered significant as they do not compromise the data to the extent that it would alter the conclusions of the report.

C. DATA QUALITY SUMMARY

JKE is of the opinion that the data are adequately precise, accurate, representative, comparable and complete to serve as a basis for interpretation to achieve the investigation objectives.

Non-conformances were reported for some field QA/QC samples and laboratory QA/QC analysis. These non-conformances were considered to be sporadic and minor, and were not considered to be indicative of systematic sampling or analytical errors. On this basis, these non-conformances are not considered to materially impact the report findings.

There was only one groundwater monitoring event undertaken for the investigation. On this basis there is some uncertainty around the representativeness of the groundwater data, particularly during different climatic conditions and after wet/dry periods. However, given the low contaminant concentrations reported, the site history and the surrounding land uses, this is not considered to alter the conclusions of the investigation. Additional investigation has been recommended nevertheless and this uncertainty will be addressed via the additional investigations to a large degree.

Appendix G: Field Work Documents

JKEnvironments

Client:	HI c/- APP	Job No.:	E35521PT
Project:	Proposed Hospital Development	Well No.:	MW1
Location:	3 Osman Street, BLAYNEY, NSW	Depth (m):	6.0

WELL FINISH

✓	Gatic Cover		Standpipe		Other (describe)

WELL PURGE DETAILS:

Method:	Low flow Peristaltic pump	SWL – Before:	4.38
Date:	28/10/22	Time – Before:	8:18am
Undertaken By:	HW	Total Vol Removed:	~0.8L
Pump Program No:	Low	PID (ppm):	1.0

PURGING / SAMPLING MEASUREMENTS

Time (min)	SWL (m)	Vol (L)	Notes	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
8:26am, 8	4.48	0.5	clear	13.2	6.8	181.5	6.26	92.1
11	4.50	0.6	"	13.1	6.8	177.5	6.26	85.2
15	4.58	0.7	"	13.3	6.7	176.0	6.23	79.1
18	4.62	0.8	"	13.4	6.8	172.2	6.23	77.7
			start sampling					

Comments: Odours (YES / NO), NAPL/PSH (YES / NO) Sheen (YES / NO), Steady State Achieved (YES / NO)

Sampling Containers Used: 4x glass amber, 8 x BTEX vials, 2 x HNO3 plastic, –x H2SO4 plastic, / x unpreserved plastic

YSI used: 3 Field duplicate : WDUP2

Tested By: ~~Katrina Taylor~~ HW

Date Tested: 28/10/22

Checked By: KT

Date: 19.12.22

Remarks:

- Steady state conditions
- difference in the pH less than 0.2 units, difference in conductivity less than 10% 10% and SWL stable/not in drawdown

JKEnvironments

Client:	HI c/- APP	**Job No.:**	E35521PT
Project:	Proposed Hospital Development	**Well No.:**	MW12
Location:	3 Osman Street, BLAYNEY, NSW	**Depth (m):**	6.0

WELL FINISH

✓	Gatic Cover		Standpipe		Other (describe)

WELL PURGE DETAILS:

Method:	Low flow peristaltic pump	**SWL – Before:**	3.43
Date:	28/10/22	**Time – Before:**	12:11pm
Undertaken By:	HW	**Total Vol Removed:**	20
Pump Program No:	Low	**PID (ppm):**	0.5

PURGING / SAMPLING MEASUREMENTS

Time (min)	SWL (m)	Vol (L)	Notes	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
12:18pm 5	3.47	0.5	clear	13.9	5.7	474.3	6.30	54.6
8	3.48	0.6	"	13.8	5.2	496.5	6.29	55.4
11	3.49	0.7	"	13.7	5.1	563	6.29	57.3
14	3.51	0.8	"	13.6	5.0	620	6.32	57.4
17	3.52	0.9	"	13.7	5.0	669	6.33	58.3
20	3.53	1.0	"	13.7	5.0	675	6.35	57.1
			Started sampling					

Comments: Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)

Sampling Containers Used: 2x glass amber, 4x BTEX vials, 1x HNO3 plastic, —x H2SO4 plastic, 1x unpreserved plastic

YSI used: 3

Tested By: ~~Katrina Taylor~~ HW	**Remarks:**
Date Tested: 28/10/22	- Steady state conditions - difference in the pH less than 0.2 units, difference in conductivity less than 10%
Checked By: KT	10% and SWL stable/not in drawdown
Date: 19.12.22	

JKEnvironments

Client:	HI c/- APP	Job No.:	E35521PT
Project:	Proposed Hospital Development	Well No.:	MW15
Location:	3 Osman Street, BLAYNEY, NSW	Depth (m):	6.0

WELL FINISH

✓	Gatic Cover		Standpipe		Other (describe)

WELL PURGE DETAILS:

Method:	Low flow Peristaltic pump	SWL – Before:	0.81
Date:	28/10/22	Time – Before:	10:18am
Undertaken By:	HW	Total Vol Removed:	~1.8L
Pump Program No:	Low	PID (ppm):	0.5

PURGING / SAMPLING MEASUREMENTS

Time (min)	SWL (m)	Vol (L)	Notes	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
10:24am 4	0.92	0.5	Clear	15.1	9.5	248.0	5.91	59.4
8	0.96	0.8	"	14.3	9.4	246.7	5.89	58.7
11	1.0	1.0	"	14.1	7.4	246.9	5.84	60.3
14	1.04	1.2	"	14.3	6.1	249.6	5.84	60.7
17	1.07	1.3	"	14.7	5.5	251.6	5.86	57.9
20	1.09	1.4	"	14.5	5.8	250.7	5.86	57.3
24	1.13	1.5	"	13.8	5.7	244.6	5.82	58.5
27	1.16	1.6	"	13.8	5.7	244.3	5.78	59.5
31	1.17	1.7	"	14.2	5.5	246.6	5.81	57.8
34	1.19	1.8	"	14.0	5.6	245.8	5.81	57.6
			Start Sampling					

Comments: Odours (YES / (NO)), NAPL/PSH (YES / (NO)), Sheen (YES / (NO)), Steady State Achieved (YES / (NO))

Sampling Containers Used: 4x glass amber, 8x BTEX vials, 2x HNO3 plastic, –x H2SO4 plastic, 1x unpreserved plastic

YSI used: 3 Field Duplicate : WDUP1

Tested By: ~~Katrina Taylor~~ HW

Date Tested: 28/10/22

Checked By: KT

Date: 19.12.22

Remarks:

- Steady state conditions
- difference in the pH less than 0.2 units, difference in conductivity less than 10% 10% and SWL stable/not in drawdown

JKEnvironments

Client:	HI c/- APP	Job No.:	E35521PT
Project:	Proposed Hospital Development	Well No.:	MW1
Location:	3 Osman Street, BLAYNEY, NSW	Depth (m):	6.0

WELL FINISH DETAILS

	Gatic Cover ☑	Standpipe ☐	Other (describe) ☐

WELL DEVELOPMENT DETAILS

Method:	Development pump	SWL – Before (m):	4.74
Date:	26/10/22	Time – Before:	8:42am
Undertaken By:	HW	SWL – After (m):	Dry
Total Vol. Removed:	~4.0L	Time – After:	8:55am
PID Reading (ppm):	0.7		

Comments:

DEVELOPMENT MEASUREMENTS

Volume Removed (L)	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
8:48am 2 dry	16.1	8.8	173.8	6.21	-58.2
8:54am 4	15.7	9.0	152.4	6.58	-0.5
well dry					

Comments: Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)

YSI Used: 3 High silt load, Yellow brown. Low recharge. Approximately 2L of potable water introduced. Pumped dry.

Tested By:	HW
Date Tested:	26/10/22
Checked By:	KT
Date:	19.12.22

Remarks:

- Steady state conditions
- Difference in the pH less than 0.2 units, difference in the conductiveity less than 10% and SWL stable/not in drawdown
- Minimum 3 monitoring well volumes purged, unless well purged until it is effectively dry

JKEnvironments

Client:	HI c/- APP	**Job No.:**	E35521PT
Project:	Proposed Hospital Development	**Well No.:**	MW12
Location:	3 Osman Street, BLAYNEY, NSW	**Depth (m):**	6.0

WELL FINISH DETAILS

	Gatic Cover ☑	Standpipe ☐	Other (describe) ☐

WELL DEVELOPMENT DETAILS

Method:	Bladder/pneumatic pump	**SWL – Before (m):**	5.61
Date:	26/10/22	**Time – Before:**	4:27pm
Undertaken By:	HW	**SWL – After (m):**	DRY
Total Vol. Removed:	~1.5	**Time – After:**	4:39
PID Reading (ppm):	0.1		

Comments:

DEVELOPMENT MEASUREMENTS

Volume Removed (L)	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
4:37pm, 1.5	15.1	9.1	513	6.79	59.3
well dry					

Comments: Odours (YES / NO) NAPL/PSH (YES / NO) Sheen (YES / NO) Steady State Achieved (YES / NO)

YSI Used: 3

Tested By:	HW
Date Tested:	26/10/22
Checked By:	KT
Date:	19.12.22

Remarks:
- Steady state conditions
- Difference in the pH less than 0.2 units, difference in the conductiveity less than 10% and SWL stable/not in drawdown
- Minimum 3 monitoring well volumes purged, unless well purged until it is effectively dry

JKEnvironments

Client:	HI c/- APP	**Job No.:**	E35521PT
Project:	Proposed Hospital Development	**Well No.:**	MW15
Location:	3 Osman Street, BLAYNEY, NSW	**Depth (m):**	6.0

WELL FINISH DETAILS

	Gatic Cover ☑	Standpipe ☐	Other (describe) ☐

WELL DEVELOPMENT DETAILS

Method:	Development Pump	**SWL – Before (m):**	1.38
Date:	26/10/22	**Time – Before:**	1:11pm
Undertaken By:	HW	**SWL – After (m):**	DRY
Total Vol. Removed:	~8L	**Time – After:**	1:20pm
PID Reading (ppm):	0.6		

Comments:

DEVELOPMENT MEASUREMENTS

Volume Removed (L)	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
1:18pm 2	15.0	8.0	239.9	7.53	35.9
4	14.6	6.8	222.9	6.80	38.7
6	14.6	5.9	235.9	6.36	41.7
8	14.3	6.6	233.3	6.06	44.1
well dry					

Comments: Odours (YES / (NO)) NAPL/PSH (YES / (NO)) Sheen (YES / (NO)) Steady State Achieved (YES / (NO))

YSI Used: 3 moderate silt load, yellow brown.

Tested By:	HW
Date Tested:	26/10/22
Checked By:	KT
Date:	19.12.22

Remarks:

- Steady state conditions
- Difference in the pH less than 0.2 units, difference in the conductiveity less than 10% and SWL stable/not in drawdown
- Minimum 3 monitoring well volumes purged, unless well purged until it is effectively dry

JKEnvironments

WATER QUALITY METER CALIBRATION FORM

Client:	HI c/- APP		
Project:	Proposed Hospital Development		
Location:	3 Osman Street, BLAYNEY, NSW		
Job Number:	E35521PT		
DISSOLVED OXYGEN			
Make: YSI	Model: Professional plus		
Date of calibration: 28/10/22	Name of Calibrator: HW		
Span value: 70% to 130%			
Measured value: 107%			
Measured reading Acceptable (Yes/No):			
pH			
Make: YSI	Model: Professional plus		
Date of calibration: 28/10/22	Name of Calibrator: HW		
Buffer 1: Theoretical pH = 7.01± 0.01	Expiry date: 06/23	Lot No: 384001	
Buffer 2: Theoretical pH = 4.01± 0.01	Expiry date: 09/23	Lot No: 386479	
Measured reading of Buffer 1: 7.11			
Measured reading of Buffer 2: 4.07			
Slope: —	Measured reading Acceptable (Yes/No):		
EC			
Make: YSI	Model: Professional plus		
Date:	Name of Calibrator: HW	Temperature: 11.5 °C	
Calibration solution: Conductivity Standard	Expiry date: 09/23	Lot No: 386922	
Theoretical conductivity at temperature (see solution container): 1062 µS/cm			
Measured conductivity: 1219 µS/cm	Measured reading Acceptable (Yes/No):		
REDOX			
Make: YSI	Model: Professional plus		
Date of calibration: 28/10/22	Name of Calibrator: HW		
Calibration solution: ORP Test Solution	Expiry date: 01/27	Lot No: 7352	
Theoretical redox value: 240mV			
Measured redox reading: 250.2 mV	Measured reading Acceptable (Yes/No):		

JKEnvironments

WATER QUALITY METER CALIBRATION FORM

Client:	HI c/- APP		
Project:	Proposed Hospital Development		
Location:	3 Osman Street, BLAYNEY, NSW		
Job Number:	E35521PT		
DISSOLVED OXYGEN			
Make: YSI	Model: professional plus		
Date of calibration: 25/10/22	Name of Calibrator: HW		
Span value: 70% to 130%			
Measured value: 89%			
Measured reading Acceptable (Yes/No):			
pH			
Make: YSI	Model: professional plus		
Date of calibration: 25/10/22	Name of Calibrator: HW		
Buffer 1: Theoretical pH = 7.01± 0.01	Expiry date: 06/23	Lot No: 384001	
Buffer 2: Theoretical pH = 4.01± 0.01	Expiry date: 09/23	Lot No: 386479	
Measured reading of Buffer 1: 6.98			
Measured reading of Buffer 2: 3.97			
Slope: –	Measured reading Acceptable (Yes/No):		
EC			
Make: YSI	Model: professional plus		
Date: 25/10/22	Name of Calibrator: HW	Temperature: 17.6 °C	
Calibration solution: Conductivity standard	Expiry date: 09/23	Lot No: 386922	
Theoretical conductivity at temperature (see solution container): 1224 µS/cm			
Measured conductivity: ~~1317~~ 1303 µS/cm	Measured reading Acceptable (Yes/No):		
REDOX			
Make: YSI	Model: professional plus		
Date of calibration: 25/10/22	Name of Calibrator: HW		
Calibration solution: ORP Test Solution	Expiry date: 01/27	Lot No: 7352	
Theoretical redox value: 240mV			
Measured redox reading: 237.1 mV	Measured reading Acceptable (Yes/No):		

JKEnvironments

PID FIELD CALIBRATION FORM

Client:	HI c/- APP
Project:	Proposed Hospital Development
Location:	3 Osman Street, BLAYNEY, NSW
Job Number:	E35521PT

PID			
Make: RAE	Model: MiniRAE 2000	Unit: Green (2)	Date of last factory calibration:
Date of calibration: 21/10/22		Name of Calibrator: HW	
Calibration gas: Iso-butylene		Calibration Gas Concentration: 100.0 ppm	
Measured reading: 100.1 ppm		Error in measured reading: ± 0.1 ppm	
Measured reading Acceptable ([✓ Yes]/No):			

PID			
Make:	Model:	Unit:	Date of last factory calibration:
Date of calibration:		Name of Calibrator:	
Calibration gas: Iso-butylene		Calibration Gas Concentration: 100.0 ppm	
Measured reading: ppm		Error in measured reading: ± ppm	
Measured reading Acceptable (Yes/No):			

PID			
Make:	Model:	Unit:	Date of last factory calibration:
Date of calibration:		Name of Calibrator:	
Calibration gas: Iso-butylene		Calibration Gas Concentration: 100.0 ppm	
Measured reading: ppm		Error in measured reading: ± ppm	
Measured reading Acceptable (Yes/No):			

PID			
Make:	Model:	Unit:	Date of last factory calibration:
Date of calibration:		Name of Calibrator:	
Calibration gas: Iso-butylene		Calibration Gas Concentration: 100.0 ppm	
Measured reading: ppm		Error in measured reading: ± ppm	
Measured reading Acceptable (Yes/No):			

PID			
Make:	Model:	Unit:	Date of last factory calibration:
Date of calibration:		Name of Calibrator:	
Calibration gas: Iso-butylene		Calibration Gas Concentration: 100.0 ppm	
Measured reading: ppm		Error in measured reading: ± ppm	
Measured reading Acceptable (Yes/No):			

Appendix H: Guidelines and Reference Documents

Australian and New Zealand Environment Conservation Council (ANZECC), (2000). Australian and New Zealand Guidelines for Fresh and Marine Water Quality

Canadian Council of Ministers of the Environment, (1999). Canadian soil quality guidelines for the protection of environmental and human health: Benzo(a)Pyrene (1997)

CRC Care, (2011). Technical Report No. 10 – Health screening levels for hydrocarbons in soil and groundwater Part 1: Technical development document

Contaminated Land Management Act 1997 (NSW)

Department of Land and Water Conservation, (1997). 1:25,000 Acid Sulfate Soil Risk Map Series

Managing Land Contamination, Planning Guidelines SEPP55 – Remediation of Land (1998)

National Health and Medical Research Council (NHMRC), (2021). National Water Quality Management Strategy, Australian Drinking Water Guidelines 2011

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

NSW EPA, (1995). Contaminated Sites Sampling Design Guidelines

NSW EPA, (2014). Waste Classification Guidelines - Part 1: Classifying Waste

NSW EPA, (2015). Guidelines on the Duty to Report Contamination under Section 60 of the CLM Act 1997

NSW EPA, (2017). Guidelines for the NSW Site Auditor Scheme, 3rd Edition

NSW EPA, (2020). Consultants Reporting on Contaminated Land, Contaminated Land Guidelines

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

Olszowy, H., Torr, P., and Imray, P., (1995). Trace Element Concentrations in Soils from Rural and Urban Areas of Australia. Contaminated Sites Monograph Series No. 4. Department of Human Services and Health, Environment Protection Agency, and South Australian Health Commission

Protection of the Environment Operations Act 1997 (NSW)

State Environmental Planning Policy (Resilience and Hazards) 2021 (NSW)

World Health Organisation (WHO), (2008). Petroleum Products in Drinking-water, Background document for the development of WHO Guidelines for Drinking Water Quality

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