REPORT TO

NSW HEALTH INFRASTRUCTURE

ON

REMEDIATION ACTION PLAN

FOR

PROPOSED MPS STAGE 5 DEVELOPMENT

AT

BLAYNEY DISTRICT HOSPITAL, 3 OSMAN STREET, BLAYNEY, NSW

Date: 1 August 2023
Ref: E35521PTrpt4-RAP

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Executive Summary

NSW Health Infrastructure ('the client') commissioned JK Environments (JKE) to prepare a Remediation Action Plan (RAP) for the proposed MPS Stage 5 development at Blayney District Hospital, 3 Osman Street, Blayney, NSW ('the site'). The site location is shown on Figure 1 and the RAP applies to the land within the site boundaries as shown on Figure 2 attached in Appendix A.

JKE has previously undertaken a Desktop Preliminary Site Investigation, a Preliminary Site Investigation (PSI) and a Detailed Site Investigation (DSI) at the site. A summary of these investigations and other relevant information is provided in Section 2. The investigations identified a redundant underground storage tank (UST) in the eastern part of the site, along with the occurrence of asbestos in soil.

This RAP has been prepared to demonstrate that the site can be made suitable for the proposed hospital development via remediation, with regards to Chapter 4 of State Environmental Planning Policy (Resilience and Hazards) 2021 (formerly known as SEPP55). It is understood that the RAP will support the Review of Environmental Factors (REF) for the proposed development.

The goal of the remediation is to reduce contamination-related risks to human health and the environment, and to render the site suitable for the proposed development from a contamination viewpoint. The primary aims of the remediation are to mitigate risks from asbestos, and to remove the UST, any associated infrastructure and any localised impacted soil within the vicinity of the UST. The objectives of this RAP are to:

- Document the requirements for pre-remediation (data gap) investigation;
- Provide a rationale to support the extent of the proposed remediation and the remedial/site validation approach based on the current dataset;
- Document a methodology that is to be implemented to remediate and validate the site; and
- Document a strategy that can be implemented in the event of uncovering any unexpected, contamination-related finds, and provide other relevant contingency plans.

Investigations have identified a redundant UST in the eastern section of the site. Risks from soil contamination were predominantly assessed to be low in the DSI report, however, asbestos has been identified in fill/soil and parts of the site have been inaccessible to date and need to be investigated when access becomes available (i.e. after demolition of buildings). The outcome of these further investigations and a site-specific human health risk assessment (HHRA) will be used to establish whether any additional remediation is required (as specified in Section 6 of this RAP).

The proposed development will occur in three stages and this RAP includes provisions for carrying out the required activities and reporting to align with the development stages. The RAP outlines requirements for remediation of the UST area by removing the tank and any associated infrastructure, excavating any localised contaminated soil, and disposing of this to a licensed landfill facility.

A construction/remediation-phase Asbestos Management Plan (AMP) will be in place to manage potential asbestos risks to workers and adjacent land users. Although the PSI identified one location (BH3) containing asbestos at a concentration that exceeded the site assessment criteria (SAC), the BH3 area was subsequently excavated and the material was disposed off-site when constructing the temporary carpark. Therefore, asbestos remediation is not proposed in this RAP and the need for asbestos remediation will be further assessed following the investigations that must occur after the demolition of the buildings.

The RAP also includes contingencies for addressing additional contamination should it be identified as an unexpected find or during the additional investigation work.

We are of the opinion that the site can be made suitable for the proposed development via remediation and the implementation of this RAP. A validation report is to be prepared on completion of remediation activities for each development stage and submitted to the determining authority to demonstrate that each stage is suitable for the proposed use following completion of remediation/validation. If contaminated material is capped on site (e.g. if the capping contingency needs to be implemented), a long-term Environmental Management Plan (EMP) will also be prepared as part of the validation documentation.

JKE has undertaken a preliminary assessment of the remediation Category with regards to the Category 1 remediation triggers in Clause 4.8 of State Environmental Planning Policy (Resilience and Hazards) 2021. We consider that none of the Category 1 triggers have been met and therefore we have assessed that the remediation falls within Category 2. This should be confirmed by the client's expert planner.

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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**
Before You Dig Australia	**BYDA**
Below Ground Level	**BGL**
Benzene, Toluene, Ethylbenzene, Xylene	**BTEX**
Benzene, Toluene, Ethylbenzene, Xylene, Naphthalene	**BTEXN**
Cation Exchange Capacity	**CEC**
Contaminated Land Management	**CLM**
Contaminant(s) of Potential Concern	**CoPC**
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Conceptual Site Model	**CSM**
Development Application	**DA**
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Data Quality Objective	**DQO**
Detailed Site Investigation	**DSI**
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Ecological Screening Level	**ESL**
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Excavated Natural Material	**ENM**
Environment Protection Authority	**EPA**
Environmental Site Assessment	**ESA**
Fibre Cement Fragment(s)	**FCF**
Human Health Risk Assessment	**HHRA**
Health Investigation Level	**HILs**
Health Screening Level	**HSL**
Health Screening Level-Site Specific Assessment	**HSL-SSA**
International Organisation of Standardisation	**ISO**
JK Environments	**JKE**
JK Geotechnics	**JKG**
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**
Photo-ionisation Detector	**PID**
Protection of the Environment Operations	**POEO**
Practical Quantitation Limit	**PQL**
Quality Assurance	**QA**
Quality Control	**QC**
Remediation Action Plan	**RAP**
Review of Environmental Factors	**REF**
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**
Standard Penetration Test	**SPT**
Standing Water Level	**SWL**
Toxicity Characteristic Leaching Procedure	**TCLP**
Total Recoverable Hydrocarbons	**TRH**
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**
Millilitres	**ml or mL**
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 prepare a Remediation Action Plan (RAP) for the proposed MPS Stage 5 development at Blayney District Hospital, 3 Osman Street, Blayney, NSW ('the site'). The site location is shown on Figure 1 and the RAP applies to the land within the site boundaries as shown on Figure 2 attached in Appendix A.

This RAP has been prepared to demonstrate that the site can be made suitable for the proposed hospital development via remediation, with regards to Chapter 4 of State Environmental Planning Policy (Resilience and Hazards) 2021[1] (formerly known as SEPP55). It is understood that the RAP will support the Review of Environmental Factors (REF) for the proposed development.

JKE has previously undertaken a Desktop Preliminary Site Investigation, a Preliminary Site Investigation (PSI) and a Detailed Site Investigation (DSI) at the site. A summary of these investigations and other relevant information is provided in Section 2. The investigations identified a redundant underground storage tank (UST) in the eastern part of the site, along with the occurrence of asbestos in soil.

Our geotechnical division, JK Geotechnics (JKG), has undertaken a geotechnical investigation for the proposed development[2]. The JKG report should be read in conjunction with this RAP.

1.1 Proposed Development Details

Limited development details have been provided at this stage. Based on the supplied information, it is understood that the hospital will be redeveloped in three stages (Stage 1, Stage 2 and Stage 3) as shown on Figures 6 and 7 in Appendix A. The existing buildings will be demolished and new buildings will be constructed, along with new walkways, roads/driveways, carparks and minor landscaping works.

Earthworks drawings have not been provided, however, preliminary discussions with the project team indicated that relatively minor cut/fill earthworks will occur to create level building platforms and for new services. Although, raising of the site (filling) may also be necessary depending on the outcome of flood studies which were still underway at the date of preparing this RAP.

1.2 Aims and Objectives

The goal of the remediation is to reduce contamination-related risks to human health and the environment, and to render the site suitable for the proposed development from a contamination viewpoint.

The primary aims of the remediation are to mitigate risks from asbestos, and to remove the UST, any associated infrastructure and any localised impacted soil within the vicinity of the UST.

The objectives of this RAP are to:

- Document the requirements for pre-remediation (data gap) investigation;

[1] *State Environmental Planning Policy (Resilience and Hazards) 2021* (NSW) (referred to as SEPP Resilience and Hazards 2021)
[2] JKG, (2023). *Report to Health Infrastructure on Geotechnical Investigation for Proposed MPS Stage 5 at Blayney District Hospital, Osman Street, Blayney NSW*. (Ref: 35521LFrpt, dated 2 February 2023) (referred to as JKG report)

- Provide a rationale to support the extent of the proposed remediation and the remedial/site validation approach based on the current dataset;
- Document a methodology that is to be implemented to remediate and validate the site; and
- Document a strategy that can be implemented in the event of uncovering any unexpected, contamination-related finds, and provide other relevant contingency plans.

1.3 Scope of Work

The RAP was prepared 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 a review of the previous JKE reports, review of additional supplied documentation as referenced in Section 2.1, consultation with the client and their nominated project manager, and preparation of a RAP.

The scope of work was undertaken with reference to the National Environmental Protection (Assessment of Site Contamination) Measure 1999 as amended (2013)[3], Consultants Reporting on Contaminated Land (2020)[4] guidelines, other guidelines made under or with regards to the Contaminated Land Management Act (1997)[5] and SEPP Resilience and Hazards 2021. A list of reference documents/guidelines is included in Appendix F.

[3] National Environment Protection Council (NEPC), (2013). *National Environmental Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013).* (referred to as NEPM 2013)
[4] NSW EPA, (2020). *Consultants reporting on contaminated land, Contaminated Land Guidelines.* (referred to as Consultants Reporting Guidelines)
[5] Contaminated Land Management Act 1997 (NSW) (referred to as CLM Act 1997)

2 SITE INFORMATION

2.1 Background and Summary of Site History Information

2.1.1 Desktop

A Desktop contamination investigation was undertaken by JKE in November 2022[6]. The Desktop included a review of site information, including background and site history information from various sources, and a site walkover inspection. A summary of the site history provided below:

Table 2-1: 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 above-ground storage tank (AST) (circa 1999); and • Installation and use of grease trap (ongoing). Surrounding Area: • Ongoing residential development; and • Adjacent NSW Ambulance premises, remediation/removal of associated diesel UST and bowser (circa 2010).

During the site inspection, a NSW Health representative (Brian Harvey) from the hospital indicated that a 500L diesel 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).

[6] JK Environments, (2022a). *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)

Based on the information reviewed and the site inspection, JKE identified the following potential contamination sources/areas of environmental concern (AEC): fill material – unknown origin; fuel storage onsite – abandoned diesel UST and 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 (bedrock); 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 was 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 the 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.

2.1.2 Preliminary Site Investigation (PSI)

An intrusive Preliminary Site Investigation (PSI) was undertaken by JKE in December 2022[7] to address the first recommendation of the Desktop. 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.

The boreholes encountered fill materials (i.e. historically imported or placed soils) to depths of approximately 0.3m below ground level (BGL) 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 contaminants of potential concern (CoPC). Chromium and asbestos (as asbestos fines [AF]/fibrous asbestos [FA]) were identified in fill/soil at concentrations that exceeded the health-based site assessment criteria (SAC). In groundwater, total recoverable hydrocarbons (TRH) F2 was reported above the health-based SAC and zinc was reported above the ecological SAC.

[7] JK Environments, (2022b). *Report to Health Infrastructure on Preliminary (Stage 1) Site Investigation for Proposed MPS Stage 5 Development at 3 Osman Street, Blayney, NSW.* (Ref: E35521PTrpt2, dated 23 December 2022) (referred to as PSI)

Asbestos was not identified in the natural soil samples analysed for the PSI. Rock was not encountered to the maximum depth of investigation, 6.45mBGL, during the PSI.

The PSI did not identified contamination that would preclude the proposed development/use of the site. However, the report indicated that a DSI was required to facilitate development of a RAP and remediation would be required to render the site suitable for the proposed development.

2.1.3 Detailed Site Investigation (DSI)

A DSI was undertaken by JKE in June 2023[8]. Soil sampling occurred from 23 boreholes positioned in accessible areas, soil vapour sampling from two vapour implants in the vicinity of the UST, and groundwater sampling from six monitoring wells (three new and three existing).

The boreholes drilled for the DSI encountered fill materials to depths of approximately 0.1mBGL to 1.4mBGL, underlain by silty or clayey residual soils. The fill contained inclusions of ironstone, igneous and sandstone gravel, sand, glass, slag, ash, mulch and root fibres. There were no FCF/ACM identified in any of the bulk asbestos quantification field screening samples.

A ground penetrating radar (GPR) scan of the area in the vicinity of the redundant UST identified one suspected UST with an approximate capacity of ~2,000L (the estimated size was contrary to the initial advice during the Desktop).

In summary, the DSI concluded that:

- There were potential health-based risks associated with asbestos (found only during the PSI), arsenic and hexavalent chromium in fill soil. The health-based risks associated with the heavy metals in fill soils were considered likely to be low, however further risk assessment was required. Ecological risks from fill soil were assessed to be low and acceptable;
- Potential risks associated with groundwater at the site were assessed to be low in the context of the proposed development and were not indicative of site contamination that warranted remediation; and
- Risks associated with soil vapour were also assessed to be low, however, further sampling and risk assessment was required to confirm this.

The following was recommended:

1. Prepare an asbestos management plan (AMP) to manage asbestos in soil risks in the context of the on-going use of the site as a hospital. This AMP will need to remain in force until the redevelopment occurs;
2. Prior to preparation of the RAP, a preliminary site-specific human health risk assessment (HHRA) is to be undertaken by a specialist consultant;
3. Preparation and implementation of a RAP. In addition to the remediation and validation of fill and the UST area, the RAP is to include requirements for a post-demolition investigation(s) to adequately address the data gaps discussed in the DSI report (see Section 4 of this RAP for details of the data gaps);

[8] JK Environments, (2022a). *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)

4. Following the additional investigation(s), the HHRA is to be updated and finalised. Should the final HHRA alter the strategies or the extent of remediation defined in the RAP, an addendum RAP must be prepared and implemented;
5. Preparation of a validation assessment report for the remediation works undertaken at the site.

The DSI also recommended that a Hazardous Building Materials Assessment (HAZMAT) must be undertaken for the existing buildings/structures at the site prior to the commencement of demolition work (if one had not already been undertaken). It is understood that this had already occurred and JKE was recently provided with a copy of the Hazardous materials audit prepared by Envirowest Consulting[9].

A copy of the PSI and DSI borehole logs and laboratory results summary tables is attached in Appendix B for reference purposes.

2.1.4 Nova Enviro Reports

A temporary carpark was constructed in the eastern portion of the site as part of an early works program which commenced in April 2022. Nova Enviro prepared a Soil Sampling & Waste Classification Report[10] which was provided to JKE following issue of the DSI report.

The Nova Enviro Waste Classification investigation included trenching and soil sampling within the proposed temporary car park area. The area was divided into eight 'grids' and a 4-5m long trench was excavated through each grid. Bulk (10L) samples were collected and were reportedly screened in the field for the presence of asbestos. Samples were also obtained for laboratory analysis for waste classification purposes. Background asbestos air monitoring was also undertaken. In summary:

- Asbestos debris were identified in half of the trenches. The asbestos was reported to be in the bonded/non-friable form (i.e. ACM). Building debris including brick, mortar, concrete, glass, plastic etc were also widespread in fill throughout the area;
- Natural soils were reported beneath the fill at depths of approximately 0.2-0.7mBGL;
- The 10L bucket weights were not recorded and it was unclear to JKE whether all fragments of ACM found during the bulk sampling were weighed and reported within the laboratory analysis report. Nova Enviro did not calculate ACM concentrations or assess the data with regards to the methods adopted in the NEPM (2013);
- Eight soil samples were analysed for a range of contaminants for waste classification purposes. JKE note that contaminant concentrations were generally low from a human health risk perspective, with the exception of one lead in soil result that was 360mg/kg. This lead concentration was marginally above the most sensitive (land use Type A) criteria of 300mg/kg presented in Schedule B1 of NEPM (2013). All hexavalent chromium concentrations were <1mg/kg;
- Asbestos concentrations reported in the laboratory analysis samples were all <0.001%w/w;
- All asbestos air fibre monitoring results were <0.01 fibres/millilitre (mL) of air; and

[9] Envirowest Consulting, (2022). *Hazardous materials audit.* (Ref: R15064hm, dated 14 November 2022). (referred to as Envirowest Consulting Hazardous materials audit)
[10] Nova Enviro, (2023a). *Soil Sampling & Waste Classification Report.* (Ref: WST1479R02, dated 3 April 2023) (referred to as Nova Enviro Waste Classification)

- Excavation works were recommended to be undertaken under controlled conditions by a Class A or Class B licensed asbestos removal contractor.

JKE was subsequently provided with a Non-Friable Asbestos Removal Air Monitoring & Visual Clearance Report prepared by Nova Enviro[11]. Nova Enviro was engaged by the builder to undertake asbestos air fibre monitoring and provide a visual clearance report following the completion of asbestos removal within the temporary car park area. The approximate extent of this area is shown on Figure 7 in Appendix A. In summary:

- Approximately 300m^3 of "*non-friable asbestos contaminated soils*" was removed from the area and disposed off-site;
- The inspection/clearance related to the entire removal area and the areas immediately adjoining this area. The clearance stated that "*It was found that the visible asbestos contamination, as per the scope of works, had been, satisfactorily remediated from the above areas*";
- All asbestos air fibre monitoring results were <0.01 fibres/millilitre (mL) of air;
- It was not clear in the report whether all fill was removed from the area, however, JKE's interpretation of the findings was that all fill was not completely removed and there was a potential for ACM to remain. This is supported by the recommendations made by Nova Enviro which included recommendations for installing geotextile fabric in the trenches to provide separation between the soils below and workers, and more broadly including the installation of geotextile to the excavation area to provide separation between the soils and workers at the construction site. JKE has not been provided with any documentation confirming whether or not this occurred; and
- Soil sampling was reportedly undertaken to establish the potential for cross contamination adjacent to the excavated area. Six samples appeared to have been undertaken on the western and eastern sides of the excavation area (it was unclear whether this occurred from the excavation walls, however, JKE suspect rather that these samples were taken from the ground surfaces adjoining the excavation). All six samples reported asbestos concentrations <0.001%w/w.

2.2 Site Identification

Table 2-2: Site Identification

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 Area (LGA):	Blayney Shire Council
Current Zoning:	R1: General Residential

[11] Nova Enviro, (2023b). *Non-Friable Asbestos Removal Air Monitoring & Visual Clearance Report.* (Ref: CLR1491R02, dated 27 April 2023) (referred to as Nova Enviro clearance)

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
Site Plans:	Appendix A

2.3 Summary of Site Setting and Description

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.

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.

The most recent site walkover was undertaken by JKE as part of the DSI on 17 May 2023. 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 (i.e. day patient, not childcare) 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.

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 grease trap was also observed at the rear of the main hospital building (refer to Figure 2).

As noted during the previous site inspection for the PSI, 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.

Surface water flows would be expected to flow to the north-east in keeping with the localised fall of the site. Several surface drains were observed in the paved sections of the site and these would be expected to drain into the regional stormwater systems.

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.

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).

3 SUMMARY OF GEOLOGY AND HYDROGEOLOGY

3.1 Regional Geology and Soil Landscapes

Regional geological information reviewed for the previous investigations 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 mapped as being located approximately 300m 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.

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

A summary of the subsurface conditions encountered during the DSI is presented in the following table:

Table 3-1: Summary of Subsurface Conditions - DSI

Profile	Description
Pavement	Asphaltic Concrete (AC) pavement was encountered at the surface in BH107, BH115, BH116 BH117 and BH122 and was 10mm to 30mm in thickness.
Fill	Fill was encountered at the surface or beneath the pavement in all boreholes and extended to depths of approximately 0.1mBGL to 1.4mBGL. BH103, BH104, BH110, BH115, SV1 and SV2 were terminated in the fill at a maximum depth of approximately 1.2mBGL. The fill typically comprised silty clay, silty clayey sand, gravelly clay, and gravelly sand with inclusions of ironstone, igneous and sandstone gravel, sand, glass, slag, ash, mulch and root fibres. No odours or staining were recorded in the fill material during field work. No FCF/ACM was encountered in the fill material during fieldwork.
Natural Soil	Natural residual silty clay or silty gravelly clay was encountered beneath the fill material in boreholes BH101, BH102, BH105 to BH109, BH111 to BH114, BH116 to BH122, and extended to the maximum termination depth of the investigation at 8mBGL. No odours or staining were recorded in the natural soils during field work.
Groundwater	Groundwater seepage was not encountered in any of the boreholes during drilling. Standing water levels (SWLs) were measured in BH101, BH116, and BH117 on completion of drilling at between 6.5mBGL and 7mBGL. All other boreholes remained dry on completion and a short time after drilling.

3.2 Hydrogeology and Surface Water Bodies

Hydrogeological information reviewed for the previous investigations 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 1mBGL to 30mBGL.

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 445m to the north-east of the site. The Belubula River proper is located approximately 795m to the north-east of the site at its closest point.

A summary of the groundwater conditions during the DSI is provided below:

Table 3-2: Summary of Groundwater Conditions

<table>
<tr><th>Aspect</th><th>Details</th></tr>
<tr><td>Groundwater Depth & Flow</td><td>SWLs measured in the monitoring wells installed at the site ranged from 2.48mBGL to 4.28mBGL during the DSI. Survey levels of the wells ranged from 873.42mAHD to 876.22mAHD. Groundwater RLs calculated on these measurements ranged from 869.14mAHD to 873.74mAHD.

<table>
<tr><th>MW reference</th><th>Reduced Level (mAHD)</th><th>SWLs</th><th>SWL (mAHD)</th></tr>
<tr><td>MW12</td><td>875.46</td><td>3.60</td><td>871.86</td></tr>
<tr><td>MW14</td><td>875.15</td><td>3.0</td><td>872.15</td></tr>
<tr><td>MW15</td><td>876.22</td><td>2.48</td><td>873.74</td></tr>
<tr><td>MW101</td><td>873.42</td><td>4.28</td><td>869.14</td></tr>
<tr><td>MW116</td><td>873.90</td><td>3.16</td><td>870.74</td></tr>
<tr><td>MW117</td><td>874.01</td><td>2.81</td><td>871.20</td></tr>
</table>

A contour plot was prepared for the groundwater levels as shown on Figure 5 in Appendix A. 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-east. This was consistent with expectations based on the topography and the location of the Belubula River, and was also consistent with the groundwater flow direction modelled in the PSI.</td></tr>
<tr><td>Groundwater Field Parameters</td><td>Field measurements recorded during sampling were as follows:
- pH ranged from 5.57 to 6.85;
- EC ranged from 171.5µS/cm to 1,380µS/cm;
- Eh ranged from 124.2mV to 185.2mV; and
- DO ranged from 1.7mg/L to 5.4mg/L.</td></tr>
</table>

Aspect	Details
	The PID readings in the monitoring well headspace recorded during sampling ranged from 0.2ppm in MW12 to 1.4ppm in MW116.
Light non-aqueous phase liquids (LNAPL)	Phase separated product (i.e. LNAPL) was not detected using the interphase probe during groundwater sampling.
Groundwater contaminants	The groundwater samples collected for the DSI encountered concentrations of zinc and chromium above the ecological SAC (refer to Figure 4). The zinc exceedances were generally consistent across the monitoring well network and are considered to be associated with regional factors. The chromium concentration in MW116 may be attributed to the occurrence of elevated chromium in fill at this location. However, the DSI noted that the exceedance of the ecological SAC was very minor (i.e. the MW116 chromium concentration was 4µg/L and the SAC for chromium is 3.3µg/L) and there are no nearby receiving waterbodies which could be easily impacted. The SAC for freshwater ecological SAC for hexavalent chromium is slightly lower at 1µg/L and hexavalent chromium analysis did not occur on groundwater samples. Nevertheless, there was not considered to be a valid and complete source-pathway-receptor (SPR) linkage due to the distance of nearby water bodies and ecological risks from chromium are considered to be low and acceptable. The Australian Drinking Water Guidelines 2011 (updated 2021)[12] SAC for hexavalent chromium is 50µg/L and all reported concentrations of chromium in groundwater were well below this concentration. The pH of the groundwater from MW115, MW116 and MW117 was outside the range generally accepted for both human health and ecological receptors. The DSI noted that where (i.e. if) temporary construction dewatering is required, it is expected that the management of such water would occur in accordance with the regulatory requirements so that no unacceptable construction-phase risks occur. Remediation of groundwater was not proposed

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

4 CONCEPTUAL SITE MODEL / SITE CHARACTERISATION

NEPM (2013) defines a CSM as a representation of site related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. The CSM for the site is presented in the following sub-sections and is based on the site information and investigation data to date. Reference should also be made to the figures attached in the appendices.

It is noted that a site-specific HHRA has been recommended. The CSM must be reviewed once this assessment is complete and prior to the commencement of remediation.

4.1 Sources of Contamination and Contaminants of Concern

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

Source / AEC	Contaminants
Fill material – The site has been historically filled to achieve the existing levels. The fill may have been imported from various sources and could be contaminated. It is possible that the 'fill' is site won soil that has been pushed around/placed during previous earthworks.	Sampling has not occurred in the building footprints and other areas that were inaccessible during the previous investigations. CoPC in these areas include: 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.	TRH, BTEX and naphthalene (BTEXN). A broader suite of VOCs is being considered in relation to soil vapour based on the findings of the DSI.
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. Asbestos (both friable and bonded) and lead paint were identified in the buildings within the Envirowest Consulting Hazardous materials audit. Asbestos was identified in fill soil in one location during the PSI (BH3) and further occurrence of asbestos was identified in this same area by Nova Enviro. However, this area was excavated and asbestos impacted soils were removed from the site for construction of the temporary car park.	Asbestos, lead and PCBs.
Naturally Occurring Asbestos – A medium risk of naturally occurring asbestos is mapped within 300m of the site. Asbestos was not detected in natural soil samples analysed for the previous investigations. Sampling/analysis of bedrock for asbestos did not	Asbestos (bedrock).

Source / AEC	Contaminants
occur during as bedrock was not encountered to the maximum borehole depth of 7.45m.	

The RAP includes provisions for a pre-remediation (data gap) investigation which is to occur after demolition, and the RAP also reiterates the need for a site-specific HHRA. The outcome of these works will be used to reassess, and where required, identify the need for any further remediation. Notwithstanding, the remedial/management actions proposed in this RAP focus on the following:

- Removal of the UST and any associated impacted soils surrounding this area; and
- Management of potential asbestos risks during construction (asbestos remediation may also be required depending on the outcome of the additional investigations).

Based on the available data, we consider it likely that further occurrences of asbestos will be identified and the RAP includes contingencies to address this. However, at this stage the RAP has been prepared on the basis that asbestos concentrations are below the Health Screening Level (HSL) for land use type A presented in Schedule B1 of NEPM (2013). Hence, remediation of known asbestos contamination is not currently proposed.

Regarding the AF/FA (asbestos) identified in BH3 during the PSI, it appears likely that this material was removed from the site during the temporary car park works (see Figure 7 in Appendix A). JKE has considered this in the context of the additional data obtained during the DSI and also by Nova Enviro. In our opinion, the occurrence of AF/FA appears to be minor and not representative of the broader soil conditions in this area of the site. The soils in this area appear to be impacted by bonded ACM and sporadic occurrences of AF/FA can often be found co-located with ACM. Asbestos as AF/FA was not identified in any other samples collected from the site, therefore, we agree with the Nova Enviro assessment that the asbestos impact at BH3/at the temporary car park area is associated with bonded (non-friable) ACM.

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

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

Table 4-2: CSM for RAP

Potential mechanism for contamination	The mechanisms for contamination include 'top-down' impacts, spills and subsurface release. The subsurface release mechanism applies only to the UST area.
Affected media	Soil has been identified as affected medium in the context of the RAP. Asbestos fibres can also mobilise to air. Soil vapour is not considered to be an affected medium under the RAP. However, soil vapour is deemed to be potentially affected until the HHRA and pre-remediation (data gap) investigation confirms there are no unacceptable risks. Groundwater is not considered to be affected medium under the RAP. However, further groundwater investigation may be required if significant/mobile soil contamination is identified during the pre-remediation (data gap) investigation.

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. Ecological receptors include terrestrial organisms and plants within unpaved areas (including any proposed landscaped areas).
Potential exposure pathways and mechanisms	Potential exposure pathways relevant to the human receptors include ingestion, dermal absorption and inhalation of dust, asbestos fibres and vapours. The potential for exposure would typically be associated with the construction and excavation works, and future use of the site. 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/open space, inhalation of airborne asbestos fibres during soil disturbance, or inhalation of vapours within enclosed spaces such as buildings. The following have been identified as potential exposure mechanisms in the context of the RAP: • Contact (dermal, ingestion or inhalation) with soils during construction or with exposed soils in landscaped areas and/or unpaved areas; • Vapour intrusion into the proposed buildings; and • Possible disturbance of asbestos-containing natural bedrock formations during piling activities.
Presence of preferential pathways for contaminant movement	None identified. To be reviewed in the event mobile contamination impacts are encountered during the pre-remediation (data gap) investigation.

4.3 Data Gaps

A review of data gaps is provided below:

Table 4-3: Review of CSM and Data Gap Assessment

Source/AEC	Review and Summary of Data Gaps
HHRA	The DSI recommended that a site-specific HHRA be undertaken. This had not occurred at the date of preparing this RAP and has been reiterated as part of the pre-remediation (data gap) requirements specified in Section 6.
Fill material	Due to the access constraints, probabilistic/grid-based sampling was not practicable on this site at the time of the PSI/DSI. It is also noted that sampling occurred from boreholes which poses limitation for identifying asbestos in fill, and sampling was not undertaken beneath the buildings/structures. Further investigation of the fill is required following demolition of the buildings/structures and when access becomes available to assess the full extent of risks associated with fill. Further investigation will occur following demolition of the buildings as part of the pre-remediation (data gap) investigation requirements specified in Section 6.
Fuel Storage	Sampling was not undertaken in the tank pit area (i.e. within the tank pit backfill) of the redundant UST due in part to access limitations associated with underground services. Residual contamination may be localised to the tank pit area and around any associated infrastructure/pipework etc.

Source/AEC	Review and Summary of Data Gaps
	Sampling around the AST did not occur during the PSI or DSI due to access constraints. Data gaps associated with the UST will be addressed as part of the remediation and validation process. The data gap associated with the AST area will be addressed via the additional soil sampling proposed following demolition of the buildings, as part of the pre-remediation (data gap) investigation requirements specified in Section 6. We consider there is a low potential for impacts at the AST location as the generator stores a relatively small quantity of fuel within a self-contained unit and there was no staining in the area.
Use of Pesticides	Sampling beneath the building/structure footprint and/or in close proximity to the building/structure was not undertaken due to access constraints. Further investigation will occur following demolition of the buildings as part of the pre-remediation (data gap) investigation requirements specified in Section 6.
Hazardous Building Materials	A hazardous building materials survey was undertaken and reference is to be made to the Envirowest Consulting Hazardous materials audit. ACM impacts in soil may be associated with historical demolition activities and may extend beyond the area of the temporary carpark shown on Figure 7 in Appendix A. Further investigation will occur following demolition of the buildings as part of the pre-remediation (data gap) investigation requirements specified in Section 6.
Naturally occurring asbestos in bedrock	A medium risk of naturally occurring asbestos is mapped within 300m of the site. Sampling/analysis of bedrock for asbestos did not occur during the PSI or DSI as bedrock was not encountered to the maximum borehole depth of 7.45m. It is unclear whether the proposed development will include any piling activities that disturb bedrock. Sampling and analysis of any bedrock waste generated during the development must be undertaken if bedrock is to be disturbed and to confirm the waste classification of this material prior to off-site disposal.

5 EXTENT OF REMEDIATION AND REMEDIATION OPTIONS

5.1 Extent of Remediation

As the RAP includes provisions for managing unexpected finds, completing further investigation, managing asbestos, and for remediating the UST area. The RAP applies to the whole site and all development works within each development stage. Reference is to be made to Figure 7 in Appendix A which shows the asbestos impacted area at BH3 that was previously excavated to construct the temporary carpark, and the proposed UST remediation area.

The extent of remediation associated with the UST is expected to include the UST itself and any contents, associated infrastructure such as pipework, impacted tank pit backfill, and any unacceptably impacted soils at the base and walls of the tank pit. The horizontal and vertical extent of remediation associated with the UST is to be confirmed via the validation processes. However, results to date suggest that any associated impacts will be relatively localised.

The potential occurrence of asbestos in soil will need to be managed as part of the construction activities. The need for asbestos remediation will be evaluated as part of the pre-remediation (data gap) investigation process.

A review of the remediation extent is to occur upon completion of the HHRA and following the pre-remediation (data gap) investigation. The RAP includes a suitable framework to address any additional risks that may be identified in this context.

5.2 Soil Remediation Options Assessment

The NSW EPA follows the hierarchy set out in NEPM 2013 for the remediation of contaminated sites. The preferred order for soil remediation and management is as follows:

1. On-site treatment of soil so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable level;
2. Off-site treatment of excavated material so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable level, after which the soil is returned to the site;

Or if the above are not practicable:

3. Consolidation and isolation of the soil by on-site containment within a properly designed barrier; and
4. Removal of contaminated material to an approved site or facility, followed where necessary by replacement with clean material; or
5. Where the assessment indicates that remediation would have no net environmental benefit or would have a net adverse environmental effect, implementation of an appropriate management strategy.

For simplicity herein, the above hierarchy are respectively referred to as Option 1, Option 2, Option 3 etc.

The NEPM 2013 and the associated Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2021)[13] prefer the following asbestos remediation hierarchy:

1. Minimisation of public risk;
2. Minimisation of contaminated soil disturbance; and
3. Minimisation of contaminated material/soil moved to landfill.

The NSW EPA Contaminated Land Management Guidelines for the NSW Site Auditor Scheme (3rd Edition) (2017)[14] provides the following additional requirements to be taken into consideration:

- Remediation should not proceed in the event that it is likely to cause a greater adverse effect than leaving the site undisturbed; and
- Where there are large quantities of soil with low levels of contamination, alternative strategies should be considered or developed.

The table below discusses a range of remediation options:

Table 5-1: Consideration of Soil Remediation Options

Option	Discussion	Applicability
<u>Option 1</u> **On-site treatment of contaminated soil**	On-site treatment can provide a mechanism to reuse the processed material, and in some instances, avoid the need for large scale earthworks. Treatment options are contaminant-specific and can include bio-remediation, soil washing, air sparging and soil vapour extraction and thermal desorption. Depending on the treatment option, licenses may be necessary for specific individual waste streams due to the potential for air pollution and the formation of harmful by-products during incineration processes. Licences for re-use of treated material/waste may also be required.	Bioremediation is potentially applicable for hydrocarbon impacted soil associated with the UST area. However, bioremediation can be slow for aged TRH impacts and heavier fraction TRHs, and for soils impacted by diesel. This would not be the preferred method if small quantities of soil are involved as the costs for handling, managing and validating this process would likely exceed costs for disposal of the material as waste. Treatment of soils impacted with bonded ACM is applicable for surficial or localised impacts. However, we note that the NSW EPA released a position statement[15] relating to the WA DoH 2021 guidelines and indicated that treatment of soils via physical removal of ACM (otherwise known as 'emu picking') is not permitted, unless the impact is surficial (i.e. in the top 10cm only). A revised draft position statement is currently out

[13] 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)
[14] NSW EPA, (2017). *Contaminated land Management, Guidelines for the NSW Site Auditor Scheme (3rd ed.).* (referred to as Site Auditor Guidelines 2017)
[15] https://www.epa.nsw.gov.au/your-environment/contaminated-land/other-contamination-issues/managing-asbestos-in-and-on-land/position-statement-wa-managment-of-asbestos-sites

Option	Discussion	Applicability
		for public comment and appears to imply that treatment of ACM via picking is acceptable in some scenarios where the soils are remaining on site.
Option 2 **Off-site treatment of contaminated soil**	Contaminated soils are excavated, transported to an approved/licensed treatment facility, treated to remove/stabilise the contaminants then returned to the subject site, transported to an alternative site or disposed to an approved landfill facility. This option is also contaminant-specific. The cost per tonne for transport to and from the site and for treatment is considered to be relatively high. The material would also have to be assessed in terms of suitability for reuse as part of the proposed development works under the waste and resource recovery regulatory framework.	Not considered to be applicable for asbestos and for the small-scale remediation of hydrocarbon impacts from the UST at the site.
Option 3 **Consolidation and isolation of impacted soil by cap and containment**	This would include capping material in-situ beneath appropriate barriers, or the consolidation of contaminated soil within an appropriately designed cell, followed by the placement of an appropriate barrier over the material to reduce the potential for future disturbance. The capping and/or containment must be appropriate for the specific contaminants of concern. Depending on the concentrations of contaminants being encapsulated, an ongoing Environmental Management Plan (EMP) may be required and an EMP would need to be publicly notified and made to be legally enforceable (e.g. via listings in the Section 10.7 planning certificate and on the land title).	Applicable for asbestos where the asbestos concentrations exceed the HSLs, and also applicable for the other CoPC provided there is no migration risk to groundwater. Although this is not preferred if the contaminants are volatile. This is not the preferred method if relatively small quantities of contaminated soils are involved.
Option 4 **Removal of contaminated material to an appropriate facility and reinstatement with clean material**	Contaminated soils would be classified in accordance with NSW EPA guidelines for waste disposal, excavated and disposed of off-site to a licensed landfill. The material would have to meet the requirements for landfill disposal. Landfill gate fees would apply in addition to transport costs.	Most applicable considering the relatively small quantities of soil expected to be remediated for the UST. Also applicable for small quantities of asbestos contaminated soils if asbestos concentrations are found to exceed the HSLs. This may not be viable for larger quantities of material and would not be preferred for material with low asbestos concentrations (below the HSLs).

Option	Discussion	Applicability
<u>Option 5</u> Implementation of management strategy	Contaminated soils would be managed in such a way to reduce risks to the receptors and monitor the conditions over time so that there is an on-going minimisation of risk. This may occur via the implementation of monitoring programs, potentially also involving capping systems.	Not considered to be applicable for the small-scale remediation at the site with regards to the UST area. This is a potential option for managing low concentrations of asbestos (below the HSLs) in soil, or for managing capped contamination in conjunction with Option 4.

5.3 Rationale for the Preferred Option for Remediation

The preferred option for remediation of the UST area is Option 4 (excavation and off-site disposal). This will include decommissioning and removal of the UST and associated infrastructure, and excavation and off-site disposal of any localised contaminated soils in the vicinity of the UST. This option provides for a relatively short remediation program and aims to eliminate the need for long-term management of hydrocarbon contamination via a long-term, contamination-related EMP.

In relation to the asbestos in fill, a management approach is to be implemented to manage risks to workers during construction. The findings of the pre-remediation (data gap) investigation will establish whether there are any asbestos concentrations in soil that exceed the HSLs (or any other contaminants) and that warrant remediation. Depending on the nature and extent of such remediation, we consider that Option 4 would most likely be applicable for small quantities of contaminated soils, and a combination of Options 3 and 5 would be applicable for larger quantities of contaminated soils.

6 REMEDIATION DETAILS

Prior to commencement of demolition and any soil disturbance, the client, project manager and remediation contractor must review and make arrangements to meet the remediation site management requirements for the project as outlined in Section 9 of this RAP.

The following general sequence of works is anticipated:

- HHRA (to be completed as soon as practicable);
- Pre-commencement meeting;
- Site establishment and demolition;
- Pre-remediation (data gap) investigation and any additional associated reporting;
- Remediation of the UST area;
- Validation of remedial works and validation of imported soil materials. This includes materials imported to reinstate the remedial excavations, together with engineering material such as sub-base and drainage materials (e.g. recovered aggregate etc), landscaping materials or any other materials imported for service trenches etc, to the point in time that the validation report is issued.

It is acknowledged that the site will be redeveloped in three stages. The stages are shown on the attached Figures 6 and 7 in Appendix A. The works outlined in this RAP can be tailored to align with the development stages, however, it is noted that the HHRA is an overarching process applicable to the site as a whole.

Validation of the works will occur progressively throughout the remediation program. Each stage must be remediated and validated independently as each stage of works occurs so that the validation assessment occurs prior to occupancy/use of the respective stage area.

Details in relation to the above are outlined in the respective subsection below.

6.1 Roles and Responsibilities

Table 6-1: Roles and Responsibilities

Role	Responsibility
Developer/ client	NSW Health Infrastructure The client (or their nominated project manager) is required to appoint the project team for the remediation/validation and must provide all investigation reports including this RAP to the project manager, remediation contractor/principal contractor, and any other relevant parties involved in the project.
Project Manager	The APP Group The project manager is required to review all documents prepared for the project and manage the implementation of the procedures outlined in this RAP. The project manager is to take reasonable steps so that the remediation contractor and others have understood the RAP and will implement it in its totality. The project manager will review the RAP and other documents and will update the parties involved of any changes to the development or remediation sequence (in consultation with the validation consultant).

Role	Responsibility
Principal Contractor / Remediation Contractor	To be confirmed. The principal contractor is required to review all documents prepared for the project and manage the implementation of the procedures outlined in this RAP. The principal contractor is to take reasonable steps so that the remediation contractor and others have understood the RAP and will implement it in its totality. With regards to the need for a construction/remediation phase AMP, the principal contractor/remediation contractor must engage a (and/or engage with a) suitably qualified consultant to prepare the AMP required in accordance with Section 9.1 of this RAP. The principal contractor will review the RAP and other documents and will update the parties involved of any changes to the development or remediation sequence (in consultation with the validation consultant).
Remediation Contractor	To be confirmed. The remediation contractor (this may be the same entity as the principal contractor) is required to review all relevant documents prepared for the project, apply for any relevant removal licences or permits and implement the remediation requirements and relevant validation requirements (that are the remediation contractor's responsibility) outlined in this RAP. The remediation contractor should be or must subcontract a Class B licensed asbestos removalist to manage and undertake any works associated with the removal/disturbance of asbestos. The Class B contractor will need to submit the required notification to SafeWork NSW for asbestos removal works, should removal of asbestos in soils occur. In JKE's opinion, it would be prudent for the asbestos removal contractor to be Class A and B licensed in the event that friable asbestos is identified in soil. With regards to the need for a construction/remediation phase AMP, the remediation contractor must engage a (and/or engage with a) suitably qualified consultant to prepare the AMP required in accordance with Section 9.1 of this RAP, unless this responsibility is already addressed by the principal contractor as noted above. The remediation contractor is required to collect all documentation associated with the remediation activities and forward this documentation onto the principal contractor, client and project manager as they become available.
Validation Consultant	To be confirmed. The validation consultant[16] provides consulting advice and validation services in relation to the remediation. The validation consultant undertakes the pre-remediation (data gap) investigation(s) and prepares the validation report (and EMP where applicable), as required.

[16] The validation consultant must be a certified practitioner (specialising in site contamination), under one of the NSW EPA endorsed certification schemes, i.e. CEnvP SC or equivalent

Role	Responsibility
	The validation consultant is required to review any deviation to this RAP or any unexpected finds if and when encountered during the site work. The validation consultant should have a Licensed Asbestos Assessor (LAA) on staff. The validation consultant is required to liaise with the principal contractor, client, project manager and remediation contractor on all matters pertaining to the site contamination, remediation and validation, carry out the required pre-remediation (data gap) investigation, validation sampling and inspections.

6.2 HHRA

A specialist consultant is to be engaged to undertake a site specific HHRA, as per the recommendations of the DSI. In the event that the HHRA identifies any additional risks not adequately addressed under the purview of this RAP, a revised (or addendum) RAP must be prepared.

6.3 Pre-commencement Meeting

The project team is to have a pre-commencement meeting to discuss the sequence of remediation, and the remediation and validation tasks. The site management plan for remediation works (see Section 9) must be reviewed by project manager and remediation contractor, and appropriate steps are to be taken to ensure the adequate implementation of the plan.

6.4 Pre-remediation (Data Gap) Investigation and Reporting

Prior to the commencement of the pre-remediation (data gap) investigation, the validation consultant must prepare a detailed SAQP in accordance with the Consultants Reporting Guidelines and NEPM (2013). The SAQP must be tailored to the relevant works within each development stage. The SAQP is to include a review of the relevant earthworks plans and proposed development plans which we expect should be available at that time. In the event that the proposed development includes deep piling that will extend to bedrock, the pre-remediation (data gap) investigation scope should be expanded so that sampling and analysis of the bedrock occurs for asbestos.

Reference is to be made to Figure 6 in Appendix A for the proposed investigation locations, and to Appendix C which includes the proposed test pit location coordinates.

The investigation(s) must include the following as a minimum:

- Preparation and implementation of a suitable Work Health and Safety (WHS) plan that considers the potential for identifying asbestos during the sampling;
- Soil sampling from test pits from the proposed locations presented on Figure 6 in Appendix A. The test pits must be excavated to the base of the fill and at least 0.5m into the natural soil;
- Soil samples must be collected from each fill profile for laboratory analysis, and one sample from each location should be collected from the underlying natural soil. If there are any indicators of contamination in the natural soil (e.g. staining or odours) then deeper sampling should occur;
- Bulk (10L) field asbestos quantification must occur in accordance with the NEPM (2013) requirements;

- An additional round of soil vapour sampling/analysis for TRH/BTEX and VOCs at locations SV1 and SV2 (see Figure 6 in Appendix A). In the event that the vapour wells are damaged or cannot be located, they must be reinstalled in accordance with the specification documented in the DSI;
- A sample from each fill profile is to be analysed for the CoPC for fill as nominated in the CSM. Any FCF identified in the bulk samples are also to be analysed for asbestos;
- If there is a to be a surplus of materials on the project, or if waste is to be disposed off-site, additional analysis for waste classification purposes must occur;
- Appropriate QA/QC samples are to be obtained and analysed for soil and soil vapour, with regards to the NEPM (2013) requirements; and
- Use of appropriate SAC for the Tier 1 risk assessment (note that these SAC should be established based on the outcome of the HHRA).

On completion of the investigation(s), a report is to be prepared by the validation consultant in accordance with the Consultants Reporting Guidelines and is to include a Tier 1 risk assessment and review of the CSM. The Tier 1 risk assessment must be reviewed in the context of the conclusions of the HHRA and, where contamination risks are identified, the HHRA is to be updated. If there is any doubt regarding the outcome of the Tier 1 risk assessment and the need to update HHRA, the validation consultant is to liaise with the specialist consultant who prepared the HHRA and obtain advice regarding whether the update is necessary. It is not anticipated that an update of the HHRA will be necessary if contaminant concentrations are below what has been reported to date.

Following completion of the above, the validation consultant is to review the extent of remediation and if additional risks are identified that warrant remediation outside the scope of this RAP, then a revised (or addendum) RAP must be prepared by the validation consultant and submitted to the client/determining authority, project manager and remediation contractor etc (as applicable). The client/determining authority and project manager must then establish the appropriate course of action in relation to any additional planning/consent requirements prior to making arrangements to carry out the additional works.

The project team must factor the above requirements into the project timeline so that all of the above can be closed out/finalised prior to the commencement of earthworks/construction.

6.5 Site Establishment and Demolition

The remediation contractor is to establish on site as required to facilitate the remediation and validation works. Consideration must be given to the work sequence and extent of remediation/excavation so that the site establishment (e.g. site sheds, fencing, access points etc) does not inhibit the required works. Any soil/gravel-type materials imported during the site establishment (e.g. DGB, 40/70 etc) must be validated in accordance with Section 7 of this report.

The demolition of buildings/structures etc must occur with regards to the findings of the Envirowest Consulting Hazardous materials audit (or any other relevant hazardous building materials survey/reports for the site) and in accordance with the relevant guidelines, codes and standards. It is anticipated that there will be >10m^2 of asbestos material, hence the relevant SafeWork NSW notification for removal and waste tracking will apply. Friable asbestos was also reported in the buildings.

As part of the demolition process, all visible FCF/ACM must be removed from the ground surface prior to any works that disturb the existing pavements. An asbestos surface clearance must be provided by a LAA to demonstrate this has occurred. This ground surface clearance will be in addition to any specific clearances associated with the demolition works.

All waste from the demolition is to be disposed to facilities that are licenced by the NSW EPA to accept the waste. The demolition contractor is to maintain adequate records and retain all documentation for such activities including:

- A summary register including details such as waste disposal dates, waste materials descriptions, disposal locations (i.e. facility details) and reconciliation of this information with waste disposal docket numbers;
- Waste tracking records and transport certificates (where waste is required to be tracked/transported in accordance with the regulations); and
- Disposal dockets for the waste. Legible dockets are to be provided for all waste materials so they can be reconciled with the register.

The above information is to be supplied to the validation consultant for assessment and inclusion in the site validation report.

6.6 Remedial Actions

6.6.1 Remediation of USTs and Soils

The UST and associated infrastructure (i.e. pipe work etc) are to be removed from the site in accordance with the Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation (2019)[17], Guidelines for the Implementation of the Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2008 (2009)[18] (yet to be updated to reflect the new Regulation) and the Australian Standard for The Removal and Disposal of Underground Petroleum Storage Tanks (AS4976-2008)[19]. Reference is also to be made to the UPSS Technical Note: Decommissioning, Abandonment and Removal of UPSS (2010)[20] and the UPSS Technical Note: Site Validation Reporting (2010)[21].

It is noted that various guidelines are outdated and/or are currently being updated to reflect the UPSS Regulation 2019. The remediation is to occur in accordance with the current regulation and best practice guidelines available when the remediation commences.

[17] *Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2019* (NSW). (referred to as UPSS Regulation 2019)
[18] NSW DECC, (2009). *Guidelines for the Implementation of the Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2008.* (referred to as UPSS Guidelines 2009)
[19] Standards Australia, (2008). *The Removal and Disposal of Underground Petroleum Storage Tanks.* (referred to as AS4976-2008)
[20] NSW DECCW, (2010). *UPSS Technical Note: Decommissioning, Abandonment and Removal of UPSS*
[21] NSW DECCW, (2010). *UPSS Technical Note: Site Validation Reporting*

Table 6-2: Remediation – UST and Surrounding Soils

Step	Primary Role/ Responsibility	Procedure
1.	Remediation contractor	Address Stability Issues and Underground Services: Geotechnical advice must be sought regarding the stability of the adjacent structures and/or adjacent areas prior to commencing remediation (as required). Stability issues, particularly associated with the adjacent buildings, should be addressed to the satisfaction of a suitably qualified geotechnical engineer. This may require the installation of temporary shoring. All underground services are to be appropriately disconnected or rerouted (or protected/stabilised) to facilitate the works.
2.	Remediation contractor	Personal Protective Equipment (PPE) and WHS: Confirm PPE and WHS requirements prior to commencement of remediation works. The minimum PPE required for the remediation includes the following: • Disposable gloves; • Hard hat; • Covered clothing; and • Steel toed boots. Depending on the levels of odours or vapours, appropriate half or full-face respirations may be required and should be made available.
3.	Remediation contractor (or their nominated sub-contractor) Validation consultant (inspections)	Initial Preparation: It is believed that the UST is beneath a grassed area. However, it is possible that the tank (or associated impacted soils) extends beyond the grassed area. Where applicable, the pavement in the remediation area is to be cut and removed with care using an excavator, or similar. An experienced contractor is to be engaged for the removal of the USTs. Liquid and/or sludge within the USTs and associated pipe work is to be pumped out and disposed of lawfully by a licensed liquid waste operator prior to moving or removing the tank. Once the liquid has been removed, break out the anchor weights and recycle these along with pavement materials. Retain all waste classification and disposal documentation and provide to the validation consultant for inclusion in the validation report. The validation consultant is to be present to inspect these works.
4.	Remediation contractor (or their nominated sub-contractor) and validation consultant	Removal of the UST/infrastructure, impacted soils, followed by validation: The UST and associated infrastructure are to be removed by an experienced contractor in accordance with AS4976-2008 and with regards to the Work Health and Safety Regulation (2017). Following removal, remediation of the area will be undertaken as follows: • The backfill soils (most likely to be sandy fill) surrounding the USTs are to be excavated and stockpiled separately. All stockpiles should be placed on builder's plastic on the adjacent hardstand with appropriate silt control. This material is to be validated by the validation consultant for waste classification purposes as outlined in Section 7; • Submit an application to dispose of the backfill soil (in accordance with the assigned waste classification) to a facility that is appropriately licensed to receive the waste, and obtain authorisation to dispose; • If the validation consultant can demonstrate that the backfill does not pose an unacceptable contamination risk and there are no unacceptable aesthetic impacts, the backfill can be kept on site and used to backfill the excavation if

Step	Primary Role/ Responsibility	Procedure
		geotechnically suitable. Otherwise, load the backfill soil onto trucks and dispose in accordance with the assigned waste classification; • Depending on the contamination status of the backfill, excavation of additional material at the base and walls of the tank pit may be required. This should initially involve excavation/chase-out of material to extend the pit (say 0.5m initially) in the direction of the suspected impact. The validation consultant must be present during the excavation to provide advice on the potential extent of contamination based on visual and olfactory indicators, and photo-ionisation detector (PID) screening results; • Stockpile the additional excavated material separately to the backfill that was initially excavated, and undertake a waste classification/re-use assessment as outlined above. If the validation consultant can demonstrate that the excavated material does not pose an unacceptable contamination risk or aesthetic impacts, the material can be kept on site and used to backfill the excavation if geotechnically suitable. Otherwise, load the soil onto trucks and dispose in accordance with the assigned waste classification; • The validation consultant is to obtain validation samples from the walls and base of the excavation in accordance with Section 7; • Document observations regarding the presence (or otherwise) of groundwater at the base of the tank pit; and • All documents including landfill disposal dockets, UST disposal/destruction dockets, liquid waste disposal etc. must be retained by the remediation contractor and forwarded to the client and validation consultant. This documentation forms a key part of the validation process and is to be included in the validation report.
5.	Remediation contractor and validation consultant	<u>Backfilling/Reinstatement of Excavations:</u> After successful validation, remedial excavations are to be reinstated with clean (validated) materials, to meet the geotechnical requirements of the project. Imported materials must be validated in accordance with the validation plan outlined in Section 7, with sampling/analysis occurring prior to importation. In the event that the tank pit backfill and/or material that is chased out of the remedial excavations is assessed appropriately and is not considered to pose an unacceptable risk to groundwater or any of the identified receptors, consideration can be given to using this material to backfill the tank pit. If this occurs, it must be documented in the validation report.

6.7 Remediation Documentation

The remediation contractor must retain all documentation associated with the site management and remediation, including but not limited to:

- Asbestos management documentation, including all relevant notifications and monitoring reports, and clearance certificates where applicable (additional details in this regard are to be outlined in the construction-phase AMP);
- Photographs of remediation works;
- Waste disposal dockets and waste tracking documentation (see below and the example waste tracking form in Appendix D);
- UST destruction certificate; and

- Imported materials documentation (see below and the example imported material tracking form in Appendix D).

Copies of these documents must be forwarded to the project manager and the validation consultant for assessment and inclusion in the validation report.

6.7.1 Waste

All waste removed from the site is to be appropriately classified, tracked and managed in accordance with the relevant guidelines and regulations. The remediation contractor (and/or their nominated licensed asbestos removalist) is to maintain adequate records and retain all documentation for waste disposal activities including:

- A summary register (in Microsoft Excel format) including details such as waste disposal dates, waste materials descriptions, disposal locations (i.e. facility details) and reconciliation of this information with the associated waste classification documentation and the waste disposal docket numbers;
- Waste tracking records and transport certificates (where waste is required to be tracked/transported in accordance with the regulations). This includes consignment details via the WasteLocate system for asbestos waste; and
- Disposal dockets for the waste (i.e. weighbridge dockets for each load).

Any soil waste classification documentation is to be prepared in accordance with the reporting requirements specified by the NSW EPA.

A review of the disposal facility's Environment Protection Licence (EPL) issued under the Protection of the Environment Operations (POEO) Act (1997)[22] is to be undertaken to assess whether the facility is appropriately licensed to receive the waste.

The above information is to be provided to the validation consultant for inclusion in the validation report. The register must be set up at the beginning of the project and provided to the validation consultant regularly so the details can be checked and any rectification of the record keeping process can occur in a timely manner.

6.7.2 Imported Materials Register

The remediation contractor (and/or their nominated construction contractor) is to maintain, for the duration of the project, an imported material register. This must include a register (in Microsoft Excel format) with details of each imported material type, supplier details, summary record of where the imported materials were placed on site, and importation docket numbers and a tally of quantities (separated for each import stream). Dockets for imported materials are to be provided electronically so these can be reconciled with the register.

Examples of imported materials for this project may include but would not be limited to: site preparation materials (e.g. DGB, 40/70, material to create the pavement base or piling platforms etc); clean capping or

[22]NSW Government, (1997). *Protection of Environment Operations Act.* (referred to as POEO Act 1997)

backfill material such as virgin excavated natural material (VENM); and landscaping materials such as topsoil garden mixes, mulches etc.

The above information is to be provided to the validation consultant for inclusion in the validation report. The register be set up at the beginning of the project and provided to the validation consultant regularly so the details can be checked and any rectification of the record keeping process can occur in a timely manner.

7 VALIDATION PLAN

Validation is necessary to demonstrate that remedial measures described in the RAP have been successful and that the site is suitable for the intended land use. The sampling program for the validation is outlined in Section 7.1. This is the minimum requirement based on the remedial strategies provided. Additional validation sampling may be required based on observations made during remediation.

7.1 Validation Sampling and Documentation

The validation requirements for the site are outlined below:

7.1.1 Validation Requirements – UST and Associated Soils

Table 7-1: Validation Requirements – UST and Associated Soils

Aspect	Sampling	Analysis	Observations and Documentation
Tank pit backfill	For waste classification purposes: One sample per 25m^3, collected using hand equipment. Minimum three samples. Samples to be collected from at least 0.5m below the surface and evenly spaced across/around the stockpile to be representative of the backfill.	Heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), TRH/BTEXN, PAHs, OCPs, PCBs and asbestos. Toxicity characteristic leachate procedure (TCLP) analysis as required.	**Validation consultant:** Samples to be screened using PID. Observations of soil/material type, staining and odour to be recorded. Photographs to be taken. Disposal dockets to be retained by the **remediation contractor**. Waste classification report to be prepared in accordance with the Consultants Reporting Guidelines and NSW EPA Waste Classification Guidelines to facilitate off-site waste disposal.
UST pit chase out spoil (if required)	For waste classification purposes: One sample per 25m^3, collected using hand equipment. Minimum three samples.	As above.	As above.
UST pit – excavation base **UST pit – excavation walls**	Minimum of two samples per UST to be collected using an excavator after removal of the tank. One sample per excavation wall and per vertical metre, with a minimum of one sample per soil stratum. No less than one sample per 5m lineal along	TRH/BTEXN.	**Validation consultant:** Samples to be screened using PID. Observations of staining and odour to be recorded. Photographs to be taken.

Aspect	Sampling	Analysis	Observations and Documentation
	continuous walls >5m long. Additional sampling is also to target obvious indicators of contamination if observed (e.g. odours, staining).		Lithology on pit walls and base to be logged. Groundwater observations to be recorded.
Pipe trenches	One sample per 5m lineal, obtained from the base of the trench. Additional samples to target any areas of staining or odours.	As above.	As above.
Beneath Bowser Plinth (if location is identified/suspected)	One sample per suspected bowser plinth location. Additional samples to target any areas of staining or odours.	As above.	As above.

7.1.2 Imported Materials

The table below outlines the validation requirements for material imported onto the site:

Table 7-2: Validation Requirements – Imported Materials

Aspect	Sampling	Analysis	Observations and Documentation
Imported VENM backfill (if required)	Minimum of three samples per source	Heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), TRHs, BTEX, PAHs, OCPs, PCBs and asbestos (500ml NEPM 2013 analysis). Additional analysis may be required depending on the site history of the source property.	**Remediation contractor** to supply existing VENM documentation/report (report to be prepared in accordance with the NSW EPA waste classification reporting requirements). A hold point remains until the **validation consultant** approves the material for importation or advises on the next steps. Material is to be inspected upon importation by the **validation consultant** to confirm it is free of visible/olfactory indicators of contamination and is consistent with documentation. Photographic documentation and an inspection log are to be maintained. Where check sampling occurs by the **validation consultant** due to deficiencies or irregularities in existing VENM documentation, the following is required: - Date of sampling and description of material sampled; - An estimate of the volume of material imported at the time of sampling; - Sample location plan; and - Analytical reports and tabulated results with comparison to the Validation Assessment Criteria (VAC).

Aspect	Sampling	Analysis	Observations and Documentation
Imported engineering materials such as recycled aggregate, road base etc **Excavated Natural Material (ENM)**	Minimum of three samples per source/material type. ENM testing must meet the specification within the ENM Order. If the analysis is not compliant, the validation consultant must carry out an ENM assessment and prepare a report in accordance with the ENM Order/Exemption prior to material being imported.	Heavy metals (as above), TRHs, BTEX, PAHs, OCPs, PCBs and asbestos (500ml quantification). As required in the ENM Order.	**Remediation contractor** to provide product specification and documentation to confirm the material has been classified with reference to a relevant Resource Recovery Order/Exemption. A hold point remains until the **validation consultant** approves the material for importation or advises on the next steps. Review of the facility's EPL, where applicable. Material is to be inspected by the **validation consultant** upon importation to confirm it is free of visible/olfactory indicators of contamination and is consistent with documentation. Where check sampling occurs by the **validation consultant** due to deficiencies or irregularities in existing documentation, the following is required: - Date of sampling and description of material sampled; - An estimate of the volume of material imported at the time of sampling; - Sample location plan; and - Analytical reports and tabulated results with comparison to the VAC.
Imported engineering materials comprising only natural quarried products.	At the validation consultant's discretion based on robustness of supplier documentation.	At the validation consultant's discretion based on robustness of supplier documentation.	**Remediation contractor** to provide documentation from the supplier confirming the material is a product comprising only natural quarried material. A hold point remains until the **validation consultant** approves the material for importation or advises on the next steps. Review of the quarry's EPL. Material is to be inspected by the **validation consultant** upon importation to confirm it is free of anthropogenic materials, visible and olfactory indicators of contamination, and is consistent with documentation. Where check sampling occurs by the **validation consultant** due to deficiencies or irregularities in existing documentation, the following is required:

Aspect	Sampling	Analysis	Observations and Documentation
			- Date of sampling and description of material sampled; - An estimate of the volume of material imported at the time of sampling; - Sample location plan; and - Analytical reports and tabulated results with comparison to the VAC.
Imported garden mix/turf underlay/topsoil	Minimum of three samples per source.	Heavy metals (as above), TRHs, BTEX, PAHs, OCPs, PCBs and asbestos (500ml). Analysis of mulch can be limited to asbestos (500ml) and visual observations to confirm there are no anthropogenic materials.	**Remediation contractor** to provide documentation from the supplier confirming the product specification. This must include a description of the Australian Standard or other relevant product specification under which the material is produced, and the components. A hold point remains until the **validation consultant** approves the material for importation or advises on the next steps. Material is to be inspected by the **validation consultant** upon importation to confirm it is free of anthropogenic materials, visible and olfactory indicators of contamination, and is consistent with documentation. The validation consultant is to review any existing/available analysis results for the materials. A minimum of one batch for each imported material type (from each individual supplier) must be inspected by the validation consultant. This inspection must be repeated for each material type from each supplier, a minimum of once per month thereafter. Where check sampling occurs by the **validation consultant** due to deficiencies or irregularities in existing documentation, the following is required: - Date of sampling and description of material sampled; - An estimate of the volume of material imported at the time of sampling; - Sample location plan; and - Analytical reports and tabulated results with comparison to the VAC.
Mulch	Minimum of three samples per source.	Asbestos (500ml).	As above.

7.2 Validation Assessment Criteria and Data Assessment

The VAC to be adopted for the validation assessment are outlined in the table below:

Table 7-3: Validation Assessment Criteria (VAC)

Validation Aspect	VAC
USTs and soils removal	The VAC for soil validation of the pipe trenches, tank pit walls and tank pit base are as follows: • Analytical results for TRH/BTEXN below the Health Screening Level A (HSL-A) criteria for soils as presented in Schedule B1 (Table 1A[3]) of NEPM 2013, applying the respective depth of the sample in relation to the ground surface level and conservatively adopting a sand soil type; and • Analytical results below the Management Limits for TRHs in an 'residential, parkland and public open space', as presented in Schedule B1 (Table 1B[7]) of NEPM 2013, with a 'fine' soil type. Any assessment of materials for on-site re-use associated with the UST validation process must consider whether there are any unacceptable aesthetic issues with the material and all results must also be below the land use Type A thresholds presented in Schedule B1 of NEPM (2013).
Imported materials	The validation of imported materials is two-fold: the validation is to demonstrate that the imported material will not pose a risk in the context of the proposed land use; and also, that the imported material meets the requirements where applicable under a relevant resource recovery exemption/order under which they are produced ENM and recycled materials are to meet the criteria of the relevant exemption/order under which they are produced. Analytical results for VENM and other imported materials will need to be consistent with expectations for those materials. For VENM, it is expected that: - Heavy metal concentrations are to be less than the most conservative Added Contaminant Limit (ACL) concentrations for an 'urban residential and public open space' (URPOS) exposure setting presented in Schedule B1 of the NEPM 2013, except for lead which should be nominally less than 100mg/kg; and - Organic compounds are to be less than the laboratory PQLs and asbestos to be absent. The lower lead VAC nominated above is based on the fact that the lead ACL is quite high and is not consistent with expectations for natural material in the area. The concentration of 100mg/kg is nominal and is considered to be protective of human health and the environment in the proposed land use setting. Whilst a lead concentration of 100mg/kg may still be relatively high for natural material from some areas, it is well below the Health Investigation Level (HIL-A) criteria applicable to sensitive land uses and is deemed to be appropriate considering the other validation requirements for imported materials. All materials imported onto the site must also be adequately assessed as being appropriate for the final use of the site. A risk-based assessment approach is to be adopted with regards to the tier 1 screening criteria presented in Schedule B1 of NEPM 2013, consistent with the approach taken for the DSI. Aesthetics: all imported materials are to be free of staining and odours.

Laboratory data are to be assessed as above or below the VAC. Statistical analysis is not proposed. Notwithstanding, statistical analysis can be applied by the validation consultant if deemed appropriate and if the analysis occurs with regards to the relevant guidelines.

7.3 Validation Sampling, Analysis and Quality Plan (SAQP)

Data Quality Objectives (DQOs) and Data Quality Indicators (DQIs) should be clearly outlined and assessed as part of the validation process. A framework for the DQO and DQI process is outlined below and should be reflected in the validation report. These relate to the remediation only and it is anticipated that the SAQP(s) for the pre-remediation (data gap) investigation(s) will include this information in the contexed of those works.

DQOs have been broadly established for the validation with regards to the seven-step process outlined NEPM (2013). The seven steps include the following which are detailed further in the following subsections:

- State the problem;
- Identify the decisions/goal of the study;
- Identify information inputs;
- Define the study boundary;
- Develop the analytical approach/decision rule;
- Specify the performance/acceptance criteria; and
- Optimise the design for obtaining the data.

DQIs are to be assessed based on field and laboratory considerations for precision, accuracy, representativeness, completeness and comparability.

7.3.1 Step 1 - State the Problem

Validation data is required to demonstrate that the remediation is successful and that the site is suitable for the proposed land use described in Section 1.1.

7.3.2 Step 2 - Identify the Decisions of the Study

The remediation goal, aims and objectives are defined in Section 1.2. The decisions to be made reflect these objectives and are as follows:

- Were the relevant reports prepared prior to commencement of the remediation (e.g. pre-remediation data gap investigation reports, HHRA, revised/addendum RAP where applicable, waste classification, AMP, etc)?
- Was the remediation undertaken in accordance with the RAP and any supplementary reports?
- If there were any deviations, what were these and how do they impact the outcome of the validation?
- Are any of the validation results above the VAC and what is the implication of this in relation to the remediation/validation and future site management?
- Is the site (or the specific development stage being assessed) suitable for the proposed development from a contamination viewpoint?

7.3.3 Step 3 - Identify Information Inputs

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

- Existing relevant data from previous reports;
- Site information, including site observations, inspections, asbestos clearance certificates (where applicable), waste and imported materials registers;
- Validation sampling and laboratory analysis results for remedial excavations and imported materials;
- Laboratory analysis (as required); and
- Field and laboratory QA/QC data.

7.3.4 Step 4 - Define the Study Boundary

The remediation and validation will be confined to the site boundaries as shown in Figure 2 in Appendix A. The remedial excavations proposed in this RAP for the UST are expected to be limited horizontally to the UST area (estimated broadly to be less than 5m by 5m in area) and less than 3m deep. The UST location is shown on Figure 7 in Appendix A. The final remediation extent will be confirmed via the validation process.

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

7.3.5.1 VAC

The validation data will be assessed in accordance with the requirements outlined in Section 7.1.

7.3.5.2 Field and Laboratory QA/QC

Field QA/QC is required for the UST validation and for imported materials. This is to include:

- Analysis of inter-laboratory duplicates (5% frequency) and intra-laboratory duplicates (5% frequency), analysed for the same analytical suite as the primary samples;
- Trip blank samples (one per batch/day of sampling), analysed for the same analytical suite as the primary samples excluding asbestos;
- Trip spike samples (one per batch/day of sampling), analysed for BTEXN, only where samples within that batch have been scheduled for analysis of TRH or BTEXN; and
- Rinsate samples (one per batch), analysed for the same analytical suite as the primary samples excluding asbestos, only where re-usable sampling equipment is utilised.

DQIs for field and laboratory QA/QC samples are defined below:

Field Duplicates

Acceptable targets for precision of field duplicates 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.

Trip Blanks
Acceptable targets for trip blank samples will be less than the PQL.

Trip Spikes
Acceptable targets for trip spike samples will be 70% to 130%.

Laboratory QA/QC
The suitability of the laboratory data will be assessed against the laboratory QA/QC criteria. These criteria are 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 typical limits 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; and
- 60-140% recovery acceptable for organics.

Surrogate Spikes
- 60-140% recovery acceptable for general organics.

Method Blanks
- All results less than PQL.

In the event that acceptable limits are not met by the laboratory analysis, other lines of evidence will be reviewed (e.g. field observations of samples, preservation, handling etc) and, where required, consultation with the laboratory is to be undertaken in an effort to establish the cause of the non-conformance. Where uncertainty exists, the validation consultant is to adopt the most conservative concentration reported.

7.3.5.3 Appropriateness of PQLs

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

7.3.6 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 to be undertaken with reference to Schedule B(3) of NEPM (2013) using the data quality assurance information collected. Data will be assessed as above or below the VAC. Statistical analysis is not proposed, therefore there have been no limits on decision errors set for validation purposes.

7.3.7 Step 7 - Optimise the Design for Obtaining Data

The design is to be optimised via the collection of validation data to demonstrate the success of the key aspects of the remediation. Data collection will be via various methods including inspections and sampling.

The proposed sampling plan for the validation is described in Section 7.1.

7.4 Validation Report

As part of the site validation process, a validation report will be prepared by the validation consultant for each development stage. The reports will present the results of the validation assessment relevant to each stage and will be prepared in accordance with the Consultants Reporting Guidelines.

It should also be noted that any material changes to the remediation or validation strategy will require an updated or addendum RAP, which in turn must be approved by the determining authority.

8 CONTINGENCY PLAN

The contingency plan for the project in the context of the site remediation is provided in the following sub-sections:

8.1 Unexpected Finds

Residual hazards that may exist at the site would generally be expected to be detectable through visual or olfactory means. At this site, these types of hazards may include additional underground tanks, visible FCF/ACM in or on soil (except for in the vicinity of BH3/the temporary carpark) or suspected friable types of asbestos such as rope or lagging, stained or odorous soils etc. The procedure to be followed in the event of an unexpected find is presented below:

- In the event of an unexpected find, all work in the immediate vicinity should cease and the remediation contractor must contact the validation consultant and the client/project manager;
- Temporary barricades should be erected to isolate the area from access to workers;
- The validation consultant is to attend the site to inspect the find;
- The validation consultant is to adequately characterise the contamination and provide advice in relation to site management and remediation. In the event that remediation differs from that outlined in this RAP, an addendum RAP must be prepared in consultation with the project stakeholders and submitted to the determining authority; and
- Contamination is to be remediated and validated in accordance with the advice provided, and the results are to be included in the validation report.

8.2 Validation Failure for UST Area

In the event of a validation failure, additional material is to be 'chased out' from the area that failed and disposed off-site, then the area re-validated. Due to the potential cost implications for disposal of additional materials, the client and project manager must be informed in the event of a validation failure, an estimate of the additional waste quantity must be provided, and approval must be sought from the client/project manager prior to any off-site disposal of waste.

8.3 Asbestos/Other Contaminated Soils – Excavation and Disposal Contingency

The following contingency has been provided for reference purposes and consideration in relation to the occurrence/identification of asbestos-contaminated soils (i.e. where soils are found to contain asbestos concentrations greater than the relevant SAC for the proposed land use). This contingency would also be appropriate in the event other CoPC are identified at unacceptable concentrations during the pre-remediation (data gap) investigation.

In the event that this contingency is to be implemented, a rationale for applying it must be documented, the details below must be reviewed and updated for the situation, and approval must be sought from the project manager/client prior to proceeding with the remedial works (i.e. within an addendum RAP). A validation plan must also be documented.

The area of remediation is to be defined and delineated prior to commencement of excavation. A waste classification must occur for the material to be excavated and removed from the area (existing/available data must be considered, together with any new data should it be required). The classification must occur with regards to the NSW EPA Waste Classification Guidelines, Part 1: Classifying Waste (2014)[23] and the NSW EPA Sampling Design Part 1 – Application (2022)[24]. A waste classification report must be prepared (see Section 6.7.1) and the receiving landfill facility should be contacted to obtain disposal approval.

The procedure for excavation and disposal of asbestos-contaminated fill is outlined in the following table:

Table 8-1: Contingency Remediation – Asbestos/Other Contaminated Soils

Step	Primary Role/ Responsibility	Procedure
1.	Remediation contractor	Address Stability Issues and Underground Services: Geotechnical advice must be sought regarding the stability of adjacent structures and/or adjacent areas prior to commencing remediation (as required). Stability issues are to be addressed to the satisfaction of a suitably qualified geotechnical engineer. This may require the installation of temporary shoring, if specified by the engineer. All underground services are to be appropriately disconnected or rerouted to facilitate the works.
2.	Remediation contractor (or nominated Class A/B licensed sub-contractor)	Establish Asbestos Related Controls and Arrange Licenses and Tracking Requirements: Prior to the commencement of any excavation, asbestos related controls, licences and tracking requirements must be implemented as outlined in the AMP (refer to Section 9 of this RAP). Any other WHS and PPE requires must also be implemented for the works.
3.	Remediation contractor (or nominated Class A/B licensed sub-contractor) Validation consultant (inspections)	Excavation and Disposal of Contaminated Soil: Remediation will be undertaken as follows: • Submit an application to dispose of the soil (in accordance with the assigned waste classification) to a facility that is appropriately licensed by the NSW EPA to receive the waste, and obtain authorisation to dispose; • The excavation and removal of asbestos-contaminated soil should be completed in accordance with the relevant AMP; • The area where soil is to be removed must be marked out using an appropriate method so the extent of remediation is clear to the excavator operator and other relevant parties; • The final extent of remediation (i.e. excavation) is to be guided by the validation consultant; • Load the fill directly into trucks and dispose of the soil to a facility licensed by the NSW EPA to receive the waste; and • All documents including landfill disposal dockets must be retained by the remediation contractor/asbestos removal contractor and forwarded to the client and validation consultant. This documentation forms a key part of the validation process and is to be included in the validation report.
4.	Validation consultant	Validation of Excavations: Once all contaminated soil is removed to required levels, the base and walls of the excavation are to be validated in accordance with a suitable validation plan.

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

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

Step	Primary Role/ Responsibility	Procedure
5.	Remediation contractor and validation consultant	Backfilling/Reinstatement of Excavations: Where required, remedial excavations are to be reinstated with clean (validated) materials, to meet the geotechnical and landscape requirements of the project. Imported materials must be validated in accordance with the validation plan outlined in Section 7, with sampling/analysis occurring prior to importation.

Part 7 of the Protection of the Environment (POEO) Waste Regulation (2014)[25] sets out the requirements for the transportation and management of asbestos waste and Clause 79 of the POEO Waste Regulation requires waste transporters to provide information to the NSW EPA regarding the movement of any load in NSW of more than 10m^2 of asbestos sheeting, or 100 kilograms of asbestos waste. To fulfil these legal obligations, asbestos waste transporters must use WasteLocate.

Clause 78 of the POEO Waste Regulation requires that a person who transports asbestos waste must ensure that:

- Any part of any vehicle in which the person transports the waste is covered, and leak-proof, during the transportation; and
- If the waste consists of bonded asbestos material—it is securely packaged during the transportation; and
- If the waste consists of friable asbestos material—it is kept in a sealed container during transportation; and
- If the waste consists of asbestos-contaminated soils—it is wetted down.

Asbestos waste cannot be re-used or recycled.

8.4 Capping Contingency

In the event that contaminated soil cannot be practicably removed, or if the quantity of contaminated material is cost-prohibitive to dispose of, an assessment must be made by the validation consultant regarding the risks posed by this material in the context of the proposed development. For hydrocarbon impacted material, it may not be possible to simply cap/contain and manage this material if it poses an unacceptable vapour risk. Therefore, further sampling, analysis and risk assessment will be required in this scenario in order to establish a suitable course of action. This contingency is well suited to asbestos contamination however.

In the event that this contingency is to be implemented, a rationale for applying it must be documented, the details below must be reviewed and updated for the situation, and approval must be sought from the project manager/client prior to proceeding with the remedial works (i.e. within an addendum RAP). A validation plan must also be documented.

In relation to asbestos, if all asbestos-contaminated fill cannot be practicably removed and disposed off-site, the fill must be capped with a robust capping layer and consequently the site and this area will be managed under a long-term EMP. The minimum capping requirements in such a circumstance are as follows:

[25] *Protection of the Environment Operations (Waste) Regulation 2019* (NSW). (referred to as POEO Waste Regulation)

- Installation of a brightly coloured (i.e. orange) geotextile marker layer over the contaminated fill;
- Installation of a minimum of 500mm of clean (validated) materials if the area is to be landscaped, and all landscaping must be shallow and must not penetrate the geotextile. If shallow landscaping is not achievable, then the capping thickness must be increased accordingly to meet this requirement; and
- In areas that are to be paved with hardstand (e.g. pavements, new building slabs etc), there is no need for 500mm of clean material and the pavements can be constructed directly over the top of the geotextile marker in accordance with the engineering requirements for the project.

The proposed remediation and validation steps associated with in-situ capping are outlined in the following table.

Table 8-2: Remediation Details – In-situ Capping Contingency

Step	Primary Role/ Responsibility	Procedure
1.	Remediation contractor/principal contractor	Service Trenching, Piling/Footing Excavations and Establishment of Pre-Capping Site Levels: The principal contractor/remediation contractor are to undertake the relevant site preparation works, piling/footing excavations and any excavations required to facilitate the capping procedures. Any surplus excavated materials must be managed and (if required) disposed off-site appropriately in accordance with the relevant requirements outlined previously in this RAP.
2.	Remediation contractor	Installation of Marker Layers and Survey of site levels: After the bulk excavation levels are achieved to facilitate the minimum capping requirements, the geotextile marker is to be installed over the fill and secured appropriately using 'U' nails, pegs or other means. A pre-capping levels survey is to be completed by the remediation contractor prior to the placement of any overlying clean capping layers or construction of pavements etc. The purpose of the survey is to provide factual information of the site levels, and the horizontal extent of the geotextile marker, prior to installation of the clean capping layers. Survey points must be taken at appropriate frequencies (say every 5m lineal for narrow areas, a 5m grid for broader areas, at the corners/edges of the geotextile, and more frequently for significant change in surface elevation. The pre-capping levels survey is to be provided to the client/project manager and the validation consultant prior to any further capping works commencing.
3.	Validation consultant and remediation contractor	Importation of Capping Materials: Imported materials are to be validated in accordance with Section 7. Validated materials can then be used to achieve the minimum capping requirements for the project.
4.	Remediation contractor	Post-Capping Survey of site levels: After completion of capping, a post-capping levels survey is to be completed by the remediation contractor. The purpose of the survey is to provide factual information regarding the capping thickness and confirm that the minimum capping requirements have been achieved.

Step	Primary Role/ Responsibility	Procedure
		Survey points must be taken at appropriate frequencies as noted for the pre-capping survey. The post-capping levels survey is to be provided to the client/project manager and the validation consultant.

Where contaminated soil is capped on site, a long-term EMP will be required to manage the contamination capped at the site and the long-term EMP will be documented as part of the overall validation process. Public notification and enforcement mechanisms for the long-term EMP are to be arranged and the determining authority (and local council, if applicable) is to be provided with a draft copy of the long-term EMP for consultation prior to finalisation of the document.

The notification and enforcement mechanisms are to include notation on the planning certificate under Section 10.7 of the Environmental Planning and Assessment Act (1979) and a covenant registered on the title to land under Section 88B of the Conveyancing Act (1919).

The long-term EMP will include requirements for passive management of the capping system that will focus on maintaining the capping layers to minimise the potential of exposure to the underlying contaminated soil. The long-term EMP will also include contingencies for managing minor intrusive works in the event that the capping system is breached.

8.5 Importation Failure for VENM or other Imported Materials

Where material to be imported onto the site does not meet the importation VAC, the material should not be imported. Alternative material must be sourced that meets the importation requirements.

8.6 Remediation Strategy Changes

Any material change to the proposed remediation strategy will require an addendum to or a revision of the RAP. This must not occur without appropriate consultation and approvals from the client/determining authority and other relevant parties.

9 SITE MANAGEMENT PLAN FOR REMEDIATION WORKS

The information outlined in this section of the RAP is for the remediation work only. The client and project manager must also make reference to the development consent for specific site management requirements for the overall development of the site.

9.1 Asbestos Management Plan (AMP)

A construction/remediation-phase AMP must be prepared for the site and implemented for the site remediation and development works. The AMP must include the minimum PPE, WHS and other requirements outlined in the documents published by Safe Work Australia, WorkCover Authority of NSW, National Occupational Health and Safety Commission, and other relevant authorities as applicable. An asbestos removal control plan (ARCP) should be prepared by the remediation contractor and issued to SafeWork, and notification of asbestos removal is to be provided to SafeWork at least five days prior to commencement of works.

The client and project team must consider the need for a post-remediation AMP for the site to fulfil their obligations under Clause 429 of the Work Health and Safety Regulation (2017). The need for a post-remediation AMP must be assessed based on the outcome of the validation.

9.2 Interim Site Management

As noted in the DSI, an interim AMP for ongoing and normal use of the site (addressing asbestos in soil) should be prepared and implemented prior to the commencement of remediation to fulfill the requirement to have an AMP in place under the Work Health and Safety Regulation (2017).

9.3 Project Contacts

Emergency procedures and contact telephone numbers should be displayed in a prominent position at the site entrance gate and within the main site working areas. The contact details of key project personnel are summarised in the following table:

Table 9-1: Project Contacts

Role	Company	Contact Details
Client	NSW Health Infrastructure	Arjuna Thiru Moorthy Project Director – Health Infrastructure T: (02) 9978 5402 M: 0433 940 767
Project Manager	The APP Group	Nick Crossingham Project Director T: (02) 4928 7600 M: 0402 543 701
Principal Contractor	To be appointed	-

Remediation Contractor	To be appointed	-
Validation Consultant	To be appointed	-
Certifier	Blackett Maguire + Goldsmith	Michael Potts Associate Director M: 0400 819 326
NSW EPA	Pollution Line	131 555
Emergency Services	Ambulance, Police, Fire	000

9.4 Security

Appropriate fencing should be installed as required to secure the site and to isolate the remediation areas. Warning signs should be erected, which outline the PPE required for remediation work.

9.5 Timing and Sequencing of Remediation Works

The anticipated sequence of remediation works is outlined at the beginning of Section 6 of this RAP. Remediation will occur concurrently with the demolition/development works to facilitate the implementation of the requirements under this RAP. The works will be staged to align with the proposed development stages.

9.6 Site Soil and Water Management Plan

The remediation contractor should prepare a detailed soil and water management plan prior to the commencement of site works and this must consider the requirements of the AMP. Silt fences should be used to control the surface water runoff at all appropriate locations of the site and appropriate measures are to be implemented to manage soil/water disturbance to the satisfaction of the regulator/determining authority. Reference should be made to the REF for further details.

All stockpiled materials should be placed within an erosion containment boundary with silt fences and sandbags employed to limit sediment movement. The containment area should be located away from drainage lines/low-points, gutters, stormwater pits and inlets and the site boundary. No liquid waste or runoff should be discharged to the stormwater or sewerage system without the approval of the appropriate authorities.

9.7 Noise and Vibration Control Plan

The guidelines for minimisation of noise on construction sites outlined in AS-2460 (2002)[26] should be adopted. Other measures specified in the consent conditions should also be complied with. Noise producing machinery and equipment should only be operated between the hours approved by the determining authority (refer to REF).

[26] Australian Standard, (2002). *AS2460: Acoustics - Measurement of the Reverberation Time in Rooms.*

All practicable measures should be taken to reduce the generation of noise and vibration to within acceptable limits. In the event that short-term noisy operations are necessary, and where these are likely to affect residences, notifications should be provided to the relevant authorities and the residents by the project manager, specifying the expected duration of the noisy works.

9.8 Dust Control Plan

All practicable measures should be taken to reduce dust emanating from the site. Factors that contribute to dust production are:

- Wind over a cleared surface;
- Wind over stockpiled material; and
- Movement of machinery in unpaved areas.

Visible dust should not be present at the site boundary. Measures to minimise the potential for dust generation include:

- Use of water sprays on unsealed or exposed soil surfaces;
- Covering of stockpiled materials and excavation faces (particularly during periods of site inactivity and/or during windy conditions) or alternatively the erection of hessian fences around stockpiled soil or large exposed areas of soil;
- Establishment of dust screens consisting of a 2m high shade cloth or similar material secured to a chain wire fence;
- Maintenance of dust control measures to keep the facilities in good operating condition;
- Stopping work during strong winds;
- Loading or unloading of dry soil as close as possible to stockpiles to prevent spreading of loose material around the development area; and
- Geofabric could be placed over exposed soils in the event that excavation is staged.

If stockpiles are to remain on-site or soil remains exposed for a period of longer than several days, dust monitoring should be undertaken at the site. If excessive dust is generated all site activities should cease until either wind conditions are more acceptable or a revised method of excavation/remediation is developed.

Dust is also produced during the transfer of material to and from the site. All material should be covered during transport and should be properly disposed of on delivery. No material is to be left in an exposed, un-monitored condition.

All equipment and machinery should be brushed or washed down before leaving the site to limit dust and sediment movement off-site. In the event of prolonged rain and lack of paved areas all vehicles should be washed down prior to exit from the site, and any soil or dirt on the wheels of the vehicles removed. Water used to clean the vehicles should be collected and tested prior to appropriate disposal under the relevant waste classification guidelines.

Reference is also to be made to the AMP in this regard.

9.9 Dewatering

Temporary dewatering is not anticipated to be required as part of the scope of remediation works. If a rain event occurs during the construction, this water should be managed appropriately on site in accordance with the remediation contractor's soil and water management plan. This water should not be pumped to stormwater or sewer unless a prior application is made and this is approved by the relevant authorities.

9.10 Air Monitoring

Air monitoring details must be outlined as part of the AMP to be prepared for the construction/remediation works. Air monitoring must only be carried out by personnel registered and accredited by NATA (National Association of Testing Authorities). Filter analysis must only be carried out within a NATA certified laboratory. The monitoring results must conform to the requirements of the NOHSC Guidance note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2nd Edition [NOHSC:3003 (2005)].

A monitoring program will be used to assess whether the control procedures being applied are satisfactory and that criteria for airborne asbestos fibre levels are not being exceeded. The following levels will be used as action criteria during the air monitoring:

- <0.01 Fibres/ml: Work procedures deemed to be successful;
- 0.01 to 0.02 Fibres/ml: Inspection of the site and review of procedures; and
- >0.02 Fibres/ml: Stop work, inspection of the site, review of procedures, clean-up, rectification works where required and notify the relevant regulator.

9.11 Odour Control Plan

All activities undertaken at the site should be completed in a manner that minimises emissions of smoke, fumes and vapour into the atmosphere and any odours arising from the works or stockpiled material should be controlled. Control measures may include:

- Maintenance of construction equipment so that exhaust emissions comply with the Clean Air Regulations issued under the POEO Act 1997;
- Demolition materials and other combustible waste should not be burnt on site;
- The spraying of a suitable proprietary product to suppress any odours that may be generated by excavated materials; and
- Use of protective covers (e.g. builder's plastic).

All practicable measures should be taken to reduce fugitive emissions emanating from the site so that associated odours do not constitute a nuisance and that the ambient air quality is not adversely impacted. The following odour management plan should be implemented to limit the exposure of site personnel and surrounding residents to unpleasant odours:

- Excavation and stockpiling of material should be scheduled during periods with low winds if possible;
- A suitable proprietary product could be sprayed on material during excavation and following stockpiling to reduce odours (subject to an appropriate assessment of the product by the validation consultant);

- All complaints from workers and neighbours should be logged and a response provided. Work should be rescheduled as necessary to minimise odour problems;
- The site foreman should consider the following odour control measures as outlined in NEPM:
  - reduce the exposed surface of the odorous materials;
  - time excavation activities to reduce off-site nuisance (particularly during strong winds); and
  - cover exposed excavation faces overnight or during periods of low excavation activity.
- If continued complaints are received, alternative odour management strategies should be considered and implemented.

9.12 WHS Plan

A site specific WHS plan must be prepared by the remediation contractor for all work to be undertaken at the site. The WHS plan should meet all the requirements outlined in SafeWork NSW WHS regulations.

As a minimum requirement, personnel must wear appropriate protective clothing, including long sleeve shirts, long trousers, steel cap boots and hard hats. Additional asbestos-related PPE will be required and this will be specified in the AMP. Washroom and lunchroom facilities should also be provided to allow workers to remove potential contamination from their hands and clothing prior to eating or drinking.

9.13 Waste Management

Prior to commencement of remedial works and excavation for the proposed development, the remediation contractor should develop a waste management plan to minimise the amount of waste produced from the site and promote recycling of building materials such as concrete pavement to the extent practicable.

9.14 Incident Management Contingency

The validation consultant should be contacted if any unexpected conditions are encountered at the site. This should enable the scope of remedial/validation works to be adjusted as required. Similarly, if any incident occurs at the site (e.g. a fuel spill during refuelling of machinery), the validation consultant should be advised to assess potential impacts on contamination conditions and the remediation/validation timetable.

9.15 Hours of Operation

Hours of operation should be between those approved by the determining authority under the development approval process (refer to the REF).

9.16 Community Consultation and Complaints

The remediation contractor should provide details for managing community consultation and complaints within their construction plans.

10 CONCLUSIONS

Investigations have identified a redundant UST in the eastern section of the site. Risks from soil contamination were predominantly assessed to be low in the DSI report, however, asbestos has been identified in fill/soil and parts of the site have been inaccessible to date and need to be investigated when access becomes available (i.e. after demolition of buildings). The outcome of these further investigations and a site-specific HHRA will be used to establish whether any additional remediation is required (as specified in Section 6 of this RAP).

The proposed development will occur in three stages and this RAP includes provisions for carrying out the required activities and reporting to align with the development stages. The RAP outlines requirements for remediation of the UST area by removing the tank and any associated infrastructure, excavating any localised contaminated soil, and disposing of this to a licensed landfill facility.

A construction/remediation-phase AMP will be in place to manage potential asbestos risks to workers and adjacent land users. Although the PSI identified one location (BH3) containing asbestos at a concentration that exceeded the SAC, the BH3 area was subsequently excavated and the material was disposed off-site when constructing the temporary carpark. Therefore, asbestos remediation is not proposed in this RAP and the need for asbestos remediation will be further assessed following the investigations that must occur after the demolition of the buildings.

The RAP also includes contingencies for addressing additional contamination should it be identified as an unexpected find or during the additional investigation work.

We are of the opinion that the site can be made suitable for the proposed development via remediation and the implementation of this RAP. A validation report is to be prepared on completion of remediation activities for each development stage and submitted to the determining authority to demonstrate that each stage is suitable for the proposed use following completion of remediation/validation. If contaminated material is capped on site (e.g. if the capping contingency needs to be implemented), a long-term EMP will also be prepared as part of the validation documentation.

The RAP has met the objectives outlined in Section 1.2.

10.1 Remediation Category

JKE has undertaken a preliminary assessment of the remediation Category with regards to the Category 1 remediation triggers in Clause 4.8 of SEPP Resilience and Hazards 2021. We consider that none of the Category 1 triggers have been met and therefore we have assessed that the remediation falls within Category 2. This should be confirmed by the client's expert planner.

10.2 Regulatory Requirements

The regulatory requirements applicable for the remediation are discussed in the following table:

Table 10-1: Regulatory Requirement

Guideline / Legislation / Policy	Applicability
SEPP Resilience and Hazards 2021	Prior notice of Category 2 remediation work is required with regards to Clauses 4.13 at least 30 days before the commencement of work. A notice of completion of remediation work is to be given to the local council within 30 days of completion of the work, in accordance with Clauses 4.14 and 4.15 of SEPP Resilience and Hazards 2021.
POEO Act 1997	Section 143 of the POEO Act 1997 states that if waste is transported to a place that cannot lawfully be used as a waste facility for that waste, then the transporter and owner of the waste are each guilty of an offence. The transporter and owner of the waste have a duty to ensure that the waste is disposed of in an appropriate manner. Appropriate waste tracking is required for all waste that is disposed off-site. Activities should be carried out in a manner which does not result in the pollution of waters.
POEO (Waste) Regulation 2014	Part 7 of the POEO Waste Regulation 2014 set outs the requirements for the transportation and management of asbestos waste and Clause 79 of the POEO Waste Regulation requires waste transporters to provide information to the NSW EPA regarding the movement of any load in NSW of more than 10 square meters of asbestos sheeting, or 100 kilograms of asbestos waste. To fulfil these legal obligations, asbestos waste transporters must use WasteLocate.
Work Health and Safety Regulation (2017)	Sites with asbestos become a 'workplace' when work is carried out there and require a register and AMP. Appropriate SafeWork NSW notification will be required for licensed (Class B) asbestos removal works or handling. Reference is to be made to the remediation/construction-phase AMP for further details regarding the regulatory requirements for managing asbestos during remediation.
SafeWork NSW Code of Practice: How to manage and control asbestos in the workplace (2019)	Sites with asbestos become a 'workplace' when work is carried out there and require a register and AMP. Appropriate SafeWork NSW notification will be required for licensed asbestos removal works or handling (e.g. Class B for non-friable asbestos removal).
NSW EPA Guidelines on the Duty to Report Contamination under Section 60 of the CLM Act 1997	The requirement to notify the EPA should be assessed as part of the site validation process. The need to notify will be largely dependent on the asbestos air monitoring results during the remediation. In our opinion the results obtained by JKE to date do not trigger a need to notify the EPA.

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: GOOGLE EARTH PRO

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

PLOT DATE: 28/06/2023 3:52:14 PM DWG FILE: K:\SC EIS \JOBS\35000\SIE35521PT BLAYNEY\CAD\NEW\E35521PT.DWG

LEGEND

APPROXIMATE SITE BOUNDARY

AERIAL IMAGE SOURCE: GOOGLE EARTH PRO

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: 28/06/2023 3:52:50 PM DWG FILE: K:\5C EIS JOBS\35000'S\E35521PT BLAYNEY\CAD\NEW\E35521PT.DWG

LEGEND

APPROXIMATE SITE BOUNDARY	
BH(Fill Depth)	BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m) (JKE, 2022)
BH/MW(Fill Depth)	BOREHOLE AND GROUNDWATER MONITORING WELL LOCATION, NUMBER AND DEPTH OF FILL (m) (JKE, 2022)
BH102	BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m) (JKE, 2023)
BH/MW101	BOREHOLE AND GROUNDWATER MONITORING WELL LOCATION, NUMBER AND DEPTH OF FILL (m) (JKE, 2023)
SV1	SOIL VAPOUR IMPLANT AND DEPTH (m) (JKE, 2023)

AERIAL IMAGE SOURCE: GOOGLE EARTH PRO

0 6 12 18 24 30

SCALE 1:600 @A3 METRES

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

Title: **PSI/DSI SAMPLE LOCATIONS**

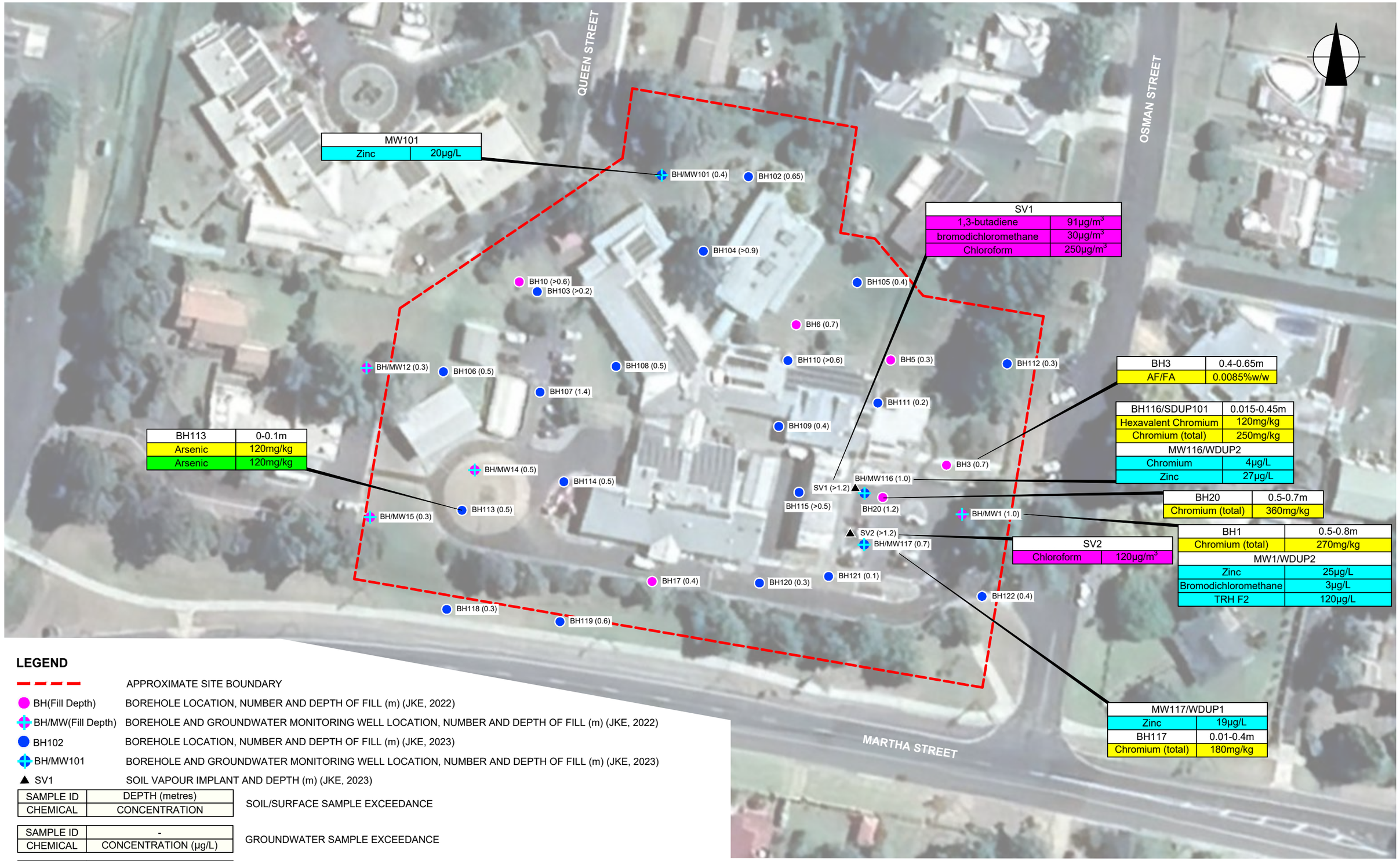
Location: BLAYNEY DISTRICT HOSPITAL, 3 OSMAN STREET, BLAYNEY, NSW

Project No: E35521PT

Figure No: 3

JKEnvironments

PLOT DATE: 28/06/2023 3:53:03 PM DWG FILE: K:\5C EIS JOBS\35000'S\E35521PT BLAYNEY\CAD\NEW\E35521PT.DWG



LEGEND

- APPROXIMATE SITE BOUNDARY
- BH(Fill Depth) — BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m) (JKE, 2022)
- BH/MW(Fill Depth) — BOREHOLE AND GROUNDWATER MONITORING WELL LOCATION, NUMBER AND DEPTH OF FILL (m) (JKE, 2022)
- BH102 — BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m) (JKE, 2023)
- BH/MW101 — BOREHOLE AND GROUNDWATER MONITORING WELL LOCATION, NUMBER AND DEPTH OF FILL (m) (JKE, 2023)
- ▲ SV1 — SOIL VAPOUR IMPLANT AND DEPTH (m) (JKE, 2023)

SAMPLE ID	DEPTH (metres)
CHEMICAL	CONCENTRATION

SOIL/SURFACE SAMPLE EXCEEDANCE

SAMPLE ID	-
CHEMICAL	CONCENTRATION (µg/L)

GROUNDWATER SAMPLE EXCEEDANCE

SAMPLE ID	-
CHEMICAL	CONCENTRATION (µg/m^3)

SOIL VAPOUR SAMPLE EXCEEDANCE

- SOIL/SURFACE CONTAMINATION ABOVE SAC FOR HUMAN HEALTH RISK
- SOIL/SURFACE CONTAMINATION ABOVE SAC FOR ECOLOGICAL RISK
- GROUNDWATER CONTAMINATION ABOVE SAC
- SOIL VAPOUR CONCENTRATION ABOVE SAC

AERIAL IMAGE SOURCE: GOOGLE EARTH PRO

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: 28/06/2023 3:53:32 PM DWG FILE: K:\5C EIS JOBS\35000\S\E35521PT BLAYNEY\CAD\NEW\E35521PT.DWG

LEGEND

APPROXIMATE SITE BOUNDARY	
BH(Fill Depth)	BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m) (JKE, 2022)
BH/MW(Fill Depth)	BOREHOLE AND GROUNDWATER MONITORING WELL LOCATION, NUMBER AND DEPTH OF FILL (m) (JKE, 2022)
BH102	BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m) (JKE, 2023)
BH/MW101	BOREHOLE AND GROUNDWATER MONITORING WELL LOCATION, NUMBER AND DEPTH OF FILL (m) (JKE, 2023)
SV1	SOIL VAPOUR IMPLANT AND DEPTH (m) (JKE, 2023)
871	GROUNDWATER CONTOUR INTERVALS (m)
	INFERRED GROUNDWATER FLOW DIRECTION

AERIAL IMAGE SOURCE: GOOGLE EARTH PRO

0 6 12 18 24 30

SCALE 1:600 @A3 METRES

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

Title: **GROUNDWATER CONTOUR PLOT**

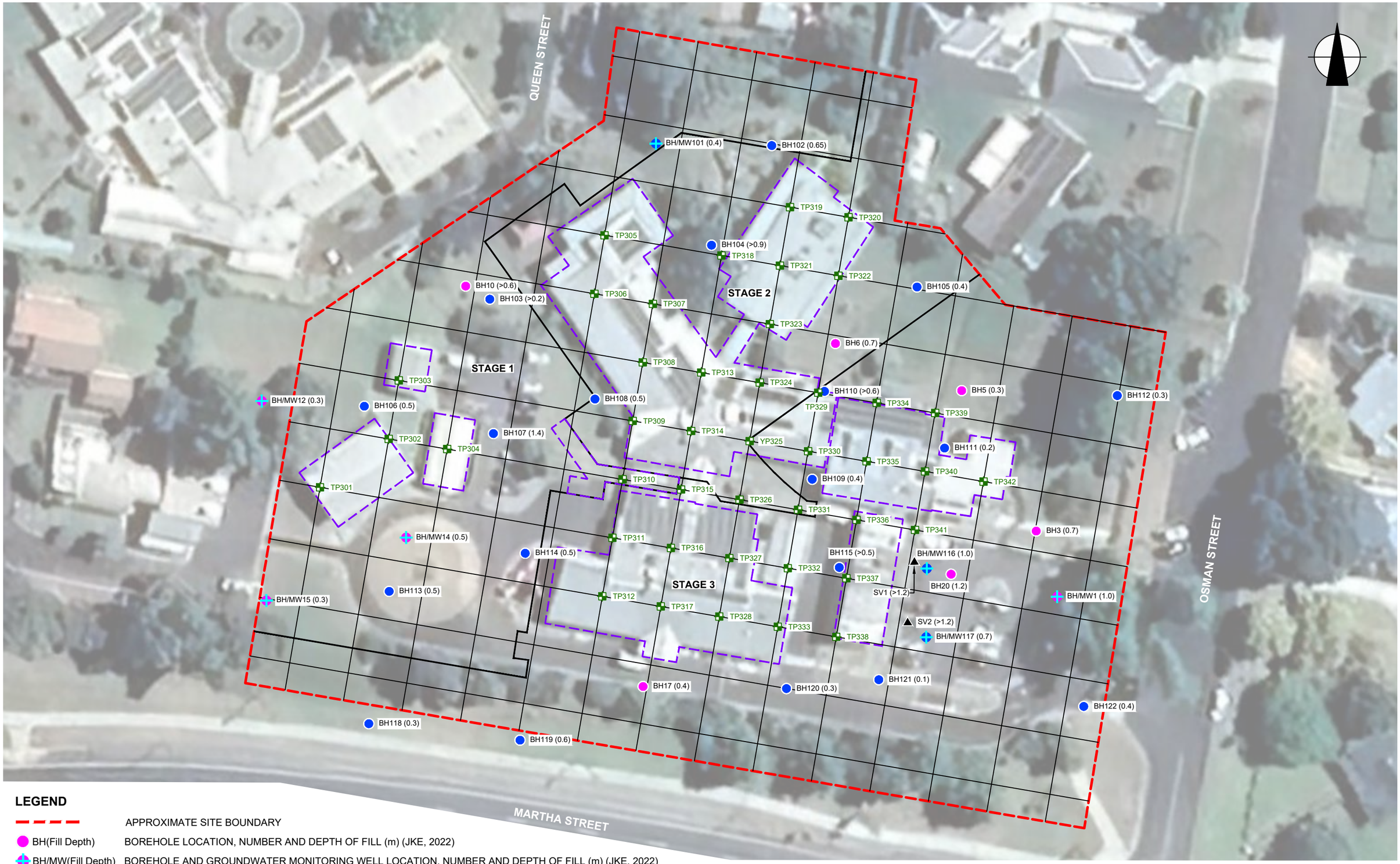
Location: BLAYNEY DISTRICT HOSPITAL, 3 OSMAN STREET, BLAYNEY, NSW

Project No: E35521PT

Figure No: 5

JKEnvironments

PLOT DATE: 28/06/2023 3:53:47 PM DWG FILE: K:\5C EIS JOBS\35000'S\E35521PT BLAYNEY\CAD\NEW\E35521PT.DWG



LEGEND

APPROXIMATE SITE BOUNDARY	
BH(Fill Depth)	BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m) (JKE, 2022)
BH/MW(Fill Depth)	BOREHOLE AND GROUNDWATER MONITORING WELL LOCATION, NUMBER AND DEPTH OF FILL (m) (JKE, 2022)
BH102	BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m) (JKE, 2023)
BH/MW101	BOREHOLE AND GROUNDWATER MONITORING WELL LOCATION, NUMBER AND DEPTH OF FILL (m) (JKE, 2023)
SV1	SOIL VAPOUR IMPLANT AND DEPTH (m) (JKE, 2023)
TP301	PROPOSED DATA GAP INVESTIGATION LOCATIONS
	PROPOSED BUILDINGS TO BE DEMOLISHED

AERIAL IMAGE SOURCE: GOOGLE EARTH PRO

0 6 12 18 24 30

SCALE 1:600 @A3 METRES

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

Title: **PROPOSED DATA GAP INVESTIGATION LOCATIONS**

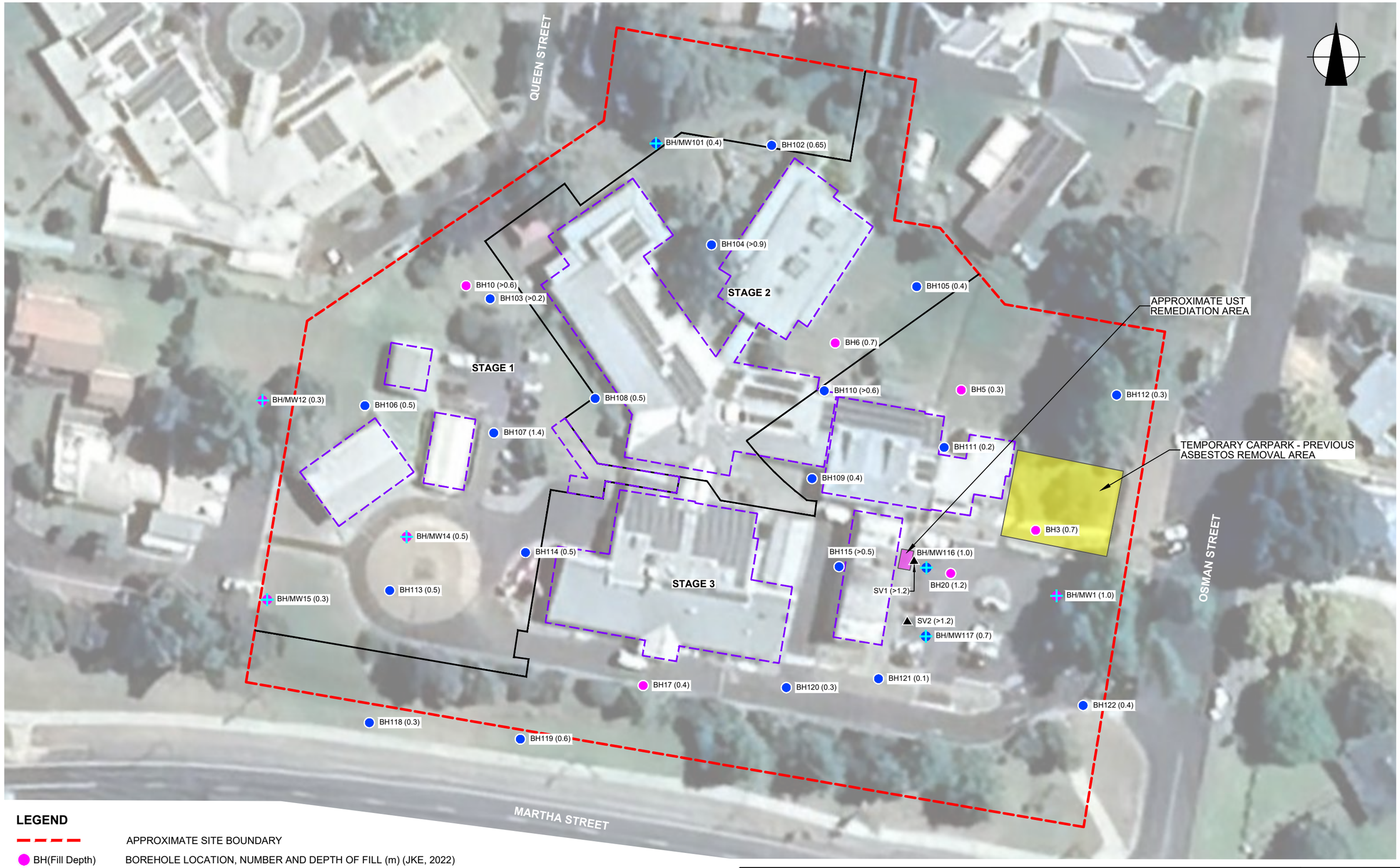
Location: BLAYNEY DISTRICT HOSPITAL, 3 OSMAN STREET, BLAYNEY, NSW

Project No: E35521PT

Figure No: 6

JKEnvironments

PLOT DATE: 30/06/2023 9:37:50 AM DWG FILE: K:\5C EIS JOBS\35000'S\E35521PT BLAYNEY\CAD\NEW\E35521PT.DWG



LEGEND

APPROXIMATE SITE BOUNDARY	
BH(Fill Depth)	BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m) (JKE, 2022)
BH/MW(Fill Depth)	BOREHOLE AND GROUNDWATER MONITORING WELL LOCATION, NUMBER AND DEPTH OF FILL (m) (JKE, 2022)
BH102	BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m) (JKE, 2023)
BH/MW101	BOREHOLE AND GROUNDWATER MONITORING WELL LOCATION, NUMBER AND DEPTH OF FILL (m) (JKE, 2023)
SV1	SOIL VAPOUR IMPLANT AND DEPTH (m) (JKE, 2023)
PROPOSED BUILDINGS TO BE DEMOLISHED	

AERIAL IMAGE SOURCE: GOOGLE EARTH PRO

0 6 12 18 24 30

SCALE 1:600 @A3 METRES

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

Title: **REMEDIATION AREA PLAN FOR RAP**

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

Project No: E35521PT

Figure No: 7

JKEnvironments

PLOT DATE: 30/06/2023 9:32:40 AM DWG FILE: K:\5C EIS JOBS\35000'S\E35521PT BLAYNEY\CAD\NEW\E35521PT.DWG

Appendix B: Laboratory Summary Tables and Logs – Previous JKE Investigations

PSI Logs

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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				FILL: Gravelly clayey sand, fine to medium grained, brown, low to medium plasticity, with fine to coarse grained igneous gravel and ash.	M			SCREEN: 10.87kg 0.05-0.5m NO FCF
						1		CL	Silty CLAY: low plasticity, light grey mottled orange brown and dark grey, trace of fine to medium grained ironstone gravel.	w>PL	VSt		SCREEN: 2.45kg 0.5-1.0m NO FCF
					N > 19 6,8, 11/100mm							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							

JKGeotechnics

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			
									FILL: Silty clay, medium to high plasticity, brown and red brown, trace of fine to coarse grained slag and igneous gravel.	w<PL			SCREEN: 10.47kg 0.1-0.4m NO FCF
								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
								CL-CI		w>PL	F-St	80 90 100	
									Clayey SILT: low plasticity, brown mottled orange brown, trace of ash.	w>PL	VSt-Hd		RESIDUAL
									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
	■			■				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
	■			■		1							
	■			■							(St-VSt)		
						2			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
								CL-CI	Silty CLAY: low to medium plasticity, light grey mottled orange brown, trace of ash and fine to medium grained igneous gravel.		(VSt -Hd)		RESIDUAL
						1				w≈PL			
									END OF BOREHOLE AT 1.65m				HAND AUGER REFUSAL ON GRAVEL
						2							
						3							
						4							
						5							
						6							
						7							

JKGeotechnics

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							

JKGeotechnics

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	
						2							
					N = 22 6,10,12	3						550 550 500	
▼ 1 DAY AFTER PUMP OUT									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.
						4							
					N = 22 8,10,12							500 550 570	
						5			as above, but with ash.				
					N = 17 6,9,8	6						400 450 500	
									END OF BOREHOLE AT 6.45m				
						7							

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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				
								-	FILL: Sand, fine to medium grained, light brown, with silt and fine to coarse grained sandstone and igneous gravel.	M			SCREEN: 4.45kg 0.05-0.5m NO FCF 4L BUCKET
					N = 19 9,8,11			CI	Silty CLAY: medium plasticity, light grey mottled orange brown and red brown, trace of fine to medium grained ironstone gravel and ash.	w>PL	Hd	>600 >600 >600	RESIDUAL
						1							
					N = 20 8,10,10							450 480 400	
						2				w≈PL			
					N = 13 6,6,7	3						500 450 470	
									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	4						350 300 320	SLIGHT ORGANIC ODOUR
						5							
					N = 8 4,4,4	6						230 250 300	
									END OF BOREHOLE AT 6.45m				
						7							

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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				w≈PL	Hd		RESIDUAL
					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							
					N = 18 7,8,10			ML	Clayey SILT: low plasticity, red brown mottled orange brown.	w<PL	Hd	430 420 450	
						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
				■				CI	FILL: Sand, fine to medium grained, light grey, with silt, fine to medium grained sandstone gravel and slag.	w≈PL	Hd		
	■		■	■	N = 22 7,10,12				Silty CLAY: medium plasticity, light grey mottled orange brown and red brown, trace of fine to medium grained ironstone gravel.			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				

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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							

DSI Logs and Data Summary Tables

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ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. BH101 1/2

SDUP103:0-0.1m

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 18/5/23 **Datum:** -

Plant Type: JK205 **Logged/Checked by:** H.W./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
						N = 6 2,1,5	0			FILL: Silty clay, low to medium plasticity, brown, trace of ironstone gravel, slag and ash.	w≈PL			GRASS COVER SCREEN: 0-0.1m 10.70kg, NO FCF SCREEN: 0.1-0.4m 2.10kg, NO FCF
						N = 16 9,9,7			CL-CI	Silty CLAY: low to medium plasticity, light brown and brown, trace of ironstone gravel.	w<PL			RESIDUAL
						N = 16 5,6,10	1							
							2		CI-CH	as above, but medium to high plasticity, brown mottled grey.				
										as above, but yellow brown and grey, trace of root fibres.				
						N = 14 5,6,8	3							
							4							
						N = 31 5,13,18	5							
						N = 16 5,7,9	6			Silty Gravelly CLAY: medium to high plasticity, red brown and brown, fine to medium grained, sub-angular igneous gravel.	w≈PL			
							7							

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ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. BH101 2/2

SDUP103:0-0.1m

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 18/5/23 **Datum:** -

Plant Type: JK205 **Logged/Checked by:** H.W./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	■					N = 10 6,5,5				Silty Gravelly CLAY: medium to high plasticity, red brown and brown, fine to medium grained, sub-angular ironstone gravel.	w≈PL			
							8			END OF BOREHOLE AT 8.0m				GROUNDWATER MONITORING WELL INSTALLED TO 8m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 2m TO 8m. CASING 0m TO 2m. 2mm SAND FILTER PACK 1.5m TO 8m. BENTONITE SEAL 1m TO 1.5m. BACKFILLED WITH SAND TO THE SURFACE. COMPLETED WITH A CONCRETED GATIC COVER.
							9							
							10							
							11							
							12							
							13							
							14							

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ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. BH102 1/1

SDUP102: 0-0.2

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 22/5/23 **Datum:** -

Plant Type: - **Logged/Checked by:** O.B./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION	■		■		■		0			FILL: Silty clay, low to medium plasticity, brown, trace of igneous gravel, mulch and root fibres.	w≈PL			MULCH COVER SCREEN: 0-0.2m 10.42kg, NO FCF
	■		■				1		CI-CH	Silty CLAY: medium to high plasticity, light grey mottled dark grey and orange.	w≈PL			RESIDUAL
										END OF BOREHOLE AT 1.2m				
							2							
							3							
							4							
							5							
							6							
							7							

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ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. BH103 1/1

SDUP101: 0-0.2

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 22/5/23 **Datum:** -

Plant Type: - **Logged/Checked by:** O.B./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	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: Silty clay, low to medium plasticity, brown, trace of igneous and ironstone gravel, and root fibres.	w≈PL			GRASS COVER
										END OF BOREHOLE AT 0.2m				SCREEN: 0-0.2m 10.12kg, NO FCF
														HAND AUGER REFUSAL
							1							
							2							
							3							
							4							
							5							
							6							
							7							

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ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **BH104** **1/1**

SDUP103: 0-0.2

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 22/5/23 **Datum:** -

Plant Type: - **Logged/Checked by:** O.B./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION	■		■		■		0			FILL: Silty clay, low to medium plasticity, dark brown, trace of igneous and ironstone gravel, leaves and root fibres.	w≈PL			LEAF COVER
											w≈PL			SCREEN: 0-0.2m 10.61kg, NO FCF
	■		■		■					FILL: Silty clay, medium to high plasticity, brown, trace of root fibres.				SCREEN: 0.4-0.6m 5.40kg, NO FCF
							1			END OF BOREHOLE AT 0.9m				HAND AUGER REFUSAL
							2							
							3							
							4							
							5							
							6							
							7							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. BH105 1/1

SDUP104: 0-0.2

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 22/5/23 **Datum:** -

Plant Type: - **Logged/Checked by:** O.B./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION	■		■		■		0			FILL: Silty clay, low to medium plasticity, brown, trace of igneous and ironstone gravel, and root fibres.	w≈PL			GRASS COVER SCREEN: 0-0.2m 10.98kg, NO FCF
	■		■						CI-CH	Silty CLAY: medium to high plasticity, light grey mottled dark grey.	w≈PL			RESIDUAL
							1			END OF BOREHOLE AT 0.9m				
							2							
							3							
							4							
							5							
							6							
							7							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **BH106** **1/1**

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** PENDULUM / AUGER **R.L. Surface:** N/A

Date: 23/5/23 **Datum:** -

Plant Type: EXCAVATOR **Logged/Checked by:** O.B./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION	■		■		■		0			FILL: Silty clay, low to medium plasticity, brown, trace of root fibres.	w≈PL			GRASS COVER SCREEN: 0-0.2m 5.01kg, NO FCF
									CI	Silty CLAY: medium plasticity, light grey mottled orange and brown.	w≈PL			RESIDUAL
	■		■				1			END OF BOREHOLE AT 1.0m				
							2							
							3							
							4							
							5							
							6							
							7							

JKEnvironments

ENVIRONMENTAL LOG

Log No. **BH107** 1/1

Environmental logs are not to be used for geotechnical purposes

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 19/5/23 **Datum:** -

Plant Type: JK205 **Logged/Checked by:** H.W./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION	■		■		■	N = 26 3,11,15	0		-	ASPHALTIC CONCRETE: 10mm.t FILL: Silty clayey sand, fine to medium grained, brown, with igneous gravel, trace of sandstone gravel.	M			SCREEN: 0.01m-1.0m 7.52kg, NO FCF
	■		■		■	N = 35 12,19,16	1							SCREEN: 1.0-1.4m 12.39kg, NO FCF
	■		■			N = 18 5,8,10			CI-CH	Silty CLAY: medium to high plasticity, orange brown and grey, trace of ironstone bands.	w≈PL			RESIDUAL
							2			END OF BOREHOLE AT 1.95m				
							3							
							4							
							5							
							6							
							7							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **BH108** **1/1**

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** PENDULUM / AUGER **R.L. Surface:** N/A

Date: 23/5/23 **Datum:** -

Plant Type: EXCAVATOR **Logged/Checked by:** O.B./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION	■		■		■		0			FILL: Silty clay, medium plasticity, brown, trace of ash and root fibres.	w≈PL			GRASS COVER 0-0.2m 7.91kg, NO FCF
									CI-CH	Silty CLAY: medium to high plasticity, light grey mottled brown.	w≈PL			RESIDUAL
	■		■				1			END OF BOREHOLE AT 1.0m				
							2							
							3							
							4							
							5							
							6							
							7							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **BH109** **1/1**

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 22/5/23 **Datum:** -

Plant Type: - **Logged/Checked by:** O.B./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION	■		■		■		0			FILL: Silty clay, low to medium plasticity, dark brown, trace of igneous and ironstone gravel, ash and root fibres.	w≈PL			GRASS COVER SCREEN: 0-0.2m 12.01kg, NO FCF
									CI-CH	Silty CLAY: medium to high plasticity, grey mottled dark grey and brown, trace of ash.	w≈PL			RESIDUAL
	■		■				1			END OF BOREHOLE AT 1.0m				
							2							
							3							
							4							
							5							
							6							
							7							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **BH110** **1/1**

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 22/5/23 **Datum:** -

Plant Type: - **Logged/Checked by:** O.B./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION	■		■		■		0			FILL: Silty clay, medium plasticity, brown, trace of igneous gravel and root fibres.	w≈PL			GRASS COVER SCREEN: 0-0.2m 11.45kg, NO FCF
										END OF BOREHOLE AT 0.6m				HAND AUGER REFUSAL
							1							
							2							
							3							
							4							
							5							
							6							
							7							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **BH111** **1/1**

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 22/5/23 **Datum:** -

Plant Type: - **Logged/Checked by:** O.B./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION	■		■		■		0			FILL: Silty clay, medium plasticity, red brown, trace of igneous and ironstone gravel and root fibres.	w≈PL			GRASS COVER
									CI-CH	Silty CLAY: medium to high plasticity, grey.	w≈PL			SCREEN: 0-0.2m 10.67kg, NO FCF RESIDUAL
										END OF BOREHOLE AT 0.7m				
							1							
							2							
							3							
							4							
							5							
							6							
							7							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **BH112** **1/1**

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 23/5/23 **Datum:** -

Plant Type: - **Logged/Checked by:** O.B./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION	■		■		■		0			FILL: Silty clay, low to medium plasticity, brown, trace of slag, roots and root fibres.	w≈PL			GRASS COVER
									CL-CI	Silty Sandy CLAY: low to medium plasticity, brown mottled orange and light grey, fine to medium grained sand.	w≈PL			SCREEN: 0-0.2m 13.01kg, NO FCF
	■		■						CL		w<PL			RESIDUAL
							1			Silty Sandy CLAY: low plasticity, brown mottled orange, fine to coarse grained sand.				RESIDUAL
										END OF BOREHOLE AT 0.8m				
							2							
							3							
							4							
							5							
							6							
							7							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **BH113** **1/1**

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 19/5/23 **Datum:** -

Plant Type: JK205 **Logged/Checked by:** H.W./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION	■		■		■	N = 13 3,5,8	0			FILL: Silty clay, low to medium plasticity, brown, trace of igneous and sandstone gravel, glass and ash.	w<PL			GRASS COVER SCREEN: 0-0.1m 10.30kg, NO FCF
	■		■			N = 30 8,9,11			CI-CH	Silty CLAY: medium to high plasticity, yellow brown and grey, trace of ironstone gravel and ironstone bands.	w≈PL			SCREEN: 0.1-0.5m 4.29kg, NO FCF RESIDUAL
							1							
	■		■			N = 16 7,7,9								
							2			END OF BOREHOLE AT 1.95m				
							3							
							4							
							5							
							6							
							7							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **BH114** **1/1**

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** PENDULUM / AUGER **R.L. Surface:** N/A

Date: 23/5/23 **Datum:** -

Plant Type: EXCAVATOR **Logged/Checked by:** O.B./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION	■		■		■		0			FILL: Silty clay, low to medium plasticity, brown, trace of ash and root fibres.	w≈PL			GRASS COVER SCREEN: 0-0.2m 10.02kg, NO FCF
									CI	Silty CLAY: medium plasticity, grey mottled orange and brown.	w≈PL			RESIDUAL
	■		■				1			END OF BOREHOLE AT 1.0m				
							2							
							3							
							4							
							5							
							6							
							7							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **BH115** **1/1**

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 19/5/23 **Datum:** -

Plant Type: JK205 **Logged/Checked by:** H.W./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION	■		■		■	N > 8 6,4,4/ 50mm REFUSAL	0		-	ASPHALTIC CONCRETE: 10mm.t FILL: Gravelly clay, low plasticity, brown, fine to medium grained, sub-angular igneous and ironstone gravel, trace of sand and ash.	w≈PL			SCREEN: 0.01-0.5m 9.80kg, NO FCF
										END OF BOREHOLE AT 0.5m				'TC' BIT REFUSAL ON INFERRED CONCRETE FOOTING
							1							
							2							
							3							
							4							
							5							
							6							
							7							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. BH116
1/2

SDUP101: 0.015-0.465m
SDUP102: 4.5-4.95m

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 17/5/23 **Datum:** -

Plant Type: JK205 **Logged/Checked by:** H.W./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
						N = 13 4,6,7	0		-	ASPHALTIC CONCRETE: 15mm.t FILL: Gravelly clay, low to medium plasticity, brown and light brown, fine to medium grained, sub-angular igneous and ironstone gravel, trace of sand.	w<PL			NO FCF OBSERVED IN SPOIL
						N = 16 6,10,6	1		CI-CH	Silty CLAY: medium to high plasticity, brown, trace of iron indurated bands, ironstone gravel and ash.	w≈PL			RESIDUAL
						N = 29 7,12,17	2							
						N = 22 5,10,12	3							
						N = 32 8,16,16	4		CL-CI	Silty Gravelly CLAY: low to medium plasticity, brown, fine to medium grained, sub-angular ironstone gravel.	w≈PL			RESIDUAL
							5		CI-CH	Silty CLAY: medium to high plasticity, yellow brown, trace of ash.	w<PL			RESIDUAL
						N = 26 7,12,14	6							
							7							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. BH116 2/2

SDUP101:0.015-0.465m
SDUP102: 4.5-4.95m

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 17/5/23 **Datum:** -

Plant Type: JK205 **Logged/Checked by:** H.W./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	■					N = 21 6,8,13				Silty CLAY: medium to high plasticity, yellow brown, trace of ash.	w<PL			
							8			END OF BOREHOLE AT 8.0m				GROUNDWATER MONITORING WELL INSTALLED TO 8m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 2m TO 8m. CASING 0m TO 2m. 2mm SAND FILTER PACK 1.5m TO 8m. BENTONITE SEAL 1m TO 1.5m. BACKFILLED WITH SAND TO THE SURFACE. COMPLETED WITH A CONCRETED GATIC COVER.
							9							
							10							
							11							
							12							
							13							
							14							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **BH117** **1/2**

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 17/5/23 **Datum:** -

Plant Type: JK205 **Logged/Checked by:** H.W./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	■		■			N = 19 5,9,10	0		-	ASPHALTIC CONCRETE: 10mm.t FILL: Gravelly clay, low to medium plasticity, fine to medium grained, sub-angular igneous gravel, trace of sand.	w<PL			NO FCF OBSERVED IN SPOIL
	■		■			N = 18 6,9,9			CI-CH	Silty CLAY: medium to high plasticity, grey and yellow brown, trace of iron indurated bands and ash.	w≈PL			RESIDUAL
	■		■			N = 22 7,10,12	1							
							2							
	■					N = 12 5,5,7	3			as above, but yellow brown and dark brown, trace of ironstone gravel.				
							4							
	■					N = 11 3,5,6					w>PL			
							5							
	■					N = 10 3,4,6	6							
▶							7							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **BH117** **2/2**

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 17/5/23 **Datum:** -

Plant Type: JK205 **Logged/Checked by:** H.W./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	■					N = 21 5,11,10				Silty CLAY: medium to high plasticity, yellow brown and dark brown, trace of ironstone gravel and ash.	w>PL			
							8			END OF BOREHOLE AT 8.0m				GROUNDWATER MONITORING WELL INSTALLED TO 8m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 2m TO 8m. CASING 0m TO 2m. 2mm SAND FILTER PACK 1.4m TO 8m. BENTONITE SEAL 0.5m TO 1.4m. BACKFILLED WITH SAND TO THE SURFACE. COMPLETED WITH A CONCRETED GATIC COVER.
							9							
							10							
							11							
							12							
							13							
							14							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **BH118** **1/1**

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** PENDULUM / AUGER **R.L. Surface:** N/A

Date: 23/5/23 **Datum:** -

Plant Type: EXCAVATOR **Logged/Checked by:** O.B./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION	■		■		■		0			FILL: Silty clay, medium plasticity, brown, trace of root fibres.	w≈PL			GRASS COVER
									CI-CH	Silty CLAY: medium to high plasticity, light brown mottled orange.	w≈PL			SCREEN: 0-0.2m 4.54kg, NO FCF
	■		■											RESIDUAL
										END OF BOREHOLE AT 0.8m				
							1							
							2							
							3							
							4							
							5							
							6							
							7							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **BH119** **1/1**

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** PENDULUM / AUGER **R.L. Surface:** N/A

Date: 23/5/23 **Datum:** -

Plant Type: EXCAVATOR **Logged/Checked by:** O.B./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION	■		■		■		0			FILL: Silty clay, low to medium plasticity, brown, trace of glass, roots and root fibres.	w≈PL			GRASS COVER SCREEN: 0-0.2m 6.45kg, NO FCF
									CL-CI	Silty CLAY: low to medium plasticity, light grey mottled orange and brown.	w<PL			RESIDUAL
	■		■				1							
										END OF BOREHOLE AT 1.1m				
							2							
							3							
							4							
							5							
							6							
							7							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **BH120** **1/1**

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 18/5/23 **Datum:** -

Plant Type: JK205 **Logged/Checked by:** H.W./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION	■		■		■	N = 20 3,6,14	0			FILL: Silty clay, low to medium plasticity, brown, trace of igneous and ironstone gravel, root fibres and ash.	w≈PL			GRASS COVER
	■		■			N > 20 10,20/ 100mm REFUSAL			CI-CH	Silty CLAY: medium to high plasticity, yellow brown and grey, trace of ironstone gravel.	w<PL			SCREEN: 0-0.1m 10.85kg, NO FCF SCREEN: 0.1-0.3m 2.90kg, NO FCF RESIDUAL
	■					N = 33 9,17,16	1			Silty Gravelly CLAY: medium to high plasticity, red brown, fine to medium grained, sub-angular ironstone gravel.	w≈PL			RESIDUAL
							2			END OF BOREHOLE AT 1.95m				
							3							
							4							
							5							
							6							
							7							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **BH121** **1/1**

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 18/5/23 **Datum:** -

Plant Type: JK205 **Logged/Checked by:** H.W./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION	■		■			N = 6 2,2,4	0		CI-CH	FILL: Silty clay, low to medium plasticity, brown, trace of root fibres.	w≈PL			GRASS COVER
	■		■			N = 28 7,12,16				Silty CLAY: medium to high plasticity, yellow brown and grey, trace of ironstone gravel.	w≈PL			NO FCF OBSERVED IN SPOIL RESIDUAL
							1			END OF BOREHOLE AT 0.95m				
							2							
							3							
							4							
							5							
							6							
							7							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. BH122 1/1

SDUP104: 0.03-0.4m

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 18/5/23 **Datum:** -

Plant Type: JK205 **Logged/Checked by:** H.W./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION	■		■			N = 22 14,14,8	0		-	ASPHALTIC CONCRETE: 30mm.t	D			NO FCF OBSERVED IN SPOIL
									CL-CI	FILL: Gravelly sand, fine to medium grained, orange brown, fine to medium grained, sub-angular igneous gravel.	w<PL			RESIDUAL
	■		■			N = 30 6,14,16	1			Silty CLAY: low to medium plasticity, yellow brown and grey, trace of ironstone gravel and ash.				
										END OF BOREHOLE AT 1.45m				
							2							
							3							
							4							
							5							
							6							
							7							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **SV1** **1/1**

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 18/5/23 **Datum:** -

Plant Type: JK205 **Logged/Checked by:** H.W./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION							0			FILL: Silty clay, low to medium plasticity, brown, trace of igneous gravel.	w>PL			GRASS COVER
	■		■							FILL: Silty sand, fine to medium grained, red brown, trace of igneous gravel, concrete and brick fragments.	M			
							1							
										END OF BOREHOLE AT 1.2m				'TC' BIT REFUSAL SOIL VAPOUR MONITORING WELL INSTALLED TO 1.2m. 2mm SAND FILTER PACK 0.7m TO 1.2m. BENTONITE SEAL 0.2m TO 0.7m. BACKFILLED WITH SAND TO THE SURFACE. COMPLETED WITH A CONCRETED GATIC COVER.
							2							
							3							
							4							
							5							
							6							
							7							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **SV2** **1/1**

Client: HI C/- APP

Project: PROPOSED HOSPITAL DEVELOPMENT

Location: 3 OSMAN STREET, BLAYNEY, NSW

Job No.: E35521PT **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 18/5/23 **Datum:** -

Plant Type: JK205 **Logged/Checked by:** H.W./T.H.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLE-TION							0			FILL: Silty clay, low to medium plasticity, brown, trace of igneous gravel and ash.	w>PL			GRASS COVER
							1			END OF BOREHOLE AT 1.2m				SOIL VAPOUR MONITORING WELL INSTALLED TO 1.2m. 2mm SAND FILTER PACK 0.7m TO 1.2m. BENTONITE SEAL 0.2m TO 0.7m. BACKFILLED WITH SAND TO THE SURFACE. COMPLETED WITH A CONCRETED GATIC COVER.
							2							
							3							
							4							
							5							
							6							
							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:

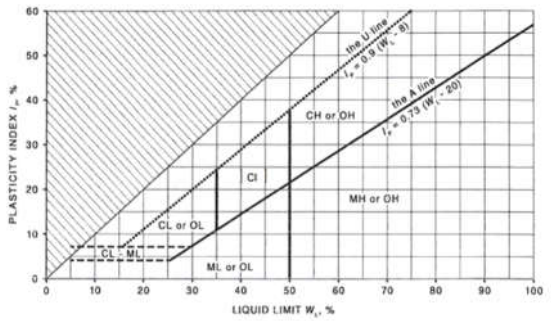
1 For a coarse grained soil with a fines content between 5% and 12%, the soil is given a dual classification comprising the two group symbols separated by a dash; for example, for a poorly graded gravel with between 5% and 12% silt fines, the classification is GP-GM.

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 PID = 100	Vane shear reading in kPa of undrained shear strength. Photoionisation detector reading in ppm (soil sample headspace test).
Moisture Condition (Fine Grained Soils)	w > PL $w \approx$ PL w < PL $w \approx$ LL w > LL	Moisture content estimated to be greater than plastic limit. Moisture content estimated to be approximately equal to plastic limit. Moisture content estimated to be less than plastic limit. Moisture content estimated to be near liquid limit. Moisture content estimated to be wet of liquid limit.
(Coarse Grained Soils)	D M W	DRY – runs freely through fingers. MOIST – does not run freely but no free water visible on soil surface. WET – free water visible on soil surface.
Strength (Consistency) Cohesive Soils	VS S F St VSt Hd Fr ( )	VERY SOFT – unconfined compressive strength ≤ 25kPa. SOFT – unconfined compressive strength > 25kPa and ≤ 50kPa. FIRM – unconfined compressive strength > 50kPa and ≤ 100kPa. STIFF – unconfined compressive strength > 100kPa and ≤ 200kPa. VERY STIFF – unconfined compressive strength > 200kPa and ≤ 400kPa. HARD – unconfined compressive strength > 400kPa. FRIABLE – strength not attainable, soil crumbles. Bracketed symbol indicates estimated consistency based on tactile examination or other assessment.
Density Index/ Relative Density (Cohesionless Soils)	VL L MD D VD ( )	**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 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.

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:

Site specific ABC values for specific metals have been adopted.

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.

JKEnvironments

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)	F: Clayey sand	<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)	F: Clayey sand	NA	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	<0.1	NA
SDUP3	BH15 0-0.1	F: Silty clay	<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	F: Silty clay	<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
BH101	0-0.1	F: Silty Clay	**7**	<0.4	**59**	**37**	**26**	**0.1**	**13**	**47**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH101 - [LAB_DUP]	0-0.1	F: Silty Clay	**4**	<0.4	**48**	**46**	**22**	<0.1	**15**	**41**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH101	0.5-0.7	Silty Clay	<4	<0.4	**11**	**11**	**7**	<0.1	**1**	**6**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH102	0-0.2	F: Silty Clay	<4	<0.4	**35**	**28**	**13**	<0.1	**11**	**38**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH102 - [LAB_DUP]	0-0.2	F: Silty Clay	<4	<0.4	**37**	**28**	**13**	<0.1	**11**	**37**	**1.8**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH102	0.65-0.9	Silty clay	<4	<0.4	**21**	**28**	**13**	<0.1	**5**	**22**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH103	0-0.2	F: Silty Clay	**4**	<0.4	**51**	**30**	**16**	<0.1	**14**	**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
BH104	0-0.2	F: Silty Clay	<4	<0.4	**33**	**40**	**11**	<0.1	**8**	**31**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH105	0-0.2	F: Silty Clay	<4	<0.4	**13**	**24**	**47**	<0.1	**6**	**74**	**0.59**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH105	0.4-0.7	Silty clay	<4	<0.4	**11**	**10**	**10**	<0.1	**3**	**22**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH106	0-0.2	F: Silty Clay	<4	<0.4	**39**	**17**	**13**	<0.1	**7**	**19**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH107	0.01-0.46	F: Silty Clayey Sand	<4	<0.4	**27**	**3**	**3**	<0.1	**14**	**5**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH107	1.5-1.95	Silty Clay	**5**	<0.4	**48**	**12**	**31**	**0.2**	**6**	**14**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH108	0-0.2	F: Silty Clay	**4**	<0.4	**14**	**17**	**23**	<0.1	**6**	**47**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH109	0-0.2	F: Silty Clay	**26**	<0.4	**17**	**52**	**37**	<0.1	**11**	**100**	**0.07**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	**0.2**	<0.1	<0.1	<0.1	Not Detected
BH109 - [LAB_DUP]	0-0.2	F: Silty Clay	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.1	<0.1	<0.1	<0.1	<0.1	**0.3**	<0.1	NA	NA	NA
BH109	0.8-1	Silty clay	**50**	<0.4	**13**	**16**	**20**	<0.1	**6**	**49**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH110	0-0.2	F: Silty Clay	<4	<0.4	**42**	**48**	**13**	<0.1	**7**	**49**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH110 - [LAB_DUP]	0-0.2	F: Silty Clay	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	NA	NA
BH111	0-0.2	F: Silty Clay	**10**	<0.4	**45**	**30**	**20**	<0.1	**20**	**46**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH112	0-0.2	F: Silty Clay	**79**	**0.5**	**66**	**36**	**64**	**0.4**	**52**	**98**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH112	0.4-0.6	Silty clay	**72**	<0.4	**53**	**27**	**56**	**0.5**	**50**	**83**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH113	0-0.1	F: Silty Clay	**120**	<0.4	**43**	**21**	**55**	**0.1**	**11**	**51**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH113	0.1-0.45	F: Silty Clay	<4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH113	0.6-0.95	Silty clay	<4	<0.4	**27**	**8**	**13**	<0.1	**4**	**10**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH114	0-0.2	F: Silty Clay	**4**	<0.4	**19**	**8**	**9**	<0.1	**7**	**12**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH114 - [LAB_DUP]	0-0.2	F: Silty Clay	**4**	<0.4	**20**	**8**	**10**	<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
BH115	0.01-0.2	F: Gravelly Clay	<4	<0.4	**34**	**5**	**5**	<0.1	**20**	**10**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH116	0.015-0.45	F: Gravelly Clay	**4**	<0.4	**120**	**59**	**3**	<0.1	**54**	**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
BH116 (Cr VI)	0.015-0.45	F: Gravelly Clay	NA	NA	**120**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH116	1.5-1.95	Silty Clay	**5**	<0.4	**46**	**12**	**19**	<0.1	**5**	**15**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH116	4.5-4.95	Silty Gravelly Clay	**25**	<0.4	**85**	**98**	**37**	<0.1	**21**	**43**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH117	0.01-0.4	F: Gravelly Clay	**10**	<0.4	**280**	**110**	**5**	<0.1	**130**	**38**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH117 (Cr VI)	0.01-0.4	F: Gravelly Clay	NA	NA	**2**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH117	0.7-0.95	F: Gravelly Clay	<4	<0.4	**31**	**12**	**22**	<0.1	**6**	**13**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH117 - [LAB_DUP]	0.7-0.95	F: Gravelly Clay	<4	<0.4	**37**	**12**	**21**	<0.1	**6**	**13**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH117	1.6-1.95	Silty Clay	<4	<0.4	**18**	**11**	**8**	<0.1	**4**	**20**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH117	3.0-3.4	Silty Clay	**16**	<0.4	**54**	**170**	**17**	<0.1	**17**	**65**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH117 - [LAB_DUP]	3.0-3.4	Silty Clay	**11**	<0.4	**23**	**180**	**26**	<0.1	**16**	**61**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH117 - [TRIPLICATE]	3.0-3.4	Silty Clay	**11**	<0.4	**13**	**200**	**14**	<0.1	**17**	**71**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH118	0-0.2	F: Silty Clay	<4	<0.4	**15**	**16**	**16**	<0.1	**5**	**21**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH118	0.6-0.8	Silty clay	<4	<0.4	**21**	**12**	**11**	<0.1	**6**	**17**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH119	0-0.2	F: Silty Clay	<4	<0.4	**33**	**26**	**21**	<0.1	**8**	**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
BH119	0.9-1.1	Silty clay	<4	<0.4	**38**	**11**	**14**	<0.1	**5**	**10**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH120	0-0.1	F: Silty Clay	**6**	<0.4	**61**	**13**	**18**	<0.1	**6**	**13**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH120 - [LAB_DUP]	0-0.1	F: Silty Clay	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	NA	NA
BH120	0.5-0.75	Silty Clay	**5**	<0.4	**38**	**15**	**40**	<0.1	**6**	**13**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH121	0-0.1	F: Silty Clay	**85**	<0.4	**31**	**22**	**53**	<0.1	**14**	**64**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH122	0.03-0.4	F: Gravelly Sand	<4	<0.4	**7**	**40**	**2**	<0.1	**2**	**4**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH122	1.0-1.45	Silty Clay	<4	<0.4	**26**	**9**	**16**	<0.1	**4**	**11**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SV1	0.5-0.8	F: Silty Sand	**9**	<0.4	**39**	**15**	**9**	<0.1	**12**	**17**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
SDUP1	BH103 (0-0.2)	F: Silty Clay	**5**	<0.4	**38**	**35**	**13**	<0.1	**10**	**34**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
SDUP2	BH102 (0-0.2)	F: Silty Clay	<4	<0.4	**39**	**27**	**14**	<0.1	**12**	**52**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
SDUP101	BH116 (0.015-0.45)	F: Gravelly Clay	**10**	<0.4	**250**	**93**	**6**	<0.1	**110**	**34**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
SDUP101 (Cr VI)	BH116 (0.015-0.45)	F: Gravelly Clay	NA	NA	**1**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SDUP102	BH116 (4.5-4.95)	Silty Gravelly Clay	**17**	<0.4	**51**	**66**	**19**	<0.1	**15**	**34**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
SDUP103	BH101 (0-0.1)	F: silty clay	**4**	<0.4	**44**	**38**	**16**	<0.1	**13**	**40**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
SDUP104	BH122 (0.03-0.4)	F: Gravelly Sand	<4	<0.4	**7**	**62**	**2**	<0.1	**1**	**6**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
SDUP104 - LAB DUP	BH122 (0.03-0.4)	F: Gravelly Sand	NA	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Number of Samples (DSI samples only)			52	51	54	51	51	51	51	51	51	51	39	39	39	39	39	39	39	36	36	24
Maximum Value (DSI samples only)			120	0.5	280	200	64	0.5	130	100	1.8	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.3	<PQL	<PQL	<PQL	Not Detected
Statistical Analysis on Fill Samples (PSI and DSI data)																						
Number of Fill Samples			**37**	NC	**36**	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Mean Value			**14**	NC	**50**	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Standard Deviation			**25.0**	NC	**69.4**	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
% UCL			**95**	NC	**95**	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
UCL Value			**32.09**	NC	**68.39**	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

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

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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)	F: Clayey sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	NA
SDUP2 [LAB_DUP]	BH20 (0.05-0.2)	F: Clayey sand	0m to <1m	Sand	NA	<50	NA	NA	NA	NA	NA	NA
SDUP3	BH15 0-0.1	F: Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	NA
SDUP3 - [LAB_DUP]	BH15 0-0.1	F: Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	NA
BH101	0-0.1	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.2
BH101 - [LAB_DUP]	0-0.1	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.2
BH101	0.5-0.7	Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.1
BH102	0-0.2	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH102 - [LAB_DUP]	0-0.2	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH102	0.65-0.9	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH103	0-0.2	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH104	0-0.2	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH105	0-0.2	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH105	0.4-0.7	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH106	0-0.2	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH107	0.01-0.46	F: Silty Clayey Sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH107	1.5-1.95	Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH108	0-0.2	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH109	0-0.2	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH109	0.8-1	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH110	0-0.2	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH111	0-0.2	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH112	0-0.2	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	2.5
BH112	0.4-0.6	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.1
BH113	0-0.1	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH113	0.6-0.95	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH114	0-0.2	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH114 - [LAB_DUP]	0-0.2	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH115	0.01-0.2	F: Gravelly Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH116	0.015-0.45	F: Gravelly Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.1
BH116 - [LAB_DUP]	0.015-0.45	F: Gravelly Clay	0m to <1m	Sand	NA	<50	NA	NA	NA	NA	NA	0.1
BH116	1.5-1.95	Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.4
BH116	4.5-4.95	Silty Gravelly Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH117	0.01-0.4	F: Gravelly Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH117	0.7-0.95	F: Gravelly Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH117 - [LAB_DUP]	0.7-0.95	F: Gravelly Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH117	1.6-1.95	Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH117	3.0-3.4	Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH117 - [LAB_DUP]	3.0-3.4	Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH118	0-0.2	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.3
BH119	0-0.2	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	2.6
BH119	0.9-1.1	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0.9
BH120	0-0.1	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH120	0.5-0.75	Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH121	0-0.1	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH122	0.03-0.4	F: Gravelly Sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH122	1.0-1.45	Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
SV1	0.5-0.8	F: Silty Sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
SDUP1	BH103 (0-0.2)	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	-
SDUP2	BH102 (0-0.2)	F: Silty Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	-
SDUP101	BH116 (0.015-0.45)	F: Gravelly Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	-
SDUP102	BH116 (4.5-4.95)	Silty Gravelly Clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	-
SDUP103	BH101 (0-0.1)	F: silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	-
SDUP104	BH122 (0.03-0.4)	F: Gravelly Sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	-
SDUP104 - LAB DUP	BH122 (0.03-0.4)	F: Gravelly Sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	-
Total Number of Samples (DSI samples only)					51	52	51	51	51	51	51	45
Maximum Value (DSI samples only)					<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	2.6

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)	F: Clayey sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
SDUP2 [LAB_DUP]	BH20 (0.05-0.2)	F: Clayey sand	0m to <1m	Sand	NA	110	NA	NA	NA	NA	NA
SDUP3	BH15 0-0.1	F: Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
SDUP3 - [LAB_DUP]	BH15 0-0.1	F: Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH101	0-0.1	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH101 - [LAB_DUP]	0-0.1	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH101	0.5-0.7	Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH102	0-0.2	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH102 - [LAB_DUP]	0-0.2	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH102	0.65-0.9	Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH103	0-0.2	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH104	0-0.2	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH105	0-0.2	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH105	0.4-0.7	Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH106	0-0.2	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH107	0.01-0.46	F: Silty Clayey Sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH107	1.5-1.95	Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH108	0-0.2	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH109	0-0.2	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH109	0.8-1	Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH110	0-0.2	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH111	0-0.2	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH112	0-0.2	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH112	0.4-0.6	Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH113	0-0.1	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH113	0.6-0.95	Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH114	0-0.2	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH114 - [LAB_DUP]	0-0.2	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH115	0.01-0.2	F: Gravelly Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH116	0.015-0.45	F: Gravelly Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH116 - [LAB_DUP]	0.015-0.45	F: Gravelly Clay	0m to <1m	Sand	NA	110	NA	NA	NA	NA	NA
BH116	1.5-1.95	Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH116	4.5-4.95	Silty Gravelly Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH117	0.01-0.4	F: Gravelly Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH117	0.7-0.95	F: Gravelly Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH117 - [LAB_DUP]	0.7-0.95	F: Gravelly Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH117	1.6-1.95	Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH117	3.0-3.4	Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH117 - [LAB_DUP]	3.0-3.4	Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH118	0-0.2	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH118	0.6-0.8	Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH119	0-0.2	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH119	0.9-1.1	Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH120	0-0.1	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH120	0.5-0.75	Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH121	0-0.1	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH122	0.03-0.4	F: Gravelly Sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH122	1.0-1.45	Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
SV1	0.5-0.8	F: Silty Sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
SDUP1	BH103 (0-0.2)	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
SDUP2	BH102 (0-0.2)	F: Silty Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
SDUP101	BH116 (0.015-0.45)	F: Gravelly Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
SDUP102	BH116 (4.5-4.95)	Silty Gravelly Clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
SDUP103	BH101 (0-0.1)	F: silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
SDUP104	BH122 (0.03-0.4)	F: Gravelly Sand	0m to <1m	Sand	45	110	0.5	160	55	40	3
SDUP104 - LAB DUP	BH122 (0.03-0.4)	F: Gravelly Sand	0m to <1m	Sand	45	110	0.5	160	55	40	3

JKEnvironments

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	BH20 (0.05-0.2)	Coarse	<25	<50	**250**	**440**
SDUP2 [LAB_DUP]	BH20 (0.05-0.2)	Coarse	NA	<50	**230**	**440**
SDUP3	BH15 0-0.1	Fine	<25	<50	<100	<100
SDUP3 - [LAB_DUP]	BH15 0-0.1	Fine	<25	<50	<100	<100
BH101	0-0.1	Fine	<25	<50	<100	<100
BH101 - [LAB_DUP]	0-0.1	Fine	<25	<50	<100	<100
BH101	0.5-0.7	Fine	<25	<50	<100	<100
BH102	0-0.2	Fine	<25	<50	<100	<100
BH102 - [LAB_DUP]	0-0.2	Fine	<25	<50	<100	<100
BH102	0.65-0.9	Fine	<25	<50	<100	<100
BH103	0-0.2	Fine	<25	<50	<100	<100
BH104	0-0.2	Fine	<25	<50	<100	<100
BH105	0-0.2	Fine	<25	<50	<100	<100
BH105	0.4-0.7	Fine	<25	<50	<100	<100
BH106	0-0.2	Fine	<25	<50	<100	<100
BH107	0.01-0.46	Coarse	<25	<50	<100	<100
BH107	1.5-1.95	Fine	<25	<50	<100	<100
BH108	0-0.2	Fine	<25	<50	<100	<100
BH109	0-0.2	Fine	<25	<50	<100	<100
BH109	0.8-1	Fine	<25	<50	<100	<100
BH110	0-0.2	Fine	<25	<50	<100	<100
BH111	0-0.2	Fine	<25	<50	<100	<100
BH112	0-0.2	Fine	<25	<50	<100	<100
BH112	0.4-0.6	Fine	<25	<50	<100	<100
BH113	0-0.1	Fine	<25	<50	<100	<100
BH113	0.6-0.95	Fine	<25	<50	<100	<100
BH114	0-0.2	Fine	<25	<50	<100	<100
BH114 - [LAB_DUP]	0-0.2	Fine	<25	<50	<100	<100
BH115	0.01-0.2	Fine	<25	<50	<100	<100
BH116	0.015-0.45	Fine	<25	<50	<100	<100
BH116 - [LAB_DUP]	0.015-0.45	Fine	NA	<50	<100	<100
BH116	1.5-1.95	Fine	<25	<50	<100	<100
BH116	4.5-4.95	Fine	<25	<50	<100	<100
BH117	0.01-0.4	Fine	<25	<50	<100	<100
BH117	0.7-0.95	Fine	<25	<50	<100	<100
BH117 - [LAB_DUP]	0.7-0.95	Fine	<25	<50	<100	<100
BH117	1.6-1.95	Fine	<25	<50	<100	<100
BH117	3.0-3.4	Fine	<25	<50	<100	<100
BH117 - [LAB_DUP]	3.0-3.4	Fine	<25	<50	<100	<100
BH118	0-0.2	Fine	<25	<50	<100	<100
BH118	0.6-0.8	Fine	<25	<50	<100	<100
BH119	0-0.2	Fine	<25	<50	<100	<100
BH119	0.9-1.1	Fine	<25	<50	<100	<100
BH120	0-0.1	Fine	<25	<50	<100	<100
BH120	0.5-0.75	Fine	<25	<50	<100	<100
BH121	0-0.1	Fine	<25	<50	<100	<100
BH122	0.03-0.4	Coarse	<25	<50	<100	<100
BH122	1.0-1.45	Fine	<25	<50	<100	<100
SV1	0.5-0.8	Coarse	<25	<50	<100	<100
SDUP1	BH103 (0-0.2)	Fine	<25	<50	<100	<100
SDUP2	BH102 (0-0.2)	Fine	<25	<50	**340**	**120**
SDUP101	BH116 (0.015-0.45)	Fine	<25	<50	<100	<100
SDUP102	BH116 (4.5-4.95)	Fine	<25	<50	<100	<100
SDUP103	BH101 (0-0.1)	Fine	<25	<50	<100	<100
SDUP104	BH122 (0.03-0.4)	Fine	<25	<50	<100	<100
SDUP104 - LAB DUP	BH122 (0.03-0.4)	Fine	<25	<50	<100	<100
Total Number of Samples (DSI samples only)			51	52	52	52
Maximum Value (DSI samples only)			<PQL	<PQL	340	120

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	BH20 (0.05-0.2)	Coarse	700	1000	2500	10000
SDUP2 [LAB_DUP]	BH20 (0.05-0.2)	Coarse	NA	1000	2500	10000
SDUP3	BH15 0-0.1	Fine	800	1000	3500	10000
SDUP3 - [LAB_DUP]	BH15 0-0.1	Fine	800	1000	3500	10000
BH101	0-0.1	Fine	800	1000	3500	10000
BH101 - [LAB_DUP]	0-0.1	Fine	800	1000	3500	10000
BH101	0.5-0.7	Fine	800	1000	3500	10000
BH102	0-0.2	Fine	800	1000	3500	10000
BH102 - [LAB_DUP]	0-0.2	Fine	800	1000	3500	10000
BH102	0.65-0.9	Fine	800	1000	3500	10000
BH103	0-0.2	Fine	800	1000	3500	10000
BH104	0-0.2	Fine	800	1000	3500	10000
BH105	0-0.2	Fine	800	1000	3500	10000
BH105	0.4-0.7	Fine	800	1000	3500	10000
BH106	0-0.2	Fine	800	1000	3500	10000
BH107	0.01-0.46	Coarse	700	1000	2500	10000
BH107	1.5-1.95	Fine	800	1000	3500	10000
BH108	0-0.2	Fine	800	1000	3500	10000
BH109	0-0.2	Fine	800	1000	3500	10000
BH109	0.8-1	Fine	800	1000	3500	10000
BH110	0-0.2	Fine	800	1000	3500	10000
BH111	0-0.2	Fine	800	1000	3500	10000
BH112	0-0.2	Fine	800	1000	3500	10000
BH112	0.4-0.6	Fine	800	1000	3500	10000
BH113	0-0.1	Fine	800	1000	3500	10000
BH113	0.6-0.95	Fine	800	1000	3500	10000
BH114	0-0.2	Fine	800	1000	3500	10000
BH114 - [LAB_DUP]	0-0.2	Fine	800	1000	3500	10000
BH115	0.01-0.2	Fine	800	1000	3500	10000
BH116	0.015-0.45	Fine	800	1000	3500	10000
BH116 - [LAB_DUP]	0.015-0.45	Fine	NA	1000	3500	10000
BH116	1.5-1.95	Fine	800	1000	3500	10000
BH116	4.5-4.95	Fine	800	1000	3500	10000
BH117	0.01-0.4	Fine	800	1000	3500	10000
BH117	0.7-0.95	Fine	800	1000	3500	10000
BH117 - [LAB_DUP]	0.7-0.95	Fine	800	1000	3500	10000
BH117	1.6-1.95	Fine	800	1000	3500	10000
BH117	3.0-3.4	Fine	800	1000	3500	10000
BH117 - [LAB_DUP]	3.0-3.4	Fine	800	1000	3500	10000
BH118	0-0.2	Fine	800	1000	3500	10000
BH118	0.6-0.8	Fine	800	1000	3500	10000
BH119	0-0.2	Fine	800	1000	3500	10000
BH119	0.9-1.1	Fine	800	1000	3500	10000
BH120	0-0.1	Fine	800	1000	3500	10000
BH120	0.5-0.75	Fine	800	1000	3500	10000
BH121	0-0.1	Fine	800	1000	3500	10000
BH122	0.03-0.4	Coarse	700	1000	2500	10000
BH122	1.0-1.45	Fine	800	1000	3500	10000
SV1	0.5-0.8	Coarse	700	1000	2500	10000
SDUP1	BH103 (0-0.2)	Fine	800	1000	3500	10000
SDUP2	BH102 (0-0.2)	Fine	800	1000	3500	10000
SDUP101	BH116 (0.015-0.45)	Fine	800	1000	3500	10000
SDUP102	BH116 (4.5-4.95)	Fine	800	1000	3500	10000
SDUP103	BH101 (0-0.1)	Fine	800	1000	3500	10000
SDUP104	BH122 (0.03-0.4)	Fine	800	1000	3500	10000
SDUP104 - LAB DUP	BH122 (0.03-0.4)	Fine	800	1000	3500	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	BH20 (0.05-0.2)	<25	<50	**250**	**440**	<0.2	<0.5	<1	<1	<1	NA
SDUP2 [LAB_DUP]	BH20 (0.05-0.2)	NA	<50	**230**	**440**	NA	NA	NA	NA	NA	NA
SDUP3	BH15 0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	NA
SDUP3 - [LAB_DUP]	BH15 0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	NA
BH101	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.2**
BH101 - [LAB_DUP]	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.2**
BH101	0.5-0.7	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.1**
BH102	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH102 - [LAB_DUP]	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH102	0.65-0.9	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH103	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH104	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH105	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH105	0.4-0.7	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH106	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH107	0.01-0.46	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH107	1.5-1.95	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH108	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH109	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH109	0.8-1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH110	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH111	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH112	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**2.5**
BH112	0.4-0.6	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.1**
BH113	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH113	0.6-0.95	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH114	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH114 - [LAB_DUP]	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH115	0.01-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH116	0.015-0.45	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.1**
BH116 - [LAB_DUP]	0.015-0.45	NA	<50	<100	<100	NA	NA	NA	NA	NA	**0.1**
BH116 (Cr VI)	1.5-1.95	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.4**
BH116	4.5-4.95	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH117	0.01-0.4	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH117	0.7-0.95	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH117 - [LAB_DUP]	0.7-0.95	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH117	1.6-1.95	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH117	3.0-3.4	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH117 - [LAB_DUP]	3.0-3.4	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH118	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**1.1**
BH118	0.6-0.8	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.3**
BH119	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**2.6**
BH119	0.9-1.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.9**
BH120	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH120	0.5-0.75	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH121	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH122	0.03-0.4	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH122	1.0-1.45	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
SV1	0.5-0.8	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
SDUP1	BH103 (0-0.2)	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	-
SDUP2	BH102 (0-0.2)	<25	<50	**340**	**120**	<0.2	<0.5	<1	<1	<1	-
SDUP101	BH116 (0.015-0.45)	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	-
SDUP102	BH116 (4.5-4.95)	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	-
SDUP103	BH101 (0-0.1)	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	-
SDUP104	BH122 (0.03-0.4)	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	-
SDUP104 - LAB DUP	BH122 (0.03-0.4)	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	-
Total Number of Samples (DSI samples only)		51	52	52	52	51	51	51	51	51	45
Maximum Value (DSI samples only)		<PQL	<PQL	340	120	<PQL	<PQL	<PQL	<PQL	<PQL	2.6

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

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
18/05/2023	BH101	0-0.1	No	10	10,700	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	323727	BH101	0-0.1	715.64	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
18/05/2023	BH101	0.1-0.4	NA	2	2,100	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
22/05/2023	BH102	0-0.2	No	10	10,420	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	324186	BH102	0-0.2	511.98	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
22/05/2023	BH103	0-0.2	No	10	10,120	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	324186	BH103	0-0.2	455.81	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
22/05/2023	BH104	0-0.2	No	10	10,610	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	324186	BH104	0-0.2	466.76	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
22/05/2023	BH104	0.4-0.6	NA	5	540	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	324186	BH105	0-0.2	442.96	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
22/05/2023	BH105	0-0.2	No	10	10,980	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
23/05/2023	BH106	0-0.2	No	5	5,010	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	324186	BH106	0-0.2	373.51	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
19/05/2023	BH107	0.01-1.0	No	10	7,520	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	323727	BH107	0.01-0.46	875.9	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
19/05/2023	BH107	1.0-1.4	NA	10	12,390	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
23/05/2023	BH108	0-0.2	No	10	7,910	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	324186	BH108	0-0.2	537.93	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
22/05/2023	BH109	0-0.2	No	10	12,010	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	324186	BH109	0-0.2	547.95	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
22/05/2023	BH110	0-0.2	No	10	11,430	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	324186	BH110	0-0.2	630.28	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
22/05/2023	BH111	0-0.2	No	10	10,670	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	324186	BH111	0-0.2	477.82	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
23/05/2023	BH112	0-0.2	No	10	13,010	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	324186	BH112	0-0.2	600.88	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
19/05/2023	BH113	0-0.1	No	10	10,030	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	323727	BH113	0-0.1	775.21	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
19/05/2023	BH113	0.1-0.5	NA	4	4,290	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
23/05/2023	BH114	0-0.2	No	10	10,020	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	324186	BH114	0-0.2	631.76	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
19/05/2023	BH115	0.01-0.5	No	10	9,800	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	323727	BH115	0.01-0.2	869.8	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
19/05/2023	BH116	0.015-0.45	No	--	--	--	--	--	--	--	--	--	--	--	323727	BH116	0.015-0.45	692.67	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
17/05/2023	BH117	0.01-0.4	No	--	--	--	--	--	--	--	--	--	--	--	323727	BH117	0.01-0.4	848.21	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
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	323727	BH117	0.7-0.95	279.06	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
23/05/2023	BH118	0-0.2	No	5	4,540	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	324186	BH118	0-0.2	413.6	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
23/05/2023	BH119	0-0.2	No	6	6,450	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	324186	BH119	0-0.2	461.19	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
18/05/2023	BH120	0-0.1	No	10	10,850	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	323727	BH120	0-0.1	758.56	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
18/05/2023	BH120	0.1-0.3	NA	3	2,900	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	323727	BH121	0-0.1	718.77	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
18/05/2023	BH121	0-0.1	No	--	--	--	--	--	--	--	--	--	--	--	323727	BH122	0.03-0.4	1037.63	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
18/05/2023	BH122	0.03-04	No	--	--	--	--	--	--	--	--	--	--	--	323727	SV1	0.5-0.8	817.76	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)	F: Clayey sand	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)	F: Clayey sand	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	F: Silty clay	Fine	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	F: Silty clay	Fine	NA	NA	NA	<4	25	17	14	6	27	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH101	0-0.1	F: Silty Clay	Fine	NA	NA	NA	7	59	37	26	13	47	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH101 - [LAB_DUP]	0-0.1	F: Silty Clay	Fine	NA	NA	NA	4	48	46	22	15	41	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH101	0.5-0.7	Silty Clay	Fine	NA	NA	NA	<4	11	11	7	1	6	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH102	0-0.2	F: Silty Clay	Fine	NA	NA	NA	<4	35	28	13	11	38	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH102 - [LAB_DUP]	0-0.2	F: Silty Clay	Fine	NA	NA	NA	<4	37	28	13	11	37	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	0.2
BH102	0.65-0.9	Silty clay	Fine	NA	NA	NA	<4	21	28	13	5	22	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH103	0-0.2	F: Silty Clay	Fine	NA	NA	NA	4	51	30	16	14	32	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH104	0-0.2	F: Silty Clay	Fine	NA	NA	NA	<4	33	40	11	8	31	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH105	0-0.2	F: Silty Clay	Fine	NA	NA	NA	<4	13	24	47	6	74	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	0.1
BH105	0.4-0.7	Silty clay	Fine	NA	NA	NA	<4	11	10	10	3	22	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH106	0-0.2	F: Silty Clay	Fine	NA	NA	NA	<4	39	17	13	7	19	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH107	0.01-0.46	F: Silty Clayey Sand	Coarse	NA	NA	NA	<4	27	3	3	14	5	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH107	1.5-1.95	Silty Clay	Fine	NA	NA	NA	5	48	12	31	6	14	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH108	0-0.2	F: Silty Clay	Fine	NA	NA	NA	4	14	17	23	6	47	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH109	0-0.2	F: Silty Clay	Fine	NA	NA	NA	26	17	52	37	11	100	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	0.07
BH109 - [LAB_DUP]	0-0.2	F: Silty Clay	Fine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH109	0.8-1	Silty clay	Fine	NA	NA	NA	50	13	16	20	6	49	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH110	0-0.2	F: Silty Clay	Fine	NA	NA	NA	<4	42	48	13	7	49	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH110 - [LAB_DUP]	0-0.2	F: Silty Clay	Fine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH111	0-0.2	F: Silty Clay	Fine	NA	NA	NA	10	45	30	20	20	46	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH112	0-0.2	F: Silty Clay	Fine	NA	8.5	NA	79	66	36	64	52	98	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH112	0.4-0.6	Silty clay	Fine	NA	11	NA	72	53	27	56	50	83	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH113	0-0.1	F: Silty Clay	Fine	NA	NA	NA	120	43	21	55	11	51	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH113	0.1-0.45	F: Silty Clay	Fine	NA	NA	NA	<4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH113	0.6-0.95	Silty clay	Fine	NA	NA	NA	<4	27	8	13	4	10	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH114	0-0.2	F: Silty Clay	Fine	NA	NA	NA	4	19	8	9	7	12	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH114 - [LAB_DUP]	0-0.2	F: Silty Clay	Fine	NA	NA	NA	4	20	8	10	6	12	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH115	0.01-0.2	F: Gravelly Clay	Fine	NA	NA	NA	<4	34	5	5	20	10	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH116	0.015-0.45	F: Gravelly Clay	Fine	NA	28	NA	4	120	59	3	54	23	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH116 - [LAB_DUP]	0.015-0.45	F: Gravelly Clay	Fine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<50	<100	<100	NA	NA	NA	NA	NA
BH116 (Cr VI)	0.015-0.45	F: Gravelly Clay	Fine	NA	NA	NA	NA	120	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH116	1.5-1.95	Silty Clay	Fine	NA	NA	NA	5	46	12	19	5	15	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH116	4.5-4.95	Silty Gravelly Clay	Fine	6.6	4.3	NA	25	85	98	37	21	43	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH117	0.01-0.4	F: Gravelly Clay	Fine	8	22	6	10	280	110	5	130	38	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH117 (Cr VI)	0.01-0.4	F: Gravelly Clay	Fine	NA	NA	NA	NA	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH117	0.7-0.95	F: Gravelly Clay	Fine	NA	NA	NA	<4	31	12	22	6	13	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH117 - [LAB_DUP]	0.7-0.95	F: Gravelly Clay	Fine	NA	NA	NA	<4	37	12	21	6	13	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH117	1.6-1.95	Silty Clay	Fine	NA	NA	NA	<4	18	11	8	4	20	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH117	3.0-3.4	Silty Clay	Fine	5.9	11	NA	16	54	170	17	17	65	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH117 - [LAB_DUP]	3.0-3.4	Silty Clay	Fine	5.9	11	NA	11	23	180	26	16	61	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH117 - [TRIPLICATE]	3.0-3.4	Silty Clay	Fine	5.9	11	NA	11	13	200	14	17	71	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH118	0-0.2	F: Silty Clay	Fine	NA	NA	NA	<4	15	16	16	5	21	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH118	0.6-0.8	Silty clay	Fine	NA	NA	NA	<4	21	12	11	6	17	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH119	0-0.2	F: Silty Clay	Fine	NA	NA	NA	<4	33	26	21	8	23	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH119	0.9-1.1	Silty clay	Fine	NA	NA	NA	<4	38	11	14	5	10	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH120	0-0.1	F: Silty Clay	Fine	NA	NA	NA	6	61	13	18	6	13	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH120 - [LAB_DUP]	0-0.1	F: Silty Clay	Fine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH120	0.5-0.75	Silty Clay	Fine	NA	NA	NA	5	38	15	40	6	13	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH121	0-0.1	F: Silty Clay	Fine	NA	NA	NA	85	31	22	53	14	64	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH122	0.03-0.4	F: Gravelly Sand	Coarse	NA	NA	NA	<4	7	40	2	2	4	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH122	1.0-1.45	Silty Clay	Fine	NA	NA	NA	<4	26	9	16	4	11	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
SV1	0.5-0.8	F: Silty Sand	Coarse	NA	NA	NA	9	39	15	9	12	17	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
SDUP1	BH103 (0-0.2)	F: Silty Clay	Fine	NA	NA	NA	5	38	35	13	10	34	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
SDUP2	BH102 (0-0.2)	F: Silty Clay	Fine	NA	NA	NA	<4	39	27	14	12	52	<1	<0.1	<25	<50	340	120	<0.2	<0.5	<1	<1	<0.05
SDUP101	BH116 (0.015-0.45)	F: Gravelly Clay	Fine	7.5	16	17	10	250	93	6	110	34	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
SDUP101 (Cr VI)	BH116 (0.015-0.45)	F: Gravelly Clay	Fine	NA	NA	NA	NA	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SDUP102	BH116 (4.5-4.95)	Silty Gravelly Clay	Fine	NA	NA	NA	17	51	66	19	15	34	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
SDUP103	BH101 (0-0.1)	F: silty clay	Fine	NA	NA	NA	4	44	38	16	13	40	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
SDUP104	BH122 (0.03-0.4)	F: Gravelly Sand	Fine	NA	NA	NA	<4	7	62	2	1	6	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
SDUP104 - LAB DUP	BH122 (0.03-0.4)	F: Gravelly Sand	Fine	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
Total Number of Samples (DSI samples only)				7	12	4	70	72	69	69	69	69	69	53	69	71	71	71	69	69	69	69	70
Maximum Value (DSI samples only)				8	32	17	120	360	200	260	310	200	<PQL	<PQL	<PQL	<PQL	340	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)	F: Clayey sand	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)	F: Clayey sand	Coarse	NA	NA	NA	--	--	--	--	--	--	--	--	--	120	300	2800	--	--	--	--	20
SDUP3	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
SDUP3 - [LAB_DUP]	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
BH101	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
BH101 - [LAB_DUP]	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
BH101	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
BH102	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
BH102 - [LAB_DUP]	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
BH102	0.65-0.9	Silty clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	--	180	120	1300	5600	65	105	125	45	20
BH103	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
BH104	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
BH105	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
BH105	0.4-0.7	Silty clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	--	180	120	1300	5600	65	105	125	45	20
BH106	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
BH107	0.01-0.46	F: Silty Clayey Sand	Coarse	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	300	2800	50	85	70	105	20
BH107	1.5-1.95	Silty Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	--	180	120	1300	5600	65	105	125	45	20
BH108	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
BH109	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
BH109 - [LAB_DUP]	0-0.2	F: Silty Clay	Fine	NA	NA	NA	--	--	--	--	--	--	--	180	--	--	--	--	--	--	--	--	--
BH109	0.8-1	Silty clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
BH110	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
BH110 - [LAB_DUP]	0-0.2	F: Silty Clay	Fine	NA	NA	NA	--	--	--	--	--	--	--	180	--	--	--	--	--	--	--	--	--
BH111	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
BH112	0-0.2	F: Silty Clay	Fine	NA	8.5	NA	100	200	90	1300	180	190	170	180	180	120	1300	5600	65	105	125	45	20
BH112	0.4-0.6	Silty clay	Fine	NA	11	NA	100	200	90	1300	280	190	170	--	180	120	1300	5600	65	105	125	45	20
BH113	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
BH113	0.1-0.45	F: Silty Clay	Fine	NA	NA	NA	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BH113	0.6-0.95	Silty clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	--	180	120	1300	5600	65	105	125	45	20
BH114	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
BH114 - [LAB_DUP]	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
BH115	0.01-0.2	F: Gravelly Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
BH116	0.015-0.45	F: Gravelly Clay	Fine	NA	28	NA	100	200	90	1300	360	190	170	180	180	120	1300	5600	65	105	125	45	20
BH116 - [LAB_DUP]	0.015-0.45	F: Gravelly Clay	Fine	NA	NA	NA	--	--	--	--	--	--	--	--	--	120	1300	5600	--	--	--	--	--
BH116 (Cr VI)	0.015-0.45	F: Gravelly Clay	Fine	NA	NA	NA	--	200	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BH116	1.5-1.95	Silty Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	--	180	120	1300	5600	65	105	125	45	20
BH116	4.5-4.95	Silty Gravelly Clay	Fine	6.6	4.3	NA	100	200	120	1300	35	350	170	180	180	120	1300	5600	65	105	125	45	20
BH117	0.01-0.4	F: Gravelly Clay	Fine	8	22	6	100	410	250	1300	360	1100	170	180	180	120	1300	5600	65	105	125	45	20
BH117 (Cr VI)	0.01-0.4	F: Gravelly Clay	Fine	NA	NA	NA	--	200	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BH117	0.7-0.95	F: Gravelly Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
BH117 - [LAB_DUP]	0.7-0.95	F: Gravelly Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
BH117	1.6-1.95	Silty Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	--	180	120	1300	5600	65	105	125	45	20
BH117	3.0-3.4	Silty Clay	Fine	5.9	11	NA	100	200	220	1300	280	520	170	--	180	120	1300	5600	65	105	125	45	20
BH117 - [LAB_DUP]	3.0-3.4	Silty Clay	Fine	5.9	11	NA	100	200	220	1300	280	520	170	--	180	120	1300	5600	65	105	125	45	20
BH117 - [TRIPLICATE]	3.0-3.4	Silty Clay	Fine	5.9	11	NA	100	200	220	1300	280	520	--	--	--	--	--	--	--	--	--	--	--
BH118	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
BH118	0.6-0.8	Silty clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	--	180	120	1300	5600	65	105	125	45	20
BH119	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
BH119	0.9-1.1	Silty clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	--	180	120	1300	5600	65	105	125	45	20
BH120	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
BH120 - [LAB_DUP]	0-0.1	F: Silty Clay	Fine	NA	NA	NA	--	--	--	--	--	--	--	180	--	--	--	--	--	--	--	--	--
BH120	0.5-0.75	Silty Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	--	180	120	1300	5600	65	105	125	45	20
BH121	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
BH122	0.03-0.4	F: Gravelly Sand	Coarse	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	300	2800	50	85	70	105	20
BH122	1.0-1.45	Silty Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	--	180	120	1300	5600	65	105	125	45	20
SV1	0.5-0.8	F: Silty Sand	Coarse	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	300	2800	50	85	70	105	20
SDUP1	BH103 (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
SDUP2	BH102 (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
SDUP101	BH116 (0.015-0.45)	F: Gravelly Clay	Fine	7.5	16	17	100	410	240	1300	280	820	170	180	180	120	1300	5600	65	105	125	45	20
SDUP101 (Cr VI)	BH116 (0.015-0.45)	F: Gravelly Clay	Fine	NA	NA	NA	--	200	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SDUP102	BH116 (4.5-4.95)	Silty Gravelly Clay	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
SDUP103	BH101 (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
SDUP104	BH122 (0.03-0.4)	F: Gravelly Sand	Fine	NA	NA	NA	100	200	90	1300	35	190	170	180	180	120	1300	5600	65	105	125	45	20
SDUP104 - LAB DUP	BH122 (0.03-0.4)	F: Gravelly Sand	Fine	NA	NA	NA	--	--	--	--	--	--	170	--	180	120	1300	5600	65	105	125	45	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_DUP]	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)	F: Clayey sand	<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_DUP]	BH20 (0.05-0.2)	F: Clayey sand	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	F: Silty clay	<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_DUP]	BH15 0-0.1	F: Silty clay	<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
BH101	0-0.1	F: Silty Clay	**7**	<0.4	**59**	**37**	**26**	**0.1**	**13**	**47**	<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
BH101 - [LAB_DUP]	0-0.1	F: Silty Clay	**4**	<0.4	**48**	**46**	**22**	<0.1	**15**	**41**	<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
BH101	0.5-0.7	Silty Clay	<4	<0.4	**11**	**11**	**7**	<0.1	**1**	**6**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH102	0-0.2	F: Silty Clay	<4	<0.4	**35**	**28**	**13**	<0.1	**11**	**38**	<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
BH102 - [LAB_DUP]	0-0.2	F: Silty Clay	<4	<0.4	**37**	**28**	**13**	<0.1	**11**	**37**	**1.8**	**0.2**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH102	0.65-0.9	Silty clay	<4	<0.4	**21**	**28**	**13**	<0.1	**5**	**22**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH103	0-0.2	F: Silty Clay	**4**	<0.4	**51**	**30**	**16**	<0.1	**14**	**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
BH104	0-0.2	F: Silty Clay	<4	<0.4	**33**	**40**	**11**	<0.1	**8**	**31**	<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
BH105	0-0.2	F: Silty Clay	<4	<0.4	**13**	**24**	**47**	<0.1	**6**	**74**	**0.59**	**0.1**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH105	0.4-0.7	Silty clay	<4	<0.4	**11**	**10**	**10**	<0.1	**3**	**22**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH106	0-0.2	F: Silty Clay	<4	<0.4	**39**	**17**	**13**	<0.1	**7**	**19**	<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
BH107	0.01-0.46	F: Silty Clayey Sand	<4	<0.4	**27**	**3**	**3**	<0.1	**14**	**5**	<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
BH107	1.5-1.95	Silty Clay	**5**	<0.4	**48**	**12**	**31**	**0.2**	**6**	**14**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH108	0-0.2	F: Silty Clay	**4**	<0.4	**14**	**17**	**23**	<0.1	**6**	**47**	<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
BH109	0-0.2	F: Silty Clay	**26**	<0.4	**17**	**52**	**37**	<0.1	**11**	**100**	**0.07**	**0.07**	<0.1	<0.1	<0.1	**0.2**	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	Not Detected
BH109 - [LAB_DUP]	0-0.2	F: Silty Clay	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.1	NA	NA	**0.3**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH109	0.8-1	Silty clay	**50**	<0.4	**13**	**16**	**20**	<0.1	**6**	**49**	<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
BH110	0-0.2	F: Silty Clay	<4	<0.4	**42**	**48**	**13**	<0.1	**7**	**49**	<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
BH110 - [LAB_DUP]	0-0.2	F: Silty Clay	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH111	0-0.2	F: Silty Clay	**10**	<0.4	**45**	**30**	**20**	<0.1	**20**	**46**	<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
BH112	0-0.2	F: Silty Clay	**79**	**0.5**	**66**	**36**	**64**	**0.4**	**52**	**98**	<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
BH112	0.4-0.6	Silty clay	**72**	<0.4	**53**	**27**	**56**	**0.5**	**50**	**83**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH113	0-0.1	F: Silty Clay	**120**	<0.4	**43**	**21**	**55**	**0.1**	**11**	**51**	<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
BH113	0.1-0.45	F: Silty Clay	<4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH113	0.6-0.95	Silty clay	<4	<0.4	**27**	**8**	**13**	<0.1	**4**	**10**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH114	0-0.2	F: Silty Clay	**4**	<0.4	**19**	**8**	**9**	<0.1	**7**	**12**	<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
BH114 - [LAB_DUP]	0-0.2	F: Silty Clay	**4**	<0.4	**20**	**8**	**10**	<0.1	**6**	**12**	<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
BH115	0.01-0.2	F: Gravelly Clay	<4	<0.4	**34**	**5**	**5**	<0.1	**20**	**10**	<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
BH116	0.015-0.45	F: Gravelly Clay	**4**	<0.4	**120**	**59**	**3**	<0.1	**54**	**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
BH116 - [LAB_DUP]	0.015-0.45	F: Gravelly Clay	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<50	<100	<100	<50	NA	NA	NA	NA	NA
BH116 (Cr VI)	0.015-0.45	F: Gravelly Clay	NA	NA	**120**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH116	1.5-1.95	Silty Clay	**5**	<0.4	**46**	**12**	**19**	<0.1	**5**	**15**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH116	4.5-4.95	Silty Gravelly Clay	**25**	<0.4	**85**	**98**	**37**	<0.1	**21**	**43**	<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
BH117	0.01-0.4	F: Gravelly Clay	**10**	<0.4	**280**	**110**	**5**	<0.1	**130**	**38**	<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
BH117 (Cr VI)	0.01-0.4	F: Gravelly Clay	NA	NA	**2**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH117	0.7-0.95	F: Gravelly Clay	<4	<0.4	**31**	**12**	**22**	<0.1	**6**	**13**	<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
BH117 - [LAB_DUP]	0.7-0.95	F: Gravelly Clay	<4	<0.4	**37**	**12**	**21**	<0.1	**6**	**13**	<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
BH117	1.6-1.95	Silty Clay	<4	<0.4	**18**	**11**	**8**	<0.1	**4**	**20**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH117	3.0-3.4	Silty Clay	**16**	<0.4	**54**	**170**	**17**	<0.1	**17**	**65**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH117 - [LAB_DUP]	3.0-3.4	Silty Clay	**11**	<0.4	**23**	**180**	**26**	<0.1	**16**	**61**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH117 - [TRIPLICATE]	3.0-3.4	Silty Clay	**11**	<0.4	**13**	**200**	**14**	<0.1	**17**	**71**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH118	0-0.2	F: Silty Clay	<4	<0.4	**15**	**16**	**16**	<0.1	**5**	**21**	<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
BH118	0.6-0.8	Silty clay	<4	<0.4	**21**	**12**	**11**	<0.1	**6**	**17**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH119	0-0.2	F: Silty Clay	<4	<0.4	**33**	**26**	**21**	<0.1	**8**	**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
BH119	0.9-1.1	Silty clay	<4	<0.4	**38**	**11**	**14**	<0.1	**5**	**10**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH120	0-0.1	F: Silty Clay	**6**	<0.4	**61**	**13**	**18**	<0.1	**6**	**13**	<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
BH120 - [LAB_DUP]	0-0.1	F: Silty Clay	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH120	0.5-0.75	Silty Clay	**5**	<0.4	**38**	**15**	**40**	<0.1	**6**	**13**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
BH121	0-0.1	F: Silty Clay	**85**	<0.4	**31**	**22**	**53**	<0.1	**14**	**64**	<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
BH122	0.03-0.4	F: Gravelly Sand	<4	<0.4	**7**	**40**	**2**	<0.1	**2**	**4**	<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
BH122	1.0-1.45	Silty Clay	<4	<0.4	**26**	**9**	**16**	<0.1	**4**	**11**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
SV1	0.5-0.8	F: Silty Sand	**9**	<0.4	**39**	**15**	**9**	<0.1	**12**	**17**	<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
SDUP1	BH103 (0-0.2)	F: Silty Clay	**5**	<0.4	**38**	**35**	**13**	<0.1	**10**	**34**	<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
SDUP2	BH102 (0-0.2)	F: Silty Clay	<4	<0.4	**39**	**27**	**14**	<0.1	**12**	**52**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	**180**	**230**	**410**	<0.2	<0.5	<1	<1	NA
SDUP101	BH116 (0.015-0.45)	F: Gravelly Clay	**10**	<0.4	**250**	**93**	**6**	<0.1	**110**	**34**	<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
SDUP101 (Cr VI)	BH116 (0.015-0.45)	F: Gravelly Clay	NA	NA	**1**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SDUP102	BH116 (4.5-4.95)	Silty Gravelly Clay	**17**	<0.4	**51**	**66**	**19**	<0.1	**15**	**34**	<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
SDUP103	BH101 (0-0.1)	F: silty clay	**4**	<0.4	**44**	**38**	**16**	<0.1	**13**	**40**	<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
SDUP104	BH122 (0.03-0.4)	F: Gravelly Sand	<4	<0.4	**7**	**62**	**2**	<0.1	**1**	**6**	<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
SDUP104 - LAB DUP	BH122 (0.03-0.4)	F: Gravelly Sand	NA	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
Total Number of Samples (DSI samples only)			52	51	54	51	51	51	51	51	51	51	39	36	36	37	36	51	52	52	52	52	51	51	51	51	24
Maximum Value (DSI samples only)			120	0.5	280	200	64	0.5	130	100	1.8	0.2	<PQL	<PQL	<PQL	0.3	<PQL	<PQL	<PQL	180	230	410	<PQL	<PQL	<PQL	<PQL	Not Detected
Statistical Analysis on Fill Samples																											
Number of Fill Samples			**37**	NC	**36**	NC	**36**	NC	**36**	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Mean Value			**24**	NC	**61**	NC	**25**	NC	**31**	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Standard Deviation			**33.9**	NC	**84.5**	NC	**43.4**	NC	**64.4**	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
% UCL			**95**	NC	**95**	NC	**95**	NC	**95**	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
UCL Value			**32.09**	NC	**122.5**	NC	**40.97**	NC	**77.68**	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

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	Chromium	Lead	Nickel
PQL - Envirolab Services			0.05	0.01	0.03	0.02
TCLP1 - General Solid Waste			5	5	5	2
TCLP2 - Restricted Solid Waste			20	20	20	8
TCLP3 - Hazardous Waste			>20	>20	>20	>8
Sample Reference	**Sample Depth**	**Sample Description**				
BH1	0.5-0.8	F: Gravelly clayey sand	NA	<0.01	NA	**0.05**
BH3	0.4-0.65	F: Silty clay	NA	NA	**0.08**	NA
BH20	0.5-0.7	F: Gravelly sand	NA	<0.01	NA	**0.06**
BH112	0-0.2	F: Silty Clay	NA	NA	NA	**0.02**
BH112	0.4-0.6	Silty clay	NA	NA	NA	**0.04**
BH113	0-0.1	F: Silty Clay	<0.05	NA	NA	NA
BH116	0.015-0.45	F: Gravelly Clay	NA	<0.01	NA	**0.04**
BH117	0.01-0.4	F: Gravelly Clay	NA	<0.01	NA	**0.03**
SDUP101	BH116 (0.015-0.45)	F: Gravelly Clay	NA	<0.01	NA	**0.02**
Total Number of samples (DSI samples only)			1	3	0	5
Maximum Value (DSI Samples only)			<PQL	<PQL	NA	0.04

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

Detailed Site Investigation
3 Osman Street, Blayney, NSW
E35521PT

JKEnvironments

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	BH103	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1
laboratory	SDUP1	BH103 (0-0.2)	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc
Intra	BH116	0.015-0.45	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1
laboratory	SDUP101	BH116 (0.015-0.45)	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc
Intra	BH101	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1
laboratory	SDUP103	BH101 (0-0.1)	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc
Inter	BH102	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1
laboratory	SDUP2	BH102 (0-0.2)	<25	<50	340	120	<0.2	<0.5	<1	<2	<1
duplicate	MEAN		nc	nc	195	85	nc	nc	nc	nc	nc
	RPD %		nc	nc	149%	82%	nc	nc	nc	nc	nc
Inter	BH116	4.5-4.95	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1
laboratory	SDUP102	BH116 (4.5-4.95)	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc
Inter	BH122	0.03-0.4	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1
laboratory	SDUP104	BH122 (0.03-0.4)	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc
Field	TB1	-	<25	-	-	-	<0.2	<0.5	<1	<2	<1
Blank	22/05/23										
Trip	TS1		-	-	-	-	100%	99%	100%	100%	100%
Spike	22/05/23										
Field	FR-AUGER	µg/L*	39	<50	<100	<100	<1	<1	<1	<2	<1
Rinsate	18/05/23										
Field	FR-S101-SPT	µg/L*	<10	<50	<100	<100	<1	<1	<1	<2	<1
Rinsate	22/05/23										

			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	BH103	0-0.2	<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
laboratory	SDUP1	BH103 (0-0.2)	<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
duplicate	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
Intra	BH116	0.015-0.45	<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
laboratory	SDUP101	BH116 (0.015-0.45)	<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
duplicate	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
Intra	BH101	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
laboratory	SDUP103	BH101 (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
duplicate	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	BH102	0-0.2	<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
laboratory	SDUP2	BH102 (0-0.2)	<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
duplicate	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	BH116	4.5-4.95	<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
laboratory	SDUP102	BH116 (4.5-4.95)	<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
duplicate	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	BH122	0.03-0.4	<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
laboratory	SDUP104	BH122 (0.03-0.4)	<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
duplicate	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	TB1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Blank	22/05/23																
Trip	TS1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spike	22/05/23																
Field	FR-AUGER	µg/L*	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1
Rinsate	18/05/23																
Field	FR-S101-SPT	µg/L*	<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
Rinsate	22/05/23																

			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	BH103	0-0.2	<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
laboratory	SDUP1	BH103 (0-0.2)	<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
duplicate	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
Intra	BH116	0.015-0.45	<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
laboratory	SDUP101	BH116 (0.015-0.45)	<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
duplicate	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
Intra	BH101	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
laboratory	SDUP103	BH101 (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
duplicate	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	BH102	0-0.2	<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
laboratory	SDUP2	BH102 (0-0.2)	<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
duplicate	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	BH116	4.5-4.95	<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
laboratory	SDUP102	BH116 (4.5-4.95)	<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
duplicate	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	BH122	0.03-0.4	<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
laboratory	SDUP104	BH122 (0.03-0.4)	<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
duplicate	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	TB1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Blank	22/05/23																					
Trip	TS1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spike	22/05/23																					
Field	FR-AUGER	µg/L*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rinsate	18/05/23																					
Field	FR-S101-SPT	µg/L*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rinsate	22/05/23																					

			Azinphos-methyl (Guthion	Bromophos-ethyl	Chlorpyriphos	Chlorpyriphos-methyl	Diazinon	Dichlorvos	Dimethoate	Ethion	Fenitrothion	Malathion	Parathion	Ronnel	Total PCBS
	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*
	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*
Intra	BH103	0-0.2	<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
laboratory	SDUP1	BH103 (0-0.2)	<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
duplicate	MEAN		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
Intra	BH116	0.015-0.45	<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
laboratory	SDUP101	BH116 (0.015-0.45)	<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
duplicate	MEAN		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
Intra	BH101	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
laboratory	SDUP103	BH101 (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
duplicate	MEAN		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
Inter	BH102	0-0.2	<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
laboratory	SDUP2	BH102 (0-0.2)	<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
duplicate	MEAN		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
Inter	BH116	4.5-4.95	<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
laboratory	SDUP102	BH116 (4.5-4.95)	<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
duplicate	MEAN		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
Inter	BH122	0.03-0.4	<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
laboratory	SDUP104	BH122 (0.03-0.4)	<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
duplicate	MEAN		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
Field	TB1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Blank	22/05/23														
Trip	TS1		-	-	-	-	-	-	-	-	-	-	-	-	-
Spike	22/05/23														
Field	FR-AUGER	µg/L*	-	-	-	-	-	-	-	-	-	-	-	-	-
Rinsate	18/05/23														
Field	FR-S101-SPT	µg/L*	-	-	-	-	-	-	-	-	-	-	-	-	-
Rinsate	22/05/23														

			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
	PQL Envirolab SYD		*4*	*0.4*	*1*	*1*	*1*	*0.1*	*1*	*1*
	PQL Envirolab VIC		*4.0*	*0.4*	*1.0*	*1.0*	*1.0*	*0.1*	*1.0*	*1.0*
Intra	BH103	0-0.2	4	<0.4	51	30	16	<0.1	14	32
laboratory	SDUP1	BH103 (0-0.2)	5	<0.4	38	35	13	<0.1	10	34
duplicate	MEAN		4.5	nc	44.5	32.5	14.5	nc	12	33
	RPD %		22%	nc	29%	15%	21%	nc	33%	6%
Intra	BH116	0.015-0.45	4	<0.4	120	59	3	<0.1	54	23
laboratory	SDUP101	BH116 (0.015-0.45)	10	<0.4	250	93	6	<0.1	110	34
duplicate	MEAN		7	nc	185	76	4.5	nc	82	28.5
	RPD %		86%	nc	70%	45%	67%	nc	68%	39%
Intra	BH101	0-0.1	7	<0.4	59	37	26	0.1	13	47
laboratory	SDUP103	BH101 (0-0.1)	4	<0.4	44	38	16	<0.1	13	40
duplicate	MEAN		5.5	nc	51.5	37.5	21	0.075	13	43.5
	RPD %		55%	nc	29%	3%	48%	67%	0%	16%
Inter	BH102	0-0.2	<4	<0.4	35	28	13	<0.1	11	38
laboratory	SDUP2	BH102 (0-0.2)	<4	<0.4	39	27	14	<0.1	12	52
duplicate	MEAN		nc	nc	37	27.5	13.5	nc	11.5	45
	RPD %		nc	nc	11%	4%	7%	nc	9%	31%
Inter	BH116	4.5-4.95	25	<0.4	85	98	37	<0.1	21	43
laboratory	SDUP102	BH116 (4.5-4.95)	17	<0.4	51	66	19	<0.1	15	34
duplicate	MEAN		21	nc	68	82	28	nc	18	38.5
	RPD %		38%	nc	50%	39%	64%	nc	33%	23%
Inter	BH122	0.03-0.4	<4	<0.4	7	40	2	<0.1	2	4
laboratory	SDUP104	BH122 (0.03-0.4)	<4	<0.4	7	62	2	<0.1	1	6
duplicate	MEAN		nc	nc	7	51	2	nc	1.5	5
	RPD %		nc	nc	0%	43%	0%	nc	67%	40%
Field	TB1	-	-	-	-	-	-	-	-	-
Blank	22/05/23									
Trip	TS1		-	-	-	-	-	-	-	-
Spike	22/05/23									
Field	FR-AUGER	µg/L*	<0.05	<0.01	<0.01	0.7	<0.03	<0.0005	<0.02	<0.02
Rinsate	18/05/23									
Field	FR-S101-SPT	µg/L*	<0.05	<0.01	<0.01	0.07	<0.03	<0.0005	<0.02	<0.02
Rinsate	22/05/23									

Result outside of QA/QC acceptance criteria
* All rinstae results reported in µg/L, with the exception of metals whih are reported in mg/L

ABBREVIATIONS AND EXPLANATIONS

Abbreviations used in the Tables:

NA:	Not Analysed
NC or nc:	Not Calculated
NEPM:	National Environmental Protection Measure
NL:	Not Limiting
NSL:	No Set Limit
ppm:	Parts per million
PAHs	Polycyclic Aromatic Hydrocarbons
PQL:	Practical Quantitation Limit
TRH:	Total Recoverable Hydrocarbons
USEPA	United States Environmental Protection Agency
VOC:	Volatile Organic Compounds
RPD:	Relative Percentage Difference

TABLE SV1
SOIL VAPOUR LABORATORY RESULTS
All results in ug/m3 unless stated otherwise.

	SAC	SAC	SAMPLES			
	USEPA**	NEPM (2013)	SV1	SV1 LAB DUP	SV2	SVDUP1 SV1
Total Petroleum Hydrocarbons (TPH)						
TPH F1	See NEPM	180,000	<200	<200	<200	<200
TPH F2	See NEPM	130,000	**130**	**120**	**210**	**100**
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)						
Benzene	See NEPM	1,000	**190**	**190**	**6**	**190**
Toluene	See NEPM	130,000	**99**	**100**	**70**	**100**
Ethylbenzene	See NEPM	33,000	**10**	**10**	**10**	**10**
Xylenes	See NEPM	22,000	**40**	**40**	**60**	**50**
Polycyclic Aromatic Hydrocarbons (PAHs)						
Naphthalene	See NEPM	800	<2.6	<2.6	<2.6	<2.6
Volatile Organic Compounds (VOCs), including chlorinated VOCs #						
Vinyl Chloride	See NEPM	30	<1.3	<1.3	<1.3	<1.3
Cis-1,2-dichloroethene	See NEPM	80	<2	<2	<2	<2
Trichloroethene (TCE)	See NEPM	20	<2.7	<2.7	<2.7	<2.7
Tetrachloroethene (PCE)	See NEPM	2,000	<3.4	<3.4	<3.4	<3.4
1,1,1-Trichloroethane	See NEPM	60,000	<2.7	<2.7	<2.7	<2.7
Acetone	NSL	NSL	**150**	**150**	<11.9	**150**
Bromodichloromethane	25.3	NSL	**20**	**20**	**20**	**30**
1,3-Butadiene	31.2	NSL	**87**	**90**	**13**	**91**
Carbon Disulfide	24,300	NSL	**20**	**20**	<16	**20**
Chloroform	40.7	NSL	**250**	**250**	**250**	**250**
Chloromethane	3,130	NSL	**7**	**7**	<1	**8**
Cyclohexane	209,000	NSL	**2**	**2**	<1.7	**2**
4-ethyl toluene	NSL	NSL	**4**	**4**	**5**	**4**
Ethanol	NSL	NSL	**40**	**40**	**40**	**30**
Heptane	13,900	NSL	**20**	**20**	**7**	**20**
Hexane	24,300	NSL	**24**	**24**	**20**	**25**
Isopropyl Alcohol	6,950	NSL	**10**	**10**	<12	<12
MEK	174,000	NSL	**23**	**23**	<15	**20**
Propylene	104,000	NSL	**320**	**330**	**240**	**350**
Styrene	34,800	NSL	**5**	**5**	**2**	**3**
Trichlorofluoromethane(Freon 11)	NSL	NSL	<2.8	<2.8	**10**	<2.8
1,2,4-Trimethylbenzene	2,090	NSL	**10**	**10**	**20**	**20**
1,3,5-Trimethylbenzene	2,090	NSL	**6**	**7**	**6**	**7**
1,4-Dichlorobenzene	85.1	NSL	**7**	**7**	**10**	**7**

Concentration above the VAC — Value
Concentration above the PQL — **Bold**

* No limit established as this is a tracer compound used for QA
** Target Sub-Slab and Near-source Soil Gas Concentration (TCR=1E-05 or THQ=1), groundwater temperature 20 degrees Celcius
# VOC data has only been tabulated for key compounds in NEPM 2013 Schedule B1 and others that were detected >PQL

TABLE Q3
SOIL VAPOUR QA/QC SUMMARY
All results in ug/m3 unless stated otherwise.

	Intra-laboratory Duplicate		
	SV1	SVDUP1	RPD %
Total Recoverable Hydrocarbons (TRH)			
TRH F1	<200	<200	NC
TRH F2	**130**	**100**	**27**
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)			
Benzene	**190**	**190**	0
Toluene	**99**	**100**	**1**
Ethylbenzene	**10**	**10**	0
m,p-Xylene	**30**	**10**	**100**
o-Xylene	**30**	**20**	**40**
Polycyclic Aromatic Hydrocarbons (PAHs)			
Naphthalene	<2.6	<2.6	NC
Volatile Organic Compounds (VOCs), including chlorinated VOCs #			
Vinyl Chloride	<1.3	<1.3	NC
Cis-1,2-dichloroethene	<2	<2	NC
Trichloroethene (TCE)	<2.7	<2.7	NC
Tetrachloroethene (PCE)	<3.4	<3.4	NC
1,1,1-Trichloroethane	<2.7	<2.7	NC
Acetone	**150**	**150**	0
Bromodichloromethane	**20**	**30**	**40**
1,3-Butadiene	**87**	**91**	**4**
Carbon Disulfide	**20**	**20**	0
Chloroform	**250**	**250**	0
Chloromethane	**7**	**8**	**13**
Cyclohexane	**2**	**2**	0
4-ethyl toluene	**4**	**4**	0
Ethanol	**40**	**30**	**29**
Heptane	**20**	**20**	0
Hexane	**24**	**25**	**4**
Isopropyl Alcohol	**10**	<12	**18**
MEK	**23**	**20**	**14**
Propylene	**320**	**350**	**9**
Styrene	**5**	**3**	**50**
1,2,4-Trimethylbenzene	**10**	**20**	**67**
1,3,5-Trimethylbenzene	**6**	**7**	**15**
1,4-Dichlorobenzene	**7**	**7**	0

Exceedance of QA/QC criteria **Value**

** Target Sub-Slab and Near-source Soil Gas Concentration (TCR=1E-05 or THQ=1)
# VOC data has only been tabulated for compounds with detection above the PQLs

	Shroud Leak Test	Isopropanol (Shroud) - From SV1	Isopropanol SV1 concentration
Isopropanol (ug/m3)		260000	10

Result outside of QA/QC acceptance criteria **Value**

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	PSI SAMPLES							DSI SAMPLES									
			MW1	MW1 LAB DUP	MW12	MW15	WDUP1	WDUP2	WDUP2	MW12	MW12 - LAB DUP	MW14	MW15	MW101	MW116	MW117	WDUP1	WDUP2	WDUP2 - LAB DUP
Inorganic Compounds and Parameters																			
pH		6.5 - 8.5	6.8	NA	7.1	6.4	NA	NA	NA	6.7	6.7	7.1	6	6.6	6.1	6.1	NA	NA	NA
Electrical Conductivity (µS/cm)	1	NSL	**210**	NA	**1200**	**340**	NA	NA	NA	**1100**	**1100**	**1600**	**360**	**1900**	**220**	**230**	NA	NA	NA
Metals and Metalloids																			
Arsenic (As III)	1	24	<1	<1	<1	<1	<1	<1	NA	<1	<1	<1	<1	**1**	**1**	<1	<1	**1**	**1**
Cadmium	0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium (SAC for Cr III adopted)	1	3.3	<1	<1	<1	<1	<1	<1	NA	**1**	**1**	<1	<1	**2**	**4**	<1	<1	**4**	**4**
Copper	1	1.4	<1	<1	<1	<1	<1	<1	NA	**1**	**1**	<1	<1	<1	<1	**1**	<1	<1	<1
Lead	1	3.4	<1	<1	<1	<1	<1	<1	NA	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Total Mercury (inorganic)	0.05	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	NA	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel	1	11	**2**	**2**	<1	**3**	**3**	**2**	NA	<1	<1	<1	**2**	**3**	**2**	**1**	**1**	**2**	**2**
Zinc	1	8	**25**	**25**	**15**	**29**	**29**	**25**	NA	**2**	**2**	**7**	**6**	**20**	**26**	**19**	**18**	**27**	**27**
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)																			
Benzene	1	950	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Toluene	1	180	<1	<1	<1	<1	<1	<1	<1	**1**	**1**	<1	<1	<1	<1	<1	<1	<1	NA
Ethylbenzene	1	80	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
m+p-xylene	2	75	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	NA
o-xylene	1	350	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Total xylenes	2	NSL	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	NA
Volatile Organic Compounds (VOCs), including chlorinated VOCs																			
Dichlorodifluoromethane	10	NSL	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
Chloromethane	10	NSL	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
Vinyl Chloride	10	100	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
Bromomethane	10	NSL	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
Chloroethane	10	NSL	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
Trichlorofluoromethane	10	NSL	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
1,1-Dichloroethene	1	700	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Trans-1,2-dichloroethene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1-dichloroethane	1	90	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Cis-1,2-dichloroethene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Bromochloromethane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Chloroform	1	370	**12**	**10**	<1	<1	<1	**11**	**12**	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
2,2-dichloropropane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2-dichloroethane	1	1900	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1,1-trichloroethane	1	270	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1-dichloropropene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Cyclohexane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Carbon tetrachloride	1	240	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Benzene	1	950	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Dibromomethane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2-dichloropropane	1	900	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Trichloroethene	1	330	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Bromodichloromethane	1	NSL	**3**	**2**	<1	<1	<1	**2**	**2**	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
trans-1,3-dichloropropene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
cis-1,3-dichloropropene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1,2-trichloroethane	1	6500	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Toluene	1	180	<1	<1	<1	<1	<1	<1	<1	**1**	**1**	<1	<1	<1	<1	<1	<1	<1	NA
1,3-dichloropropane	1	1100	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Dibromochloromethane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2-dibromoethane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Tetrachloroethene	1	70	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1,1,2-tetrachloroethane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Chlorobenzene	1	55	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Ethylbenzene	1	80	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Bromoform	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
m+p-xylene	2	75	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	NA
Styrene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1,2,2-tetrachloroethane	1	400	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
o-xylene	1	350	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2,3-trichloropropane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Isopropylbenzene	1	30	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Bromobenzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
n-propyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
2-chlorotoluene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
4-chlorotoluene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,3,5-trimethyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Tert-butyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2,4-trimethyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,3-dichlorobenzene	1	260	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Sec-butyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,4-dichlorobenzene	1	60	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
4-isopropyl toluene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2-dichlorobenzene	1	160	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
n-butyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2-dibromo-3-chloropropane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2,4-trichlorobenzene	1	85	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Hexachlorobutadiene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2,3-trichlorobenzene	1	3	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Polycyclic Aromatic Hydrocarbons (PAHs)																			
Naphthalene	0.2	16	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	NA	<0.2	<0.2	<0.2	<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	<0.1	<0.1	<0.1	<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	<0.1	<0.1	<0.1	<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	<0.1	<0.1	<0.1	<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	<0.1	<0.1	<0.1	<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	<0.1	<0.1	<0.1	<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	<0.1	<0.1	<0.1	<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	<0.1	<0.1	<0.1	<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	<0.1	<0.1	<0.1	<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	<0.1	<0.1	<0.1	<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	<0.2	<0.2	<0.2	<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	<0.1	<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	<0.1	<0.1	<0.1	<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	<0.1	<0.1	<0.1	<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	<0.1	<0.1	<0.1	<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)	PSI SAMPLES							DSI SAMPLES									
			MW1	MW1 LAB DUP	MW12	MW15	WDUP1	WDUP2	WDUP2	MW12	MW12 - LAB DUP	MW14	MW15	MW101	MW116	MW117	WDUP1	WDUP2	WDUP2 - LAB DUP
Inorganic Compounds and Parameters																			
pH		6.5 - 8.5	6.8	NA	7.1	6.4	NA	NA	NA	6.7	6.7	7.1	6	6.6	6.1	6.1	NA	NA	NA
Electrical Conductivity (µS/cm)	1	NSL	**210**	NA	**1200**	**340**	NA	NA	NA	**1100**	**1100**	**1600**	**360**	**1900**	**220**	**230**	NA	NA	NA
Metals and Metalloids																			
Arsenic (As III)	1	100	<1	<1	<1	<1	<1	<1	NA	<1	<1	<1	<1	**1**	**1**	<1	<1	**1**	**1**
Cadmium	0.1	20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium (total)	1	500	<1	<1	<1	<1	<1	<1	NA	**1**	**1**	<1	<1	**2**	**4**	<1	<1	**4**	**4**
Copper	1	20000	<1	<1	<1	<1	<1	<1	NA	**1**	**1**	<1	<1	<1	<1	**1**	<1	<1	<1
Lead	1	100	<1	<1	<1	<1	<1	<1	NA	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Total Mercury (inorganic)	0.05	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	NA	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel	1	200	**2**	**2**	<1	**3**	**3**	**2**	NA	<1	<1	<1	**2**	**3**	**2**	**1**	**1**	**2**	**2**
Zinc	1	30000	**25**	**25**	**15**	**29**	**29**	**25**	NA	**2**	**2**	**7**	**6**	**20**	**26**	**19**	**18**	**27**	**27**
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)																			
Benzene	1	10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Toluene	1	8000	<1	<1	<1	<1	<1	<1	<1	**1**	**1**	<1	<1	<1	<1	<1	<1	<1	NA
Ethylbenzene	1	3000	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
m+p-xylene	2	NSL	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	NA
o-xylene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Total xylenes	2	6000	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	NA
Volatile Organic Compounds (VOCs), including chlorinated VOCs																			
Dichlorodifluoromethane	10	NSL	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
Chloromethane	10	NSL	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
Vinyl Chloride	10	3	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
Bromomethane	10	NSL	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
Chloroethane	10	NSL	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
Trichlorofluoromethane	10	NSL	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
1,1-Dichloroethene	1	300	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Trans-1,2-dichloroethene	1	600	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1-dichloroethane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Cis-1,2-dichloroethene	1	600	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Bromochloromethane	1	2500	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Chloroform	1		**12**	**10**	<1	<1	<1	**11**	**12**	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
2,2-dichloropropane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2-dichloroethane	1	30	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1,1-trichloroethane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1-dichloropropene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Cyclohexane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Carbon tetrachloride	1	30	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Benzene	1	10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Dibromomethane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2-dichloropropane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Trichloroethene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Bromodichloromethane	1	NSL	**3**	**2**	<1	<1	<1	**2**	**2**	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
trans-1,3-dichloropropene	1	1000	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
cis-1,3-dichloropropene	1	1000	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1,2-trichloroethane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Toluene	1	8000	<1	<1	<1	<1	<1	<1	<1	**1**	**1**	<1	<1	<1	<1	<1	<1	<1	NA
1,3-dichloropropane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Dibromochloromethane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2-dibromoethane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Tetrachloroethene	1	500	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1,1,2-tetrachloroethane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Chlorobenzene	1	3000	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Ethylbenzene	1	3000	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Bromoform	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
m+p-xylene	2	NSL	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	NA
Styrene	1	300	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1,2,2-tetrachloroethane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
o-xylene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2,3-trichloropropane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Isopropylbenzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Bromobenzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
n-propyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
2-chlorotoluene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
4-chlorotoluene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,3,5-trimethyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Tert-butyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2,4-trimethyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,3-dichlorobenzene	1	200	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Sec-butyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,4-dichlorobenzene	1	400	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
4-isopropyl toluene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2-dichlorobenzene	1	15000	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
n-butyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2-dibromo-3-chloropropane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2,4-trichlorobenzene	1	300	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2,3-trichlorobenzene	1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Hexachlorobutadiene	1	7	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Polycyclic Aromatic Hydrocarbons (PAHs)																			
Naphthalene	0.2	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	NA	<0.2	<0.2	<0.2	<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	<0.1	<0.1	<0.1	<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	<0.1	<0.1	<0.1	<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	<0.1	<0.1	<0.1	<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	<0.1	<0.1	<0.1	<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	<0.1	<0.1	<0.1	<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	<0.1	<0.1	<0.1	<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	<0.1	<0.1	<0.1	<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	<0.1	<0.1	<0.1	<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	<0.1	<0.1	<0.1	<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	<0.2	<0.2	<0.2	<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	<0.1	<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	<0.1	<0.1	<0.1	<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	<0.1	<0.1	<0.1	<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	<0.1	<0.1	<0.1	<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	PSI SAMPLES							DSI SAMPLES									
			MW1	MW1 LAB DUP	MW12	MW15	WDUP1	WDUP2	WDUP2	MW12	MW12 - LAB DUP	MW14	MW15	MW101	MW116	MW117	WDUP1	WDUP2	WDUP2 - LAB DUP
Inorganic Compounds and Parameters																			
pH		6.5 - 8.5	6.8	NA	7.1	6.4	NA	NA	NA	6.7	6.7	7.1	6	6.6	6.1	6.1	NA	NA	NA
Electrical Conductivity (µS/cm)	1	NSL	**210**	NA	**1200**	**340**	NA	NA	NA	**1100**	**1100**	**1600**	**360**	**1900**	**220**	**230**	NA	NA	NA
Metals and Metalloids																			
Arsenic (As III)	1	10	<1	<1	<1	<1	<1	<1	NA	<1	<1	<1	<1	**1**	**1**	<1	<1	**1**	**1**
Cadmium	0.1	2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium (total)	1	50	<1	<1	<1	<1	<1	<1	NA	**1**	**1**	<1	<1	**2**	**4**	<1	<1	**4**	**4**
Copper	1	2000	<1	<1	<1	<1	<1	<1	NA	**1**	**1**	<1	<1	<1	<1	**1**	<1	<1	<1
Lead	1	10	<1	<1	<1	<1	<1	<1	NA	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Total Mercury (inorganic)	0.05	1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	NA	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel	1	20	**2**	**2**	<1	**3**	**3**	**2**	NA	<1	<1	<1	**2**	**3**	**2**	**1**	**1**	**2**	**2**
Zinc	1	3000	**25**	**25**	**15**	**29**	**29**	**25**	NA	**2**	**2**	**7**	**6**	**20**	**26**	**19**	**18**	**27**	**27**
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)																			
Benzene	1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Toluene	1	800	<1	<1	<1	<1	<1	<1	<1	**1**	**1**	<1	<1	<1	<1	<1	<1	<1	NA
Ethylbenzene	1	300	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
m+p-xylene	2	NSL	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	NA
o-xylene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Total xylenes	2	600	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	NA
Volatile Organic Compounds (VOCs), including chlo	1																		
Dichlorodifluoromethane	10	NSL	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
Chloromethane	10	NSL	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
Vinyl Chloride	10	0.3	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
Bromomethane	10	NSL	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
Chloroethane	10	NSL	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
Trichlorofluoromethane	10	NSL	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
1,1-Dichloroethene	1	30	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Trans-1,2-dichloroethene	1	60	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1-dichloroethane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Cis-1,2-dichloroethene	1	60	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Bromochloromethane	1	250	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Chloroform	1		**12**	**10**	<1	<1	<1	**11**	**12**	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
2,2-dichloropropane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2-dichloroethane	1	3	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1,1-trichloroethane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1-dichloropropene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Cyclohexane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Carbon tetrachloride	1	3	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Benzene	1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Dibromomethane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2-dichloropropane	2	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Trichloroethene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Bromodichloromethane	2	NSL	**3**	**2**	<1	<1	<1	**2**	**2**	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
trans-1,3-dichloropropene	1	100	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
cis-1,3-dichloropropene	1	100	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1,2-trichloroethane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Toluene	1	800	<1	<1	<1	<1	<1	<1	<1	**1**	**1**	<1	<1	<1	<1	<1	<1	<1	NA
1,3-dichloropropane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Dibromochloromethane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2-dibromoethane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Tetrachloroethene	1	50	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1,1,2-tetrachloroethane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Chlorobenzene	1	300	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Ethylbenzene	1	300	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Bromoform	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
m+p-xylene	2	NSL	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	NA
Styrene	1	30	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1,2,2-tetrachloroethane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
o-xylene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2,3-trichloropropane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Isopropylbenzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Bromobenzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
n-propyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
2-chlorotoluene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
4-chlorotoluene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,3,5-trimethyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Tert-butyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2,4-trimethyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,3-dichlorobenzene	1	20	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Sec-butyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,4-dichlorobenzene	1	40	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
4-isopropyl toluene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2-dichlorobenzene	1	1500	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
n-butyl benzene	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2-dibromo-3-chloropropane	1	NSL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2,4-trichlorobenzene	1	30	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2,3-trichlorobenzene	1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Hexachlorobutadiene	1	0.07	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Polycyclic Aromatic Hydrocarbons (PAHs)																			
Naphthalene	0.2	NSL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	NA	<0.2	<0.2	<0.2	<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	<0.1	<0.1	<0.1	<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	<0.1	<0.1	<0.1	<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	<0.1	<0.1	<0.1	<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	<0.1	<0.1	<0.1	<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	<0.1	<0.1	<0.1	<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	<0.1	<0.1	<0.1	<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	<0.1	<0.1	<0.1	<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	<0.1	<0.1	<0.1	<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	<0.1	<0.1	<0.1	<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	<0.2	<0.2	<0.2	<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	<0.1	<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	<0.1	<0.1	<0.1	<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	<0.1	<0.1	<0.1	<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	<0.1	<0.1	<0.1	<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	
PQL - Envirolab Services				10	50	1	1	1	2	1	PID
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
MW12	3.6	2m to <4m	Sand	<10	<50	<1	**1**	<1	<2	<1	0.2
MW12 - LAB DUP	3.6	2m to <4m	Sand	<10	<50	<1	**1**	<1	<2	<1	0.2
MW14	3	2m to <4m	Sand	<10	<50	<1	<1	<1	<2	<1	0.1
MW15	2.48	2m to <4m	Sand	<10	<50	<1	<1	<1	<2	<1	0
MW101	4.28	4m to <8m	Sand	<10	<50	<1	<1	<1	<2	<1	1.2
MW116	3.16	2m to <4m	Sand	<10	**54**	<1	<1	<1	<2	<1	1.4
MW117	2.81	2m to <4m	Sand	<10	<50	<1	<1	<1	<2	<1	0.7
WDUP1	2.81	2m to <4m	Sand	<10	<50	<1	<1	<1	<2	<1	NA
WDUP2	3.16	2m to <4m	Sand	<10	<50	<1	<1	<1	<2	<1	NA
WDUP2 - LAB DUP	3.16	2m to <4m	Sand	NA	NA	NA	NA	NA	NA	NA	NA
Total Number of Samples				9	9	9	9	9	9	9	7
Maximum Value				<PQL	54	<PQL	1	<PQL	<PQL	<PQL	1.4

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
MW12	3.6	2m to <4m	Sand	1000	1000	800	NL	NL	NL	NL
MW12 - LAB DUP	3.6	2m to <4m	Sand	1000	1000	800	NL	NL	NL	NL
MW14	3	2m to <4m	Sand	1000	1000	800	NL	NL	NL	NL
MW15	2.48	2m to <4m	Sand	1000	1000	800	NL	NL	NL	NL
MW101	4.28	4m to <8m	Sand	1000	1000	800	NL	NL	NL	NL
MW116	3.16	2m to <4m	Sand	1000	1000	800	NL	NL	NL	NL
MW117	2.81	2m to <4m	Sand	1000	1000	800	NL	NL	NL	NL
WDUP1	2.81	2m to <4m	Sand	1000	1000	800	NL	NL	NL	NL
WDUP2	3.16	2m to <4m	Sand	1000	1000	800	NL	NL	NL	NL
WDUP2 - LAB DUP	3.16	2m to <4m	Sand	NA	NA	NA	NA	NA	NA	NA

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	PSI SAMPLES							DSI SAMPLES								
					MW1	MW1 LAB DUP	MW12	MW15	WDUP1	WDUP2	WDUP2 LAB DUP	MW12	MW12 - LAB DUP	MW14	MW15	MW101	MW116	MW117	WDUP1	WDUP2	WDUP2 - LAB DUP
Total Recoverable Hydrocarbons (TRH)																					
C_6-C_9 Aliphatics (assessed using F1)	10	-	100	-	<10	<10	<10	<10	<10	**13**	**16**	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
>C_9-C_{14} Aliphatics (assessed using F2)	50	-	100	-	**120**	**120**	<50	<50	<50	**120**	NA	<50	<50	<50	<50	<50	**54**	<50	<50	<50	NA
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)																					
Benzene	1	1	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Toluene	1	800	-	-	<1	<1	<1	<1	<1	<1	<1	**1**	**1**	<1	<1	<1	<1	<1	<1	<1	NA
Ethylbenzene	1	300	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Total xylenes	2	600	-	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	NA
Polycyclic Aromatic Hydrocarbons (PAHs)																					
Naphthalene	1	-	-	6.1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Volatile Organic Compounds (VOCs), including chlorinated VOCs																					
Dichlorodifluoromethane	10	-	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
Chloromethane	10	-	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
Vinyl Chloride	10	0.3	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
Bromomethane	10	-	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
Chloroethane	10	-	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
Trichlorofluoromethane	10	-	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NA
1,1-Dichloroethene	1	30	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Trans-1,2-dichloroethene	1	60	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1-dichloroethane	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Cis-1,2-dichloroethene	1	60	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Bromochloromethane	1	250	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Chloroform	1		-	-	**12**	**10**	<1	<1	<1	**11**	**12**	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
2,2-dichloropropane	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2-dichloroethane	1	3	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1,1-trichloroethane	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1-dichloropropene	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Cyclohexane	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Carbon tetrachloride	1	3	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Benzene	1	1	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Dibromomethane	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2-dichloropropane	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Trichloroethene	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Bromodichloromethane	1	-	-	-	**3**	**2**	<1	<1	<1	**2**	**2**	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
trans-1,3-dichloropropene	1	100	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
cis-1,3-dichloropropene	1	100	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1,2-trichloroethane	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Toluene	1	800	-	-	<1	<1	<1	<1	<1	<1	<1	**1**	**1**	<1	<1	<1	<1	<1	<1	<1	NA
1,3-dichloropropane	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Dibromochloromethane	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2-dibromoethane	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Tetrachloroethene	1	50	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1,1,2-tetrachloroethane	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Chlorobenzene	1	300	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Ethylbenzene	1	300	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Bromoform	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
m+p-xylene	2	-	-	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	NA
Styrene	1	30	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,1,2,2-tetrachloroethane	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
o-xylene	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2,3-trichloropropane	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Isopropylbenzene	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Bromobenzene	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
n-propyl benzene	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
2-chlorotoluene	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
4-chlorotoluene	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,3,5-trimethyl benzene	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Tert-butyl benzene	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2,4-trimethyl benzene	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,3-dichlorobenzene	1	20	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Sec-butyl benzene	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,4-dichlorobenzene	1	40	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
4-isopropyl toluene	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2-dichlorobenzene	1	1500	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
n-butyl benzene	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2-dibromo-3-chloropropane	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2,4-trichlorobenzene	1	30	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
1,2,3-trichlorobenzene	1		-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
Hexachlorobutadiene	1	0.07	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA

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

TABLE Q3
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
	PQL Envirolab SYD	*10*	*10*	*10*	*10*	*10*	*10*	*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*
Intra	MW117	<10	<10	<10	<10	<10	<10	<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
duplicate	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	MW116	<10	<10	<10	<10	<10	<10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
laboratory	WDUP2	<10	<10	<10	<10	<10	<10	<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
	RPD %	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc

		1,2-dichloropropane	Trichloroethene	Bromodichloromethane	trans-1,3-dichloropropene	cis-1,3-dichloropropene	1,1,2-trichloroethane	Toluene	1,3-dichloropropane	Dibromochloromethane	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
	PQL Envirolab SYD	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*2*	*1*	*1*	*1*	*1*
	PQL Envirolab VIC	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*2*	*1*	*1*	*1*	*1*
Intra	MW117	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1
laboratory	WDUP1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<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
	RPD %	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Inter	MW116	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1
laboratory	WDUP2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<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
	RPD %	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc

		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*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
	PQL Envirolab VIC	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Intra	MW117	<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	<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
	RPD %	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Inter	MW116	<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	<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
	RPD %	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
	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*
	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*
Intra	MW117	<10	<50	<100	<100	<1	<1	<1	<2	<1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
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
duplicate	MEAN	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
Inter	MW116	<10	54	160	<100	<1	<1	<1	<2	<1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
laboratory	WDUP2	<10	<50	270	<100	<1	<1	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
duplicate	MEAN	nc	39.5	215	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
	RPD %	nc	73%	51%	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc
Field	TB-W1	<10	<50	<100	<100	<1	<1	<1	<2	<1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Blank	23-25/05/2023																
Trip	TS-W1	-	-	-	-	99%	128%	116%	127%	122%	-	-	-	-	-	-	-
Spike	23-25/05/2023																

		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	*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	*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	MW117	<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	19
laboratory	WDUP1	<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	18
duplicate	MEAN	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	0.75	nc	nc	1	18.5
	RPD %	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	67%	nc	nc	0%	5%
Inter	MW116	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	1	<0.1	4	<1	<1	<0.05	2	26
laboratory	WDUP2	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	1	<0.1	4	<1	<1	<0.05	2	27
duplicate	MEAN	nc	nc	nc	nc	nc	nc	nc	nc	1	nc	4	nc	nc	nc	2	26.5
	RPD %	nc	nc	nc	nc	nc	nc	nc	nc	0%	nc	0%	nc	nc	nc	0%	4%
Field	TB-W1	<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
Blank	23-25/05/2023																
Trip	TS-W1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Spike	23-25/05/2023																

Result outside of QA/QC acceptance criteria — Value

Appendix C: Pre-Remediation (Data Gap) Location Coordinates

JKE Project E35521PT Blayney

Location	Easting	Northing	GDA94, Zone 55
TP301	708921.7939	6286815.408	
TP302	708933.3509	6286823.559	
TP303	708935.054	6286833.413	
TP304	708943.2048	6286821.856	
TP305	708969.7251	6286857.865	
TP306	708968.022	6286848.011	
TP307	708977.8759	6286846.308	
TP308	708976.1728	6286836.454	
TP309	708974.4697	6286826.6	
TP310	708972.7665	6286816.746	
TP311	708971.0634	6286806.892	
TP312	708969.3603	6286797.038	
TP313	708986.0267	6286834.751	
TP314	708984.3236	6286824.897	
TP315	708982.6205	6286815.043	
TP316	708980.9173	6286805.189	
TP317	708979.2142	6286795.335	
TP318	708989.4329	6286854.459	
TP319	709000.9899	6286862.61	
TP320	709010.8438	6286860.906	
TP321	708999.2868	6286852.756	
TP322	709009.1407	6286851.053	
TP323	708997.5837	6286842.902	
TP324	708995.8806	6286833.048	
YP325	708994.1775	6286823.194	
TP326	708992.4744	6286813.34	
TP327	708990.7713	6286803.486	
TP328	708989.0681	6286793.632	
TP329	709005.7345	6286831.345	
TP330	709004.0314	6286821.491	
TP331	709002.3283	6286811.637	
TP332	709000.6252	6286801.783	
TP333	708998.9221	6286791.929	
TP334	709015.5884	6286829.642	
TP335	709013.8853	6286819.788	
TP336	709012.1822	6286809.934	
TP337	709010.4818	6286800.096	
TP338	709008.776	6286790.226	
TP339	709025.4423	6286827.939	
TP340	709023.7392	6286818.085	
TP341	709022.0361	6286808.231	
TP342	709033.5931	6286816.382	

Appendix D: Imported Materials and Waste Tracking Registers

Imported Materials Register

Supplier	Date	Docket/Invoice #	Product Type	Quantity (specify m3 or tonnes)	Area where Material was Placed

Exported (Waste) Materials Register

Load	Date	Material Type / Classification	Site Area where Waste was Generated	Waste Classification Report Reference	Disposal Facility	Tipping Receipt/Docket Number	Tracking Number (where relevant)	Tonnage

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)[27] methods and those described in *Environmental Sampling and Analysis, A Practical Guide,* (1991)[28]. 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;

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

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

- All blank data reported;
- 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:

$$\frac{\text{(D1 – D2) x 100}}{\{(D1 + D2)/2\}}$$

Appendix F: Guidelines and Reference Documents

Acid Sulfate Soils Management Advisory Committee (ASSMAC), (1998). Acid Sulfate Soils Manual

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)

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)

Western Australia Department of Health, (2021). Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia