REPORT TO

HEALTH INFRASTRUCTURE C/-CBRE

ON

REMEDIATION ACTION PLAN

FOR

PROPOSED NEPEAN HOSPITAL STAGE 2 DEVELOPMENT

AT

NEPEAN HOSPITAL, DERBY STREET, KINGSWOOD, NSW

Date: 14 December 2021
Ref: E34236PLrpt4-RAP

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Executive Summary

Health Infrastructure ('the client') commissioned JK Environments (JKE) to prepare a Remediation Action Plan (RAP) for the proposed Stage 2 development at Nepean Hospital, Derby Street, Kingswood, NSW. The site location is shown on Figure 1 and the investigation was confined to the Stage 2 development boundaries (referred to herein as 'the site') as shown on Figure 2 attached in Appendix A.

This RAP has been prepared to support the lodgement of a State Significant Development Application (SSDA) for the proposed development, with regards to State Environmental Planning Policy No.55 – Remediation of Land (1998)[1], as required by the Planning Secretary's Environmental Assessment Requirements (SEARs).

JKE has previously undertaken a Preliminary Site Investigation (PSI) at the site, which included a detailed review of previous investigations that occurred across the wider Nepean Hospital campus for various historical and more recent developments. A Detailed Site Investigation (DSI) was also undertaken to address the recommendations of the PSI. A summary of this information is included in Section 2.

Investigations at the site have identified the occurrence of asbestos in fill and at the ground surface. An underground storage tank (UST) is also suspected to exist. Asbestos exceeded the nominated site assessment criteria (SAC) at three locations as a result of the asbestos either occurring at the surface, within the top 100mm of soil, or at a concentration that exceeded the health-based SAC.

The goal of the remediation is to render the site suitable for the proposed development from a contamination viewpoint. The primary aim of the remediation at the site is to reduce the human health risks posed by site contamination to an acceptable level. The objectives of the RAP are to:

- Provide a framework to address the data gaps;
- Provide a methodology to remediate and validate the site based on the risks identified during the DSI;
- Outline site management procedures to be implemented during remediation work; and
- Provide a contingency plan for the remediation works, including an unexpected finds protocol and other relevant contingencies relating to remediation and validation.

The proposed (and preferred) remediation strategy for asbestos is excavation and off-site disposal. A data gap investigation is required following demolition and the outcome of that investigation is to be used to confirm the extent of remediation and the preferred strategy/strategies.

This RAP includes contingencies for remediating and validating the UST, should this be discovered during the demolition works. Contingencies for capping asbestos contaminated soil, whether in-situ, or within a borrow pit/containment cell, are also included.

The requirements for data gap investigation and additional reporting, including preparation of a revised or addendum RAP, must be appropriately factored into the project timelines. The anticipated sequence of remediation works is outlined at the beginning of Section 5 of this RAP. Remediation will occur concurrently with the development works as demolition must occur to enable the requirements under this RAP to be implemented. The client must engage with the consent authority so that the conditions in the development approval/consent align with the sequence of works and requirements of the RAP.

JKE is of the opinion that the site can be made suitable for the proposed development via remediation and the implementation of this RAP. A site validation report is to be prepared on completion of remediation activities and submitted to the planning/consent authority to demonstrate that the site is suitable for the proposed development following completion of remediation/validation. In the event that any of the capping contingencies are implemented, a Long-Term Environmental Management plan (LTEMP) will also be prepared to manage the contaminated material. The LTEMP will provide a passive management approach and is not expected to impose any onerous constraints on the day-to-day site use under the proposed development scenario.

[1] *State Environmental Planning Policy No. 55 – Remediation of Land 1998* (NSW) (referred to as SEPP55)

As the proposed development is to be approved via a SSDA, JKE has assessed that the remediation falls within Category 1 under SEPP55 (based on Clause 9[d]). However, this should be confirmed by the client's expert planner. Category 1 requires development consent.

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

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Attachments

Abbreviations

Asbestos Fines/Fibrous Asbestos	**AF/FA**
Added Contaminant Limits	**ACL**
Asbestos Containing Material	**ACM**
Australian Height Datum	**AHD**
Acid Sulfate Soil	**ASS**
Asbestos Management Plan	**AMP**
Below Ground Level	**BGL**
Benzene, Toluene, Ethylbenzene, Xylene	**BTEX**
Benzene, Toluene, Ethylbenzene, Xylene, Naphthalene	**BTEXN**
Contaminated Land Management	**CLM**
Contaminant(s) of Potential Concern	**CoPC**
Chain of Custody	**COC**
Conceptual Site Model	**CSM**
Dial Before You Dig	**DBYD**
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JK Environments	**JKE**
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State Significant Development Application	**SSDA**
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Upper Confidence Limit	**UCL**

United States Environmental Protection Agency	**USEPA**
Validation Assessment Criteria	**VAC**
Virgin Excavated Natural Material	**VENM**
Work Health and Safety	**WHS**

Units

Metres BGL	**mBGL**
Metres	**m**
Millilitres	**ml or mL**
Milligrams per Kilogram	**mg/kg**
Percentage	**%**
Percentage weight for weight	**%w/w**

1 INTRODUCTION

Health Infrastructure ('the client') commissioned JK Environments (JKE) to prepare a Remediation Action Plan (RAP) for the proposed Stage 2 development at Nepean Hospital, Derby Street, Kingswood, NSW. The site location is shown on Figure 1 and the investigation was confined to the Stage 2 development boundaries (referred to herein as 'the site') as shown on Figure 2 attached in Appendix A.

This RAP has been prepared to support the lodgement of a State Significant Development Application (SSDA) for the proposed development, with regards to State Environmental Planning Policy No.55 – Remediation of Land (1998)[2], as required by the Planning Secretary's Environmental Assessment Requirements (SEARs).

JKE has previously undertaken a Preliminary Site Investigation (PSI) (Ref: E34236PLrpt, dated 12 November 2021)[3] at the site, which included a detailed review of previous investigations that occurred across the wider Nepean Hospital campus for various historical and more recent developments. A Detailed Site Investigation (DSI) (Ref: E34236PLrpt3, dated 19 November 2021)[4] was also undertaken to address the recommendations of the PSI. A summary of this information is included in Section 2.

Widespread contamination has not been identified at the site. However, the extent of investigations has been limited by access constraints associated with the existing buildings, operational considerations for the hospital, and the presence of underground services throughout the site. This RAP provides a strategy to remediate the known contamination (asbestos in soil) identified during the DSI, a framework for data gap investigation that is to occur when the site becomes accessible, and a detailed contingency plan to address unexpected finds and a suspected Underground Storage Tank (UST). This RAP requires preparation of an addendum or updated RAP on completion of the data gap investigation.

1.1 Proposed Development Details

Based on the details provided, JKE understand that the proposed development includes:

- Substantial demolition works throughout North Block;
- Demolition of the Doctor's Accommodation, Hope Cottage and Pathology buildings;
- Alterations and additions to the remaining buildings and structures;
- Roadworks and landscaping in external areas and along Barber Avenue; and
- Construction of the main Stage 2 building which will link the Stage 1 tower building.

Details of cut/fill earthworks have not been provided at this stage. However, it is anticipated that excavations will be required for the main Stage 2 building, footings and underground services. Some filling is also expected to occur. The majority of the roadways/driveways and landscaped areas are anticipated to be completed close to the existing grade.

[2] *State Environmental Planning Policy No. 55 – Remediation of Land 1998* (NSW) (referred to as SEPP55)

[3] JKE (2021a) *Report to Health Infrastructure on Preliminary Site Investigation (PSI) for Proposed Nepean Hospital Stage 2 Development at Nepean Hospital, Derby Street, Kingswood, NSW*. (referred to as the PSI)

[4] JKE (2021b) *Report to Health Infrastructure on Detailed Site Investigation (DSI) for Proposed Nepean Hospital Stage 2 Development at Nepean Hospital, Derby Street, Kingswood, NSW*. (referred to as the DSI)

1.2 Remediation Goal, Aims and Objectives

The goal of the remediation is to render the site suitable for the proposed development from a contamination viewpoint. The primary aim of the remediation at the site is to reduce the human health risks posed by site contamination to an acceptable level.

The objectives of the RAP are to:

- Provide a framework to address the data gaps;
- Provide a methodology to remediate and validate the site based on the risks identified during the DSI;
- Outline site management procedures to be implemented during remediation work; and
- Provide a contingency plan for the remediation works, including an unexpected finds protocol and other relevant contingencies relating to remediation and validation.

1.3 Scope of Work

The RAP was prepared generally in accordance with a JKE variation proposal (Ref: EP54363PL.Var1) of 25 November 2021 and written acceptance from the client via email of 25 November 2021. The scope of work included a review of previous reports, review of the Conceptual Site Model (CSM), review of the proposed development details and preparation of the RAP.

The RAP was prepared with reference to the National Environmental Protection (Assessment of Site Contamination) Measure 1999 as amended (2013)[5], SEPP55 and other guidelines made under or with regards to the Contaminated Land Management Act (1997)[6], including the Consultants Reporting on Contaminated Land (2020)[7] guidelines.

A list of reference documents/guidelines is included in the appendices.

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

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

[7] NSW EPA, (2020). *Consultants reporting on contaminated land, Contaminated Land Guidelines.* (referred to as Consultants Reporting Guidelines)

2 SITE INFORMATION

2.1 Summary of PSI and DSI

The PSI report included a review of site information, including background and site history information, and a site walkover inspection.

Historical reports were reviewed for the PSI, including several investigations conducted by JKE (and Environmental Investigation Services (EIS), prior to EIS re-branding to JKE) and Golder across the wider Nepean Hospital campus for various historical and recent developments. Reference should be made to the PSI report for a detailed review of the previous reports.

The previous investigations indicated that the site has historically been vacant or used for grazing/agricultural purposes, prior to it being developed as part of the wider hospital campus. The historical storage of flammable liquids (notably xylene), USTs within the Stage 2 site area and 'off-site' areas within the wider hospital campus, and detectable concentrations of xylene within groundwater were identified during the Golder investigations. Previous investigations did not identify significant, widespread contamination in soil or groundwater. However, asbestos has been found in fill and at the ground surface, both within the Stage 2 site area and within the wider hospital.

Based on the scope of work undertaken for the PSI, JKE identified the following potential contamination sources/AEC:

- Fill material;
- Historical agricultural use;
- Use of pesticides;
- Suspected UST and flammable liquids store;
- Hazardous building materials; and
- Off-site sources, including USTs (within the wider hospital campus).

The PSI concluded that there was a potential for site contamination. Most notably, the PSI indicated that the potential source(s) of the hydrocarbons in groundwater had not been confirmed and there was uncertainty around the contamination status of the fill, particularly with regards to asbestos. A DSI was recommended to establish whether remediation is necessary.

The DSI included soil sampling of the soil from 27 borehole locations and groundwater from four monitoring wells. The DSI sample locations and notable site features are shown on Figure 2 in Appendix A. Asbestos in the form of asbestos fines/fibrous asbestos (AF/FA) was detected in fill soil at a concentration above the adopted human health-based site assessment criteria (SAC) at one location (JKE19). Bonded asbestos containing material (ACM) in the form of fibre cement fragments (FCF) was encountered at the surface and in the top 0.1m of fill soil at two locations (FCF1 and JKE8 respectively), which was also deemed to be an exceedance of the human health-based SAC. The DSI sample locations and SAC exceedances are shown on Figure 3 in Appendix A, and a copy of the borehole logs and laboratory data summary tables is attached in Appendix C.

It is also noted that FCF were found during the DSI that did not contain asbestos.

JKE considered the sources of asbestos contamination were likely to be from historically imported fill material and/or remnants from historical demolition activities.

Elevations of heavy metals in groundwater were identified above the ecological SAC, however these were considered to be consistent with regional/background groundwater conditions. Overall, risks associated with groundwater contamination were assessed to be low.

The DSI report identified several data gaps including the following: the sampling density for asbestos in soil was not met; no sampling was undertaken in most of the existing building footprints; and the presence of the UST was not confirmed and there was considered to be a potential for localised contamination in the vicinity of this infrastructure.

Based on the findings of the DSI report, JKE recommended that a RAP be prepared for the site to outline remediation measures to manage the potential risks from exposure to asbestos to human receptors at the site and to address the data gaps. The DSI report also recommended that interim management of asbestos be undertaken.

2.2 Site Identification

Table 2-1: Site Identification

Site Owner:	Health Infrastructure NSW
Site Address:	Derby Street, Kingswood, NSW
Lot & Deposited Plan:	Part of Lot 4 in DP1238301
Current Land Use:	Hospital
Proposed Land Use:	Hospital
Local Government Authority:	Penrith City Council
Current Zoning:	SP2: Infrastructure
RL (AHD in m) (approx.):	~53-55
Site Area (m^2 approximately):	28,000m^2 (2.8ha)
Geographical Location in decimal degrees (centre point approx.):	Latitude: -33.758899 Longitude: 150.7136
Site Location Plan:	Figure 1
Sample Location and Notable Features Plan:	Figure 2
SAC Exceedance Plan:	Figure 3

2.3 Site Location, Topography and Regional Setting

The site is located within the grounds of the wider Nepean Hospital campus and is bound by The Nepean Private Hospital to the north and Parker Street to the west. The site is located approximately 600m to the north-west of a small tributary to Werrington Creek.

The regional topography is gently undulating characterised by a local ridgeline that runs on a north-south orientation, roughly along Parker Street and the Northern Road. The site itself consists of gentle undulating land with a general slope down to the east at a gradient of approximately 2-3°. Large portions of the site have been levelled for the existing hospital buildings and surrounding development.

2.4 Summary of Site Inspections

Walkover site inspections were undertaken for the PSI and DSI. In summary:

- At the time of the inspections, the majority of the site was occupied by Nepean Hospital buildings and infrastructure. Structures on site include five adjoining buildings of brick, steel, cement and concrete rendered construction with metal roofing. Site buildings were of varying construction age, with some noted to be from circa 1960s/1970s. Based on the age of the site buildings, it was considered likely that hazardous building materials including asbestos are present in the building fabric. Reference is to be made to the JKE hazardous building materials report (Ref: E34236PLrpt2-HAZ, dated 5 November 2021)[8] for further information;
- External site areas were mostly concrete or asphalt/bitumen paved and used for vehicle parking and internal access. However, localised garden beds and landscaped areas occur throughout the site, notably in the north-eastern areas and adjoining the access roads that form the western areas of the site, accessed from Parker Street. The boundaries of the site were generally not clearly defined by fences or cadastral boundaries as the site was nominated to encompass the proposed Stage 2 development area;
- The storage of chemicals (other than very small quantities of cleaning products) was not observed at the time of the inspection, although it is noted that the internal areas of buildings were generally not accessible. A flammable liquids store was located in the central west portion of the site (see Figure 2). Previous reports identified a historical diesel UST in the south-western area of the site (see Figure 2) however, we were not able to identify any conclusive indicators of the UST during our inspection;
- Two FCF were identified on the ground surface during the site walkover in the north-east corner of the site. The FCF were sampled and were analysed for asbestos (FCF1 was ACM as documented in the DSI, whilst FCF2 did not contain asbestos). No other visible or olfactory indicators of contamination were identified at the time of the inspection;
- Sensitive environments such as wetlands, ponds, creeks or extensive areas of natural vegetation were not identified on site or in the immediate surrounds; and
- The surrounding land uses included primarily other areas of the wider hospital campus.

[8] JKE (2021) *Report to Health Infrastructure C/-CBRE on Hazardous Building Materials Survey for Proposed Nepean Hospital Stage 2 Development at Nepean Hospital, Derby Street, Kingswood, NSW*. (referred to as the HAZMAT report)

2.5 Underground Services

The 'Dial Before You Dig' (DBYD) plans were reviewed for the PSI/DSI in order to establish whether any major underground services exist at the site or in the immediate vicinity that could act as a preferential pathway for contamination migration. Local service plans were also supplied by the client. The site contains numerous underground services associated with the hospital, not all of which are shown on the DBYD. There is a potential for underground service trenches to act as preferential contaminant migration pathways. However, this would need to be further assessed depending on the nature, extent and contaminant fate and transport properties of any identified contaminants.

2.6 Summary of Geology, Soils and Hydrogeology

2.6.1 Regional Geology

Regional geological maps reviewed for previous investigations indicated that the site is underlain by Bringelly Shale of the Wianamatta Group, which typically consists of shale, carbonaceous claystone, claystone, laminite, fine to medium grained lithic sandstone, rare coal and tuff.

Investigations have identified a fill layer with depths generally ranging from approximately 0.5m below ground level (BGL) to 1.5mBGL, with some localised deeper fill to 2mBGL. The fill is underlain by natural (residual silty clay soil) to depths of around 2-3mBGL, then claystone/siltstone bedrock.

2.6.2 Acid Sulfate Soil (ASS) Risk and Salinity

The site is not located in an acid sulfate soils (ASS) risk area according to the risk maps prepared by the Department of Land and Water Conservation. The site is not located in an ASS risk are according to the local council planning maps.

Information reviewed for the previous investigations indicated that the site is located within an area of moderate salinity potential.

2.6.3 Hydrogeology

Searches of registered groundwater bore records were undertaken during previous investigations and there were no nearby registered groundwater users (i.e. within approximately 1,000m of the site).

Considering the local topography, surrounding land features and information presented in previous reports, JKE anticipate groundwater to flow towards the north or north-east. This was confirmed via the groundwater contour modelling presented in the previous EIS/JKE reports. Groundwater has typically been found at depths of 2-4mBGL, within the natural soil or bedrock.

2.6.4 Receiving Water Bodies

Surface water bodies were not identified in the immediate vicinity of the site. The closest surface water body is the tributary to Werrington Creek located approximately 600m to the south-east of the site. This is cross-gradient from site and is not likely to be a potential receptor.

3 REVIEW OF CONCEPTUAL SITE MODEL

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 a review of information and the results from the PSI/DSI. Reference should also be made to the figures attached in the appendices.

3.1 Summary of Contamination (Site Characterisation)

Contamination-related risks at the site are associated with asbestos impacts from imported fill material and/or historical demolition works. The DSI identified fill in all borehole locations, to depths ranging from approximately 0.1mBGL to 2.0mBGL. The fill typically comprised silty sandy gravel, silty clay, silty gravelly sand or silty clayey sand with inclusions of igneous gravels, sandstone gravels, siltstone gravels, ash, slag and building rubble (timber, bricks, concrete, glass, plastic, tile fragments).

3.1.1 Actual Contamination

Asbestos in the form of AF/FA was encountered above the human-health based SAC in one fill sample from JKE19 (0-0.1m).

ACM in the form of bonded/non-friable FCF was found at the ground surface at one location (FCF1) during the DSI. ACM (>7mm diameter) was also encountered in the soil sample from JKE8 (0-0.1m) during the DSI bulk asbestos field screening.

The distribution of asbestos is likely to be sporadic and asbestos could be present across parts or all of the site. The potential for generating airborne asbestos fibres and a complete SPR linkage will increase during disturbance of soil containing AF/FA (i.e. during the proposed development works at the site). These risks will need to be managed during construction so they remain low and acceptable. Further sampling will be required to better define the nature and extent of asbestos contamination at the site. It is possible that the occurrence of AF/FA is associated with the ACM. However, it is noted that FA was identified previously in the nearby multi-storey car park development, so the occurrence of friable sources of asbestos cannot be ruled out until the site is fully characterised.

3.1.2 Potential Contamination

Potential contamination may exist beneath the buildings (where investigation has generally not occurred due to access limitations) and in the vicinity of the suspected UST.

JKE note that there were detections of AF/FA in two other borehole locations JKE4 (0-0.1m) and JKE9 (0-0.1m), at concentrations below the SAC. Further investigation in these areas is necessary to establish whether contamination exists that warrants remediation.

3.2 Review of CSM

The table below includes a review of the CSM and this CSM has been used to design the remediation strategy. The CSM will require further review as additional site data becomes available.

Table 3-1: CSM Review

Contaminant source(s) and contaminants of concern	The source of the asbestos contamination is the fill material and/or remnants from historical building demolition. The asbestos impact is considered to be limited to fill soil. The primary contaminant of concern from a remediation standpoint is asbestos primarily in the form of ACM, but also as AF/FA at location JKE19. The presence of the UST has not been confirmed and the UST is therefore a potential source of contamination. The contaminants of potential concern (CoPC) associated with the soil in the immediate vicinity of the UST include TRH/BTEX and PAH compound naphthalene. The CoPC which were not adequately assessed beneath the buildings 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.
Affected media	Soil/fill has been identified as the affected medium for remediation. It is noted that asbestos fibres can mobilise to air.
Receptor identification	Human receptors include site occupants/users (including primarily adults in a commercial land use scenario), construction workers and intrusive maintenance workers. Off-site human receptors include adjacent land users, primarily in a commercial and residential land use scenario. Use of the site by children will occur, however is expected to be infrequent and of short duration.
Exposure pathways	The exposure pathway for asbestos includes inhalation of airborne asbestos fibres. Potential exposure pathways for the CoPC relevant to human receptors include ingestion, dermal absorption and inhalation of dust (all contaminants) and vapours (volatile TRH, naphthalene and BTEX).
Evaluation of data gaps	Additional data is required following demolition to better inform the remediation and attempt to delineate and characterise the nature and extent of contamination. These requirements are outlined in Section 5.4.

3.3 Remediation Extent

Based on the available dataset, remediation of fill containing asbestos will be required in the vicinity of FCF1, JKE8 and JKE19 as shown on Figure 3. The vertical extent of remediation will be to the full depth of the fill at these locations. The horizontal extent will be confirmed during the data gap investigations and via the validation process.

The data gap investigation and implementation of the unexpected finds procedures will be used to establish whether there are any other areas to be remediated.

4 REMEDIATION OPTIONS

4.1 Soil Remediation

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 Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2021)[9] require consideration of the following in assessing remediation options:

1. Minimisation of public risk;
2. Minimisation of contaminated soil disturbance; and
3. Minimisation of contaminated material/soil moved to landfill, including minimisation of risks associated with transportation.

The NSW EPA Contaminated Land Management Guidelines for the NSW Site Auditor Scheme (3rd Edition) (2017)[10] 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.

[9] 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)

[10] NSW EPA, (2017). *Contaminated land Management, Guidelines for the NSW Site Auditor Scheme (3rd ed.).* (referred to as Site Auditor Guidelines 2017)

4.2 Remediation Options Assessment

The table below discusses and assesses a range of remediation options:

Table 4-1: Consideration of Remediation Options

Option	Discussion	Assessment/Applicability
Option 1 **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, thermal desorption and physical removal of bonded ACM fragments. Depending on the treatment option, licences 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.	Treatment of soil by picking/removal of fragments of bonded ACM may be possible. However, an appropriate level of treatment may be difficult to achieve when ACM is present in cohesive/clay soils. Treatment of ACM often requires substantial time and space, and in JKE's experience a cost benefit of treatment over other options such as disposal is difficult to achieve. Treatment is not appropriate for AF/FA.
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 applicable. This option does not align with asbestos remediation hierarchy. This option would also rank low in terms of sustainability due to the increased carbon footprint associated with excavation, transport (both from and back to the site) and the treatment process. Treatment is not appropriate for AF/FA.
Option 3 **Consolidation and isolation of impacted soil by cap and containment**	This would include the consolidation of contaminated soil within an appropriately designed borrow pit/cell, or capping contaminated soils in-situ beneath appropriate clean capping materials (such as pavement and/or clean soil) to reduce the potential for future exposure. The capping and/or containment must be appropriate for the specific contaminants of concern. A Long-Term Environmental Management Plan (LTEMP) would be required and an LTEMP 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).	In-situ capping is applicable for the site and for asbestos, in particular in the areas that will require filling or will be covered by hardstand (pavements, building slabs etc). Risks associated with asbestos can be adequately mitigated by eliminating disturbance of the material via physical barriers. This is considered to be the most sustainable option as it eliminates unnecessary excavation and transport of materials and disposal of waste etc.

Option	Discussion	Assessment/Applicability
<u>Option 4</u> 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 (which may be significant) would apply in addition to transport costs.	Excavation and disposal are applicable for localised areas of contaminated soils, or for any areas where excavation of all fill is required to achieve the required development design levels.
<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.	Applicable as described for option 3.

4.3 Rationale for the Preferred Option for Remediation

The preferred option for remediation is Option 4, excavation and off-site disposal. This option is considered appropriate provided that the extent of remediation is limited to localised 'hotspots'. Risks would be limited to the remediation/construction phase of the project and there would be no need to manage risks via a LTEMP if the contaminated materials are removed from the site.

The alternative options for remediation include Option 3/5, in-situ capping (or consolidation and capping within a cell) and long-term management of the capped areas via an LTEMP. This option would be preferred in the event that unacceptable concentrations of asbestos were found to be more widespread than anticipated (i.e. where the extent of excavation/disposal and the associated costs were too excessive).

Option 3/5 aligns with sustainability and safety/risk-based principles by minimising waste disposal to landfill. Technical details regarding the capping requirements and construction of a borrow pit/cell would require substantial input from the remediation contractor and other stakeholders such as arborist (where tree protection zones exist) and engineers. On this basis, this has not been documented as the preferred option in the RAP, but rather as a contingency as outlined in Section 7. Should this contingency be implemented, an addendum RAP or a Remedial Works Plan (RWP) must first be prepared.

5 REMEDIATION DETAILS

The following general sequence of works is anticipated:

- Pre-commencement meeting;
- Site establishment and demolition/removal of structures;
- Inspection, completion of data gap investigation and associated reporting; and
- Remediation and validation.

5.1 Roles and Responsibilities

Table 5-1: Roles and Responsibilities

Role	Responsibility
Client/Developer and Project Manager	The client and CBRE (however, it is acknowledged that the client may transfer the following responsibilities to a Principal Contractor). The client/project manager will appoint a project team for the remediation works and must provide all investigation reports including this RAP to the remediation contractor, consent authority and any other relevant parties involved in the project. The project manager is required to review all relevant 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 relevant 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 appointed (by Principal Contractor). The remediation 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 outlined in this RAP. 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 appointed (by Principal Contractor). The validation consultant[11] provides consulting advice and validation services in relation to the remediation, and prepares the site validation report and other documentation associated with remediation, as required. The validation consultant is required to review any deviation of this RAP or for unexpected finds if and when encountered during the site work. The validation consultant must 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 investigations,

[11] The validation consultant must be a certified practitioner (specialising in site contamination), under one of the NSW EPA endorsed certification schemes

Role	Responsibility
	validation sampling and inspections. The client and project manager will have full access to the validation consultant at all times during the remediation work.

5.2 Pre-commencement

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 8) must be reviewed by project manager and remediation contractor, and appropriate steps are to be taken to ensure the adequate implementation of the plan.

5.3 Site Establishment and Demolition/Removal of Structures

The remediation contractor is to establish on site as required to facilitate the remediation, and associated data gap investigation 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 6 of this report.

The known remediation areas are to be appropriately isolated and disturbance is to be limited to the extent practicable in these areas during demolition, to minimise the potential for cross-contamination.

The validation consultant is to be present to inspect the demolition of structures and removal of pavements in the vicinity of the suspected UST.

Demolition works must be undertaken with regards to the recommendations outlined in the HAZMAT report and must occur in accordance with the relevant codes, standards, guidelines and regulations. All structures and materials are to be removed from the site and clearance certificates are to be provided for the removal of all hazardous materials.

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.

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

5.4 Inspection and Data Gap Investigation

Additional data must be collected following demolition and prior to any further works. The primary objectives of the investigation are to:

- Assess the soil contamination conditions beneath the buildings (i.e. areas not accessible during the DSI);
- Better assess the fill for the potential occurrence of asbestos;
- Attempt to establish the horizontal extent of asbestos remediation and confirm the preferred remedial strategy;
- Confirm the contaminants of concern for validation purposes; and
- Provide an updated waste classification for the fill, if/where required.

Following the demolition works, the validation consultant must carry out a site inspection and then prepare a Sampling, Analysis and Quality Plan (SAQP) for the data gap investigation. It is noted that this process may be staged to align with the project requirements. The investigation is to include the following (as a minimum):

- Sampling from across the site to meet the NEPM 2013/WA DoH 2021 sampling density requirements for sites where asbestos is "known" to exist in soil. It is acknowledged that this might not be practicable/achievable in all areas of the site, however, any deviations to this approach must be discussed between the validation consultant, the client and the other stakeholders, and agreed to;
- Targeted sampling around the know asbestos occurrences (FCF1, JKE8 and JKE19 as shown on Figure 3 in Appendix A) in an attempt to delineate the horizontal extent of remediation in these areas;
- If there is still uncertainty around whether the UST is present, the data gap investigation is to include provisions for completion of a Ground Penetrating Radar (GPR) scan of the area;
- Soil sampling of fill and natural soils, including bulk field screening for asbestos in accordance with NEPM 2013 requirements. This must occur from test pits using an excavator;
- Collection of a surface fill sample from each location, then a sample from each distinct fill profile thereafter (or at least one sample per meter, whichever is greater);
- Collection of one natural soil sample from beneath the fill at each location (test pits are to be terminated approximately 0.5m into the natural soils unless contamination indicators are present);
- Laboratory analysis of an appropriate number of fill samples for the CoPC;
- Laboratory analysis of underlying natural soil/bedrock samples for the CoPC as deemed appropriate;
- Asbestos analysis of any fragments of fibre cement identified during the investigation;
- Toxicity characteristic leachate procedure (TCLP) analysis as required for waste classification purposes in areas where the proposed excavation works for the development will result in waste requiring off-site disposal; and
- Appropriate quality assurance/quality control (QA/QC) analysis in accordance with NEPM 2013 requirements.

A data gap investigation report is to be prepared based on the findings of the investigation. The data gap report must also document the findings of the initial inspection. Where necessary, the RAP must be updated (or an addendum RAP must be prepared) to reflect the findings and the report(s) must be provided to the planning/consent authority where required.

5.5 Remediation of Asbestos Contamination

The proposed remediation and validation steps for excavation of fill containing asbestos concentrations above the SAC are outlined in the following table. Reference is to be made to Section 6 for the detailed validation plan.

Table 5-2: Remediation – Excavation/Fill Removal

Step	Primary Role/ Responsibility	Procedure
1.	Remediation contractor	Site Management and Geotechnical/Stability: The remediation contractor is to take steps to ensure the site management plan in the RAP and the AMP are implemented for the remediation works. The remediation areas are to be appropriately marked out and isolated prior to the commencement of remediation (e.g. using star pickets and tape). The horizontal extent of the remediation will be based on the findings of the data gap investigation. Geotechnical advice must be sought regarding the stability of the adjacent structures and/or adjacent areas prior to commencing remediation (as required). Stability issues should be addressed to the satisfaction of a suitably qualified geotechnical engineer. This may require the installation of additional temporary shoring systems. All underground services are to be appropriately disconnected and/or rerouted to facilitate the works.
2.	Remediation contractor	Excavation and off-site Disposal of Fill: A preliminary waste classification for the fill is provided in the DSI and this is to be updated and finalised in the data gap investigation report. Fill is to be excavated to the required depth, loaded directly into trucks and disposed of to a licensed facility in accordance with the AMP and the assigned waste classification. The waste must be tracked using WasteLocate. Fill is to be excavated down to the top of the natural material (soil or bedrock, whichever is encountered first) and to the horizontal extent of remediation.
3.	Validation Consultant	Validation of remedial excavations: Following excavation, the validation consultant is to obtain validation samples in accordance with the validation plan in Section 6 of this RAP. Any necessary asbestos clearances must also be provided in accordance with the validation plan and the AMP.
4	Remediation contractor Validation Consultant	Backfilling/Reinstatement of Remedial Excavations: Following successful validation, the remedial excavations are to be backfilled using clean (validated) material. Preferably this should include clean, site-won material sourced from areas that are not contaminated. Any backfill imported from off-site must be appropriately validated in accordance with Section 6.

5.6 Remediation Documentation

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

- Waste disposal dockets, including waste tracking consignment details;
- Asbestos management documentation, including all relevant notifications and monitoring reports, and clearance certificates (additional details in this regard are to be outlined in the AMP);
- Photographs of remediation works;
- Waste tracking documentation (see below and the example waste tracking form in Appendix C);
- Imported materials documentation (see below and the example imported material tracking form in Appendix C).

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

5.6.1 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 construction contractor/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); 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. Reports are to include:

- The full name, address, Australian Company Number (ACN) or Australian Business Number (ABN) of the organisation and person(s) providing the waste classification;
- Location of the site where the waste was generated, including the source site address;
- History of the material and the processes and activities that have taken place to produce the waste;
- Potential contaminating activities that may have occurred at the site where the waste was generated;
- Description of the waste, including photographs, visible signs of contamination, such as discolouration, staining, odours, etc;
- Quantity of the waste;
- Number of samples collected and analysed;
- Sampling method including pattern, depth, locations, sampling devices, procedures, and photos of the sample locations and samples;
- Contaminants tested;
- Laboratory documentation – chain-of-custody (COC), sample receipt, laboratory report;

- All results regardless of whether they are not used in the classification process;
- Results of sample mean, sample standard deviation and the 95% upper confidence limit (UCL) where relevant;
- Brief summary of findings including discussion of results; and
- A clear statement of the classification of the waste as at the time of the report.

A review of the disposal facility's Environment Protection Licence (EPL) issued under the Protection of the Environment Operations (POEO) Act (1997)[12] 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.

5.6.2 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 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.

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

6 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 6.1. This is the minimum requirement based on the remedial strategies provided. Additional validation sampling may be required based on the outcome of the data gap investigation and/or observations made during remediation.

6.1 Validation Sampling and Documentation

6.1.1 Asbestos Remediation Validation Requirements

Validation sampling from the asbestos remedial excavations is to occur at the following rates:

- One per 5m lineal along the excavation walls, with a minimum of one sample per fill profile (or at least one sample per vertical metre, whichever is greater). For walls that are less than 5m in length, a minimum of one location must be sampled per wall; and
- One sample per 25m^2 (5m by 5m grid) across the excavation base. For excavation areas less than 25m^2, a minimum of one location must be sampled.

For remedial excavations impacted by ACM (only), validation sampling must include bulk field screening for asbestos. Any identified FCF in the bulk samples must be analysed for asbestos. Bulk sampling of the natural soils at the base of the remedial excavation is not required in this instance.

For remedial excavations impacted by AF/FA or a combination of AF/FA and ACM, validation sampling will include collection of 500ml soil samples for asbestos analysis using the NEPM 2013 methodology.

The validation consultant/LAA must also undertake an asbestos clearance and provide an asbestos clearance certificate for each asbestos remediation area.

6.1.2 Imported Materials

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

Table 6-1: Validation Requirements

Aspect	Sampling	Analysis	Observations and Documentation
Imported Materials – validation of imported materials is required for any materials imported onto the site during the site establishment, remediation and to the point in time that the site validation report is prepared (e.g. general fill to raise the site levels, imported materials to create piling platform, gravels for site preparation, material used for capping layers etc).			
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	**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

Aspect	Sampling	Analysis	Observations and Documentation
		asbestos (500ml). Additional analysis may be required depending on the site history of the source property.	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).
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 Environment Protection Licence (EPL), where relevant. 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.

Aspect	Sampling	Analysis	Observations and Documentation
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: - 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/topsoil and mulches	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 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.

Aspect	Sampling	Analysis	Observations and 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.

6.2 Validation Assessment Criteria and Data Assessment

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

Table 6-2: Validation Assessment Criteria (VAC)

Validation Aspect	VAC
Asbestos remedial excavations	Asbestos as ACM concentrations <0.05%w/w and AF/FA concentrations <0.001%w/w based on the NEPM (2013) commercial/industrial land use criteria. Confirmation of natural soil or bedrock at the base. No visible FCF/ACM observed on the exposed walls and base, as demonstrated by an asbestos clearance inspection/certificate.
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 URPOS exposure setting presented in Schedule B1 of the NEPM 2013, except for lead which should be less than 163mg/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 Sydney area. The concentration of 163mg/kg was sought from the Ambient Background Concentrations (ABC) presented in the document titled Trace Element Concentrations in Soils from Rural and Urban Areas of Australia (1995)[13].

[13] 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

Validation Aspect	VAC
	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. Aesthetics: all imported materials are to be free of staining and odours.

Laboratory data is to be assessed as above or below the VAC. Statistical analysis is not proposed.

6.3 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.

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.

6.3.1 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.

6.3.2 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:

- Was the data gap investigation completed and were the relevant reports prepared prior to commencement of the remediation?
- Was the remediation undertaken in accordance with the RAP?
- 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?

- Is the site suitable for the proposed development from a contamination viewpoint?

6.3.3 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, waste and imported materials registers;
- Validation sampling and laboratory analysis results for remedial excavations and imported materials;
- Laboratory analysis of soils; and
- Field and laboratory QA/QC data.

6.3.4 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 and will be limited vertically to the depth of fill in the defined remediation areas. The vertical study boundary may be increased if the UST is encountered or in the event that deeper contamination is identified as a result of an unexpected find.

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

6.3.5.1 VAC

The validation data will be assessed in accordance with the requirements outlined in Section 6.1 and 6.2.

6.3.5.2 Field and Laboratory QA/QC

Field QA/QC for validation is required for waste classification assessment and for imported materials validation. 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), analysed for the same analytical suite as the primary samples excluding asbestos;
- Trip spike samples (one per batch), analysed for BTEX, only where samples within that batch have been scheduled for analysis of TRH or BTEX; 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.

6.3.5.3 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.

6.3.6 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.

6.3.7 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.

The proposed sampling plan for the validation is described in Section 6.1.

6.4 Validation Report

As part of the site validation process, a validation report will be prepared by the validation consultant. The report will present the results of the validation assessment 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 addendum or revision of the RAP.

In the event that the contingencies involving capping contaminated soils on-site are implemented, a LTEMP will be required to manage the contamination that is to be capped at the site and the LTEMP will be documented as part of the overall validation process. Public notification and enforcement mechanisms for the LTEMP are to be arranged by the client and Penrith City Council is to be provided with a draft copy of the LTEMP for consultation prior to finalisation of the LTEMP. The notification and enforcement mechanisms are likely 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 LTEMP would include requirements for passive management of the capping system that will focus on maintaining the cap over areas of contaminated soil, to minimise the potential of. The LTEMP will also include contingencies for managing intrusive works in the event that the capping system is breached.

7 CONTINGENCY PLAN

The contingency plan for contamination-related aspects of the project and site remediation is provided in the following sub-sections:

7.1 Identification of UST

If encountered, the UST and associated infrastructure (i.e. underground pipe work, vent pipes etc) are to be removed from the site in accordance with the Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation (2019)[14], Guidelines for the Implementation of the Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2019 (2020)[15] and the Australian Standard for The Removal and Disposal of Underground Petroleum Storage Tanks (AS4976-2008)[16]. Reference is also to be made to the UPSS Technical Note: Decommissioning, Abandonment and Removal of UPSS (2010)[17] and the UPSS Technical Note: Site Validation Reporting (2010)[18].

The remediation is to occur in accordance with the current regulation and best practice guidelines available when the remediation commences.

Table 7-1: Contingency Remediation – UST and 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). This may require the installation of temporary shoring. All underground services are to be appropriately disconnected or rerouted to facilitate the works.
2.	Remediation contractor (or their nominated sub-contractor)	Initial Preparation: 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 UST. Liquid and/or sludge within the UST 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.

[14] *Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2019* (NSW). (referred to as UPSS Regulation 2019)

[15] NSW EPA, (2020). *Guidelines for the Implementation of the Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2019.* (referred to as UPSS Guidelines 2020)

[16] Standards Australia, (2008). *The Removal and Disposal of Underground Petroleum Storage Tanks.* (referred to as AS4976-2008)

[17] NSW DECCW, (2010). *UPSS Technical Note: Decommissioning, Abandonment and Removal of UPSS*

[18] NSW DECCW, (2010). *UPSS Technical Note: Site Validation Reporting*

Step	Primary Role/ Responsibility	Procedure
3.	Remediation contractor (or their nominated sub-contractor) and validation consultant	<u>Removal of the UST/infrastructure, impacted soils, followed by validation:</u> 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 UST are to be excavated and stockpiled separately. All stockpiles should be placed on the adjacent hardstand with appropriate silt control. This material is to be validated by the validation consultant for waste classification purposes; • 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; • 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 PID screening results; • Stockpile the excavated material separately to the backfill that was initially excavated and undertake a waste classification as outlined above, then 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 the validation plan (Table 7-2); • Document observations regarding the presence (or otherwise) of groundwater at the base of the tank pit; and • Subject to successful validation, backfill the remedial excavation using imported materials validated in accordance with Section 6, or with clean site-won material. 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.

Table 7-2: Contingency – UST Validation Requirements

Aspect	Sampling	Analysis	Observations and Documentation
UST 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. TCLP analysis as required.	Samples to be screened using PID. Observations of staining and odour to be recorded. Photographs to be taken. Disposal dockets to be retained. Waste classification report to be prepared in accordance with the Consultants Reporting Guidelines and NSW EPA Waste Classification

Aspect	Sampling	Analysis	Observations and Documentation
			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. Additional sampling is also to target obvious indicators of contamination (e.g. odours, staining).	Lead, TRH/BTEX and naphthalene (BTEXN).	Samples to be screened using PID. Observations of staining and odour to be recorded. Photographs to be taken. 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.

The VAC for validating the UST removal must reflect the appropriate Health Investigation Levels (HILs) and Health Screening Levels (HSLs) presented in Schedule B1 of NEPM 2103.

7.2 Unexpected Finds

7.2.1 Asbestos Related

Unexpected asbestos-related finds include the identification of asbestos or suspected asbestos containing material in areas where it has not previously been identified. In the event of an asbestos-related unexpected find, reference is to be made to the AMP.

7.2.2 General 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 odorous or stained hydrocarbon impacted soils, additional underground tanks 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 should 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 consent authority; and
- Contamination should be remediated and validated in accordance with the advice provided, and the results are to be included in the validation report.

7.3 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.

7.4 Validation Failure for Excavation and Off-site Disposal Remediation

Considering the contaminant of concern (i.e. asbestos) and the simplicity of the proposed remediation strategy, the potential for the remediation strategy to fail is considered to be low. In the event of validation failure in the asbestos remedial excavations, additional material can either be 'chased out' and disposed off-site, then the area re-validated. Or alternatively, the area can be considered contaminated with asbestos and remediated via implementation of the capping contingency below (subject to prior stakeholder agreement).

7.5 Capping

7.5.1 Capping In-situ

A conceptual capping specification is provided in the following table. These requirements must be reviewed and discussed by the project team prior to finalising the addendum/revised RAP. The project plans (e.g. landscape plans, design drawings, bulk earthworks plan etc) must be updated include the capping specification details.

Table 7-3: Contingency – In-situ Capping Specification

Area	Capping Specification^
Continuous hardstand (e.g. pavement/concrete, or beneath permanent fixed features such as steps, retaining walls etc.)	Installation of: • Geotextile (or geogrid) marker[19] layer over the contaminated fill; • Clean imported (validated) basecourse, as required based on the engineering specification; and • Pavement material (i.e. concrete) as per engineering specification, or construction of the above ground feature.
Other areas with non-continuous hardstand (e.g. tiled areas, paving/pavers etc.)	Installation of: • Geotextile (or geogrid) marker over the contaminated fill; • At least 200mm clean imported (validated) capping material; and • Surface finish to required development design.

[19] The purpose of the geotextile (or geogrid) marker is to provide visual demarcation to the underlying contaminated fill, should the overlying capping layers be disturbed. The client/project manager, remediation contractor and validation consultant are to agree on appropriate materials based on the project requirements (including but not limited to landscaping and engineering requirements).

Area	Capping Specification^
New planting areas (trees, shrubs, shallow/mass plantings, garden beds etc) and turfed areas This excludes any planting that occurs in planter boxes above pavements	Installation of: • Geotextile (or geogrid) marker layer over the contaminated fill; • At least 500mm clean imported (validated) topsoil/growing medium; and • All plantings to occur within the 500mm clean material (or see below for tree pits). Excavation of a tree pit at least 500mm greater than the outer diameter of the root ball in all directions, and installation of: • Geotextile (or geogrid) marker layer over the contaminated fill. This must be secured to the geotextile/geogrid marker in the area adjoining the tree pit – a 1,000mm overlap (at least) and use of soil 'U' nails to pin down the geotextile would be acceptable. The geotextile/geogrid marker at the base of the tree pit may need to be perforated with small holes to allow root growth (to be confirmed by the project arborist); • Backfill with clean imported (validated) topsoil/growing medium; and • Surface finish as required (e.g. mulch).
Service trenches	New services installed within contaminated fill must be lined with the geotextile (or geogrid) marker at the base and walls and backfilled with clean (validated) material. The marker layer must be overlapped or appropriately fixed the that in the areas adjoining the trench.

^ The capping specification relates to the remediation only and has not considered engineering or landscape design requirements for the site. Engineering and/or landscape design requirements must be assessed by others in the context of the RAP requirements and the validation consultant must be advised if any aspects of the capping are not achievable or require alternative solutions.

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

Table 7-4: Contingency Remediation – In-situ Capping

Step	Primary Role/ Responsibility	Procedure
1.	Remediation contractor	<u>Installation of Marker Layers and Survey of site levels:</u> After the bulk excavation levels are achieved to facilitate the minimum capping requirements, the geotextile (or geogrid) marker is to be installed over the contaminated 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. 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 such as service trenches and tree pits etc). 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.
2.	Validation consultant and remediation contractor	<u>Importation of Capping Materials:</u> Imported materials are to be validated in accordance with Section 6. Validated materials can then be used to achieve the minimum capping requirements for the project.

Step	Primary Role/ Responsibility	Procedure
3.	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. 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.

The table below outlines the validation requirements for the site:

Table 7-5: Contingency – In-situ Capping Validation Requirements

Aspect	Sampling	Analysis	Observations and Documentation
Capping			
Survey of site levels.	NA	NA	**Remediation contractor** to obtain the survey as required in Table 7-4. It is also expected that the remediation contractor or their nominated construction contractor will provide as-built drawings for the project which document the capping layers.
Inspections.	NA	NA	**Validation consultant** to carry out inspections to document the installation of the cap. Key hold points for inspections include: - Geotextile/geogrid installation; - During importation of materials used to construct the cap; and - Finished surface levels. A photographic record is to be maintained by the **remediation contractor** and **validation consultant**.

7.6 Borrow Pit/Capping in Containment Cell

If a borrow pit/containment cell is to be constructed at the site to contain contaminated fill, the following contingency should be implemented.

The validation consultant, working with the remediation contractor, is to prepare a RWP to the satisfaction of the project manager/client. The RWP is to include, as a minimum:

- Survey plans indicating the nominated area for the cell, including survey coordinates for the horizontal extent of the cell;
- Design details including relative levels (RLs) for the base of the cell, top of the asbestos-impacted soil to be placed within it, RLs to the top of the clean soil cap, and details regarding the site features and surface finishes to be constructed over the cell as part of the proposed development which align with the proposed minimum capping requirements outlined previously in this RAP (e.g. pavements etc);

- Consideration of any structural requirements for the development, including but not limited to piling through the cell or suspending structures over the cell;
- Should the borrow pit be likely to intercept groundwater, then additional leachate testing of fill will be required. Limited leachate testing undertaken to date for waste classification purposes has indicated that heavy metals and PAHs are not leaching at significant concentrations;
- Details for the earthworks, including geotechnical requirements (including but not limited to compaction of the cell contents and capping layers, batter requirements, and consideration of root-affected/organic content in root-affected soils to be excavated), locations of access ramps, temporary stockpiling locations for material excavated from the cell area during its construction, and materials management practices to minimise the potential for cross contamination with the remediation areas;
- A process so that some of the virgin excavated material to create the cell is preferably re-used to cap the cell;
- An updated validation plan for this aspect of the works; and
- A contingency plan in the event that additional capacity is required, including the location of secondary cells or areas where the original cell could be expanded.

The borrow pit/containment cell should preferably be placed in an area that will be permanently paved rather than areas of extensive landscaping and/or services.

A quantity surveyor should be engaged to assess the cut/fill requirements of the proposed development to establish the anticipated amount (if any) of fill that will be required to be disposed off-site or be placed in the borrow pit.

7.7 Remediation Strategy Changes

Any material change to the proposed remediation strategy will require revision of the RAP or preparation of an addendum RAP.

8 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.

8.1 Asbestos Management Plan

Prior to the demolition and the removal of the existing pavements/floor slabs, a construction/remediation-phase AMP is to be prepared by the validation consultant (or the remediation contractor, if agreed to by the relevant parties involved) to document the asbestos-related management requirements for the remediation. The AMP is to be implemented by the remediation contractor (and their nominated subcontractors where relevant) throughout the remediation. The AMP must consider that asbestos has been identified as both friable (AF/FA) and non-friable (ACM), based on the definitions of asbestos forms detailed in NEPM 2013 and relevant codes of practice.

8.2 Interim Site Management

Interim management measures should be implemented to manage risks from ACM at the ground surface and in the asbestos impacted area within the internal staff courtyard garden beds (JKE19). This is to include the following measures:

- Ensure the garden beds in the vicinity of JKE19 are suitably covered with mulch over any exposed soils;
- Restrict gardening/maintenance activities in this area until such time as the soil can be remediated and/or the risk of exposure can be eliminated; and
- An interim AMP for the site should be prepared and implemented. The AMP will provide guidance on management of potential ACM at the ground surface and AF/FA at JKE19.

8.3 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 8-1: Project Contacts

Role	Company	Contact Details
Project Manager	CBRE	Contact: Paul Hunter Mobile: 0468 468 454 Email: Paul.Hunter2@cbre.com
Remediation Contractor	To be appointed	-
Validation Consultant	To be appointed	-

Role	Company	Contact Details
Certifier	To be appointed	-
NSW EPA	Pollution Line	131 555
Emergency Services	Ambulance, Police, Fire	000

8.4 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 personal protective equipment (PPE) required for remediation work.

8.5 Timing and Sequencing of Remediation Works

The anticipated sequence of remediation works is outlined at the beginning of Section 5 of this RAP. Remediation will occur concurrently with the development works as demolition must occur to facilitate the implementation of the requirements under this RAP.

The client must engage with the consent authority so that the conditions in the development approval/consent align with the sequence of works and requirements of the RAP.

8.6 Site Soil and Water Management Plan, and on-site Material Tracking Plan

The remediation contractor should prepare a detailed soil and water management plan prior to the commencement of site works and this should 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/consent authority. Reference should be made to the consent conditions 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.

A Material Tracking Plan (MTP) is to be prepared by the validation consultant, in consultation with the remediation contractor (or vice versa). The primary objective of the MTP is to document a procedure for the on-site management and movement of materials, to reduce the potential for cross-contamination. The MTP must include details and procedures regarding the following:

- Documentation requirements for the contractors and the form of such documentation (i.e. searchable excel files, hard copy inspection/check forms etc), including an example material tracking register relevant to on-site movement of materials;

- Identification of hold points and approval requirements for movement of materials, and the documentation that must be completed to track the material movement from source area to destination;
- Implementation of a grid system across the site for the purpose of describing the movement of materials;
- Stockpile management, including signage/storage requirements for clean and contaminated stockpiles, imported materials etc. This must include specific requirements for materials handling during the borrow pit works, should this contingency be implemented; and
- Details of how cross-contamination of clean/capped areas will be prevented.

8.7 Noise and Vibration Control Plan

The guidelines for minimisation of noise on construction sites outlined in AS-2460 (2002)[20] 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 consent authority (refer to consent documents).

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.

8.8 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;

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

- 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.

8.9 Dewatering

Temporary dewatering is not anticipated to be required as part of the 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.

8.10 Air Monitoring

Air monitoring details must be outlined as part of the AMP to be prepared for the site. 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.

8.11 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.

8.12 WHS Plan

A site specific WHS plan should 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.

8.13 Waste Management

Prior to commencement of remedial works and excavation for the proposed development, the remediation contractor should develop a waste management or recycling plan to minimise the amount of waste produced from the site.

8.14 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.

8.15 Hours of Operation

Hours of operation should be between those approved by the planning/consent authority under the development approval process.

8.16 Community Consultation and Complaints

The remediation contractor should provide details for managing community consultation and complaints within their Construction Plans.

9 CONCLUSION

Investigations at the site have identified the occurrence of asbestos in fill and at the ground surface. A UST is also suspected to exist. Asbestos exceeded the nominated SAC at three locations as a result of the asbestos either occurring at the surface, within the top 100mm of soil, or at a concentration that exceeded the health-based SAC.

The proposed remediation strategy for asbestos is excavation and off-site disposal. A data gap investigation is required following demolition and the outcome of that investigation is to be used to confirm the extent of remediation and the preferred strategy/strategies.

This RAP includes contingencies for remediating and validating the UST, should this be discovered during the demolition works. Contingencies for capping asbestos contaminated soil, wither in-situ, or within a borrow pit/containment cell, are also included.

The requirements for data gap investigation and additional reporting, including preparation of a revised or addendum RAP, must be appropriately factored into the project timelines. The anticipated sequence of remediation works is outlined at the beginning of Section 5 of this RAP. Remediation will occur concurrently with the development works as demolition must occur to enable the requirements under this RAP to be implemented. The client must engage with the consent authority so that the conditions in the development approval/consent align with the sequence of works and requirements of the RAP.

JKE is of the opinion that the site can be made suitable for the proposed development via remediation and the implementation of this RAP. A site validation report is to be prepared on completion of remediation activities and submitted to the planning/consent authority to demonstrate that the site is suitable for the proposed development following completion of remediation/validation. In the event that any of the capping contingencies are implemented, a LTEMP will also be prepared to manage the contaminated material. The LTEMP will provide a passive management approach and is not expected to impose any onerous constraints on the day-to-day site use under the proposed development scenario.

The RAP has met the objectives outlined in Section 1.2.

9.1 Regulatory Requirements

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

Table 9-1: Regulatory Requirement

Guideline / Legislation / Policy	Applicability
SEPP55	As the proposed development is to be approved via a SSDA, JKE has assessed that the remediation falls within Category 1 under SEPP55 (based on Clause 9[d]). However, this should be confirmed by the client's expert planner. Category 1 requires development consent. Under Clause 17 of SEPP55, a notice of completion of remediation work is to be given to council and the planning/consent authority within 30 days of completion of the work. The

Guideline / Legislation / Policy	Applicability
	notice of completion of remediation works must be in accordance with Clause 18 of SEPP55.
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 A and Class B) asbestos removal works or handling. Reference is to be made to the AMP for further details regarding the regulatory requirements for managing asbestos during remediation.
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.

10 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 lower ground level 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 assessment. If the subject site is sold, ownership of the assessment report should be transferred by JKE to the new site owners who will be informed of the conditions and limitations under which the assessment was undertaken. No person should apply an assessment 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 assessment 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 assessments 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 assessment 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.

Assessment Limitations
Although information provided by a site assessment can reduce exposure to the risk of the presence of contamination, no environmental site assessment can eliminate the risk. Even a rigorous professional assessment 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 Assessments by Design Professionals

Costly problems can occur when other design professionals develop plans based on misinterpretation of an assessment 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 Assessment 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 assessment. 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 assessment. 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 assessment 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 assessment 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 assessment, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to any questions.

Appendix A: Figures

AERIAL IMAGE SOURCE: MAPS.AU.NEARMAP.COM

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

Title: **SITE LOCATION PLAN**

Location: STAGE 2, NEPEAN HOSPITAL, DERBY STREET, KINGSWOOD, NSW

Project No: E34236PL

Figure No: 1

JKEnvironments

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PARKER STREET

JKE1(>0.3)
JKE2(>0.3)
JKE3(>0.2)
JKE4(>0.1)
JKE/MW25(0.4)
JKE26(0.5)
JKE12(>0.3)
JKE15(0.3)
JKE14(>0.2)
JKE13(0.3)
FCF2
FCF1
JKE27(0.5)
JKE16(>0.35)
JKE/MW24(0.6)
JKE8a(>0.2)
JKE5(>0.2)
JKE8(>0.5)
JKE/MW23(2.0)
JKE7(0.1)
JKE11(0.2)
JKE6(>0.4)
JKE18(0.1)
JKE17(>0.4)
JKE/MW22(0.5)
JKE9(>0.5)
JKE10(1.0)
JKE21(0.4)
JKE19(0.2)
JKE20(0.4)

TRH/BTEX IN GROUNDWATER (GOLDER 2010)

BONDED ACM IN SOIL

FLAMMABLE LIQUIDS STORE

BONDED ACM AT GROUND SURFACE

SUSPECTED UST

LEGEND

APPROXIMATE SITE BOUNDARY	
BH(Fill Depth)	BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m)
BH/MW(Fill Depth)	BOREHOLE AND GROUNDWATER MONITORING WELL LOCATION, NUMBER AND DEPTH OF FILL (m)
FCF(Surface)	FIBRE CEMENT FRAGMENT LOCATION, NUMBER AND DEPTH (Surface/m)

AERIAL IMAGE SOURCE: MAPS.AU.NEARMAP.COM

0 10 20 30 40 50

SCALE 1:1000 @A3 METRES

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

Title: **SAMPLE LOCATION AND NOTABLE FEATURES PLAN**

Location: STAGE 2, NEPEAN HOSPITAL, DERBY STREET, KINGSWOOD, NSW

Project No: E34236PL

Figure No: 2

JKEnvironments

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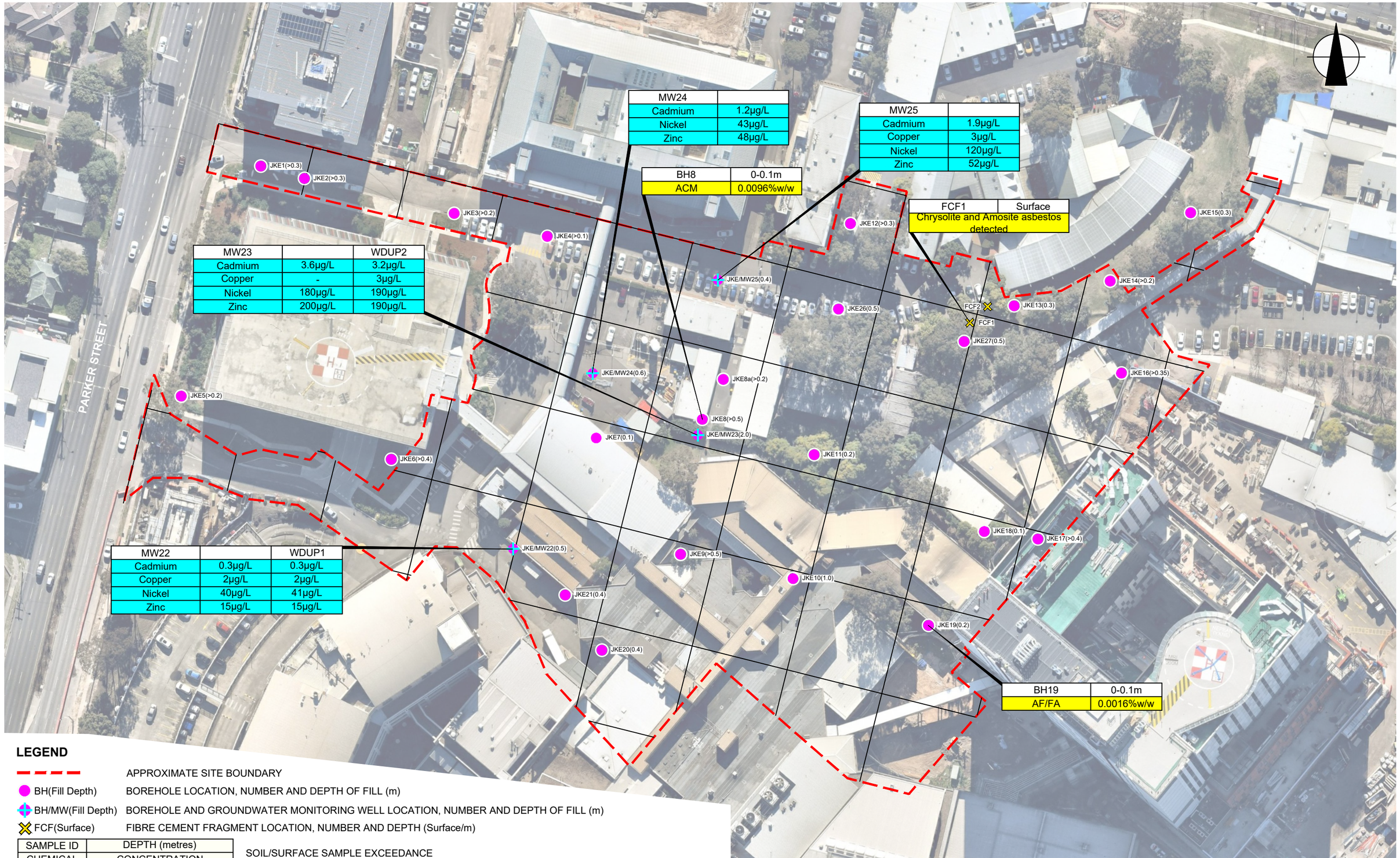

LEGEND

- APPROXIMATE SITE BOUNDARY
- BH(Fill Depth) — BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m)
- BH/MW(Fill Depth) — BOREHOLE AND GROUNDWATER MONITORING WELL LOCATION, NUMBER AND DEPTH OF FILL (m)
- FCF(Surface) — FIBRE CEMENT FRAGMENT LOCATION, NUMBER AND DEPTH (Surface/m)

SAMPLE ID	DEPTH (metres)
CHEMICAL	CONCENTRATION

SOIL/SURFACE SAMPLE EXCEEDANCE

SAMPLE ID	-
CHEMICAL	CONCENTRATION (µg/L)

GROUNDWATER SAMPLE EXCEEDANCE

SOIL/SURFACE CONTAMINATION ABOVE SAC FOR HUMAN HEALTH RISK

GROUNDWATER CONTAMINATION ABOVE SAC

AERIAL IMAGE SOURCE: MAPS.AU.NEARMAP.COM

0 10 20 30 40 50
SCALE 1:1000 @A3 METRES

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

Title: **SAC EXCEEDANCE PLAN**

Location: STAGE 2, NEPEAN HOSPITAL, DERBY STREET, KINGSWOOD, NSW

Project No: E34236PL

Figure No: 3

JKEnvironments

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Appendix B: DSI Summary Data Tables and Logs

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.

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

QA/QC Table:

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

TABLE S1
SOIL LABORATORY RESULTS COMPARED TO NEPM 2013.
HIL-D: 'Commercial/Industrial'

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)			3000	900	3600	240000	1500	730	6000	400000	4000	40	80	2000	2500	45	530	3600	50	2000	7	Detected/Not Detected
Sample Reference	**Sample Depth**	**Sample Description**																				
JKE1	0-0.1	Fill: silty clay	**5**	<0.4	**15**	**23**	**98**	<0.1	**13**	**62**	**0.4**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
JKE1 - Lab replicate	0-0.1	Fill: silty clay	**5**	<0.4	**15**	**20**	**88**	<0.1	**10**	**74**	**0.4**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
JKE2	0-0.1	Fill: silty sand	<4	<0.4	**3**	**3**	**5**	<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	Not Detected
JKE2	0.1-0.3	Fill: silty gravelly clay	**5**	<0.4	**22**	**18**	**15**	<0.1	**15**	**32**	**9.1**	**0.9**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
JKE3	0-0.1	Fill: silty sand	<4	<0.4	**4**	**4**	**5**	<0.1	**4**	**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
JKE3	0.1-0.2	Fill: silty gravelly clay	**9**	<0.4	**19**	**24**	**18**	<0.1	**9**	**40**	**0.3**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
JKE4	0-0.1	Fill: silty gravelly sand	<4	<0.4	**27**	**16**	**18**	<0.1	**12**	**30**	**1.5**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Detected
JKE5	0.05-0.2	Fill: silty gravelly clay	**8**	<0.4	**11**	**39**	**15**	<0.1	**13**	**55**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
JKE6	0.05-0.25	Fill: silty sand	**5**	<0.4	**13**	**23**	**14**	<0.1	**9**	**63**	**0.05**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
JKE6	0.25-0.4	Fill: silty clay	**6**	<0.4	**17**	**40**	**15**	<0.1	**27**	**61**	**1.1**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
JKE7	0.04-0.1	Fill: silty gravelly sand	<4	<0.4	**15**	**54**	**1**	<0.1	**140**	**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
JKE7 - Lab replicate	0.04-0.1	Fill: silty gravelly sand	<4	<0.4	**18**	**57**	**1**	<0.1	**140**	**49**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
JKE7	0.1-0.3	Silty clay	**7**	<0.4	**14**	**15**	**8**	<0.1	**5**	**16**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
JKE8	0-0.1	Fill: silty sandy clay	**8**	<0.4	**15**	**37**	**18**	<0.1	**7**	**93**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
JKE9	0-0.1	Fill: silty clayey sand	**6**	<0.4	**18**	**91**	**92**	**0.1**	**14**	**300**	**0.56**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Detected
JKE9 - Lab replicate	0-0.1	Fill: silty clayey sand	**6**	<0.4	**19**	**88**	**96**	**0.1**	**16**	**230**	**0.74**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
JKE9	0.35-0.5	Fill: silty sandy clay	**4**	<0.4	**51**	**21**	**26**	<0.1	**30**	**50**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
JKE10	0-0.1	Fill: silty clayey sand	**5**	<0.4	**12**	**57**	**59**	<0.1	**10**	**150**	**0.05**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
JKE10	0.2-0.5	Fill: silty gravelly clay	**5**	<0.4	**20**	**26**	**16**	<0.1	**8**	**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
JKE10	1.0-1.1	Silty clay	<4	<0.4	**13**	**14**	**8**	<0.1	**4**	**16**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
JKE11	0-0.1	Fill: silty clayey sand	<4	<0.4	**10**	**13**	**17**	<0.1	**6**	**45**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
JKE11	0.1-0.2	Fill: silty clay	**5**	<0.4	**14**	**16**	**14**	<0.1	**5**	**22**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
JKE11	0.2-0.3	Silty clay	<4	<0.4	**20**	**17**	**12**	<0.1	**10**	**17**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
JKE12	0.1-0.3	Fill: silty sand	**7**	<0.4	**41**	**22**	**24**	<0.1	**14**	**73**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
JKE13	0-0.1	Fill: silty sand	**5**	<0.4	**9**	**21**	**18**	<0.1	**22**	**100**	**1.5**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
JKE13	0.1-0.3	Fill: silty gravelly clay	**5**	<0.4	**16**	**24**	**18**	<0.1	**28**	**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
JKE13	0.3-0.4	Silty clay	**4**	<0.4	**8**	**30**	**11**	<0.1	**5**	**17**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
JKE14	0-0.1	Fill: silty clayey sand	**4**	<0.4	**8**	**17**	**17**	<0.1	**20**	**86**	**1.8**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
JKE14	0.1-0.2	Fill: silty gravelly clay	**5**	<0.4	**13**	**25**	**15**	<0.1	**23**	**33**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
JKE14 - Lab replicate	0.1-0.2	Fill: silty gravelly clay	**5**	<0.4	**14**	**24**	**17**	<0.1	**22**	**34**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
JKE15	0-0.1	Fill: silty sandy clay	**6**	<0.4	**17**	**21**	**27**	<0.1	**11**	**55**	**0.3**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
JKE15	0.3-0.35	Silty clay	<4	<0.4	**6**	**17**	**7**	<0.1	**3**	**12**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
JKE16	0-0.1	Fill: silty sand	**7**	<0.4	**15**	**29**	**78**	**0.1**	**14**	**120**	**0.88**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
JKE16	0.3-0.35	Fill: silty clayey sand	**11**	<0.4	**18**	**16**	**16**	<0.1	**7**	**27**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
JKE17	0-0.1	Fill: silty gravelly clay	**6**	<0.4	**17**	**22**	**18**	<0.1	**8**	**40**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
JKE18	0-0.1	Fill: silty sandy clay	**5**	<0.4	**13**	**19**	**16**	<0.1	**8**	**44**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
JKE18 - Lab replicate	0-0.1	Fill: silty sandy clay	**4**	<0.4	**13**	**19**	**17**	<0.1	**9**	**45**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
JKE18	0.1-0.3	Silty clay	<4	<0.4	**15**	**35**	**12**	<0.1	**11**	**42**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
JKE19	0-0.1	Fill: silty sand	<4	<0.4	**6**	**17**	**30**	<0.1	**4**	**56**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Detected
JKE19	0.1-0.2	Fill: silty sand	<4	<0.4	**7**	**13**	**22**	<0.1	**5**	**43**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
JKE19	0.3-0.5	Silty clay	<4	<0.4	**13**	**35**	**12**	<0.1	**11**	**46**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
JKE20	0.05-0.2	Fill: silty gravelly sand	<4	<0.4	**32**	**83**	**4**	<0.1	**71**	**46**	**4**	**0.6**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
JKE20	0.2-0.4	Fill: silty clay	**5**	<0.4	**21**	**41**	**14**	<0.1	**24**	**62**	**0.06**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
JKE20	0.5-0.95	Silty clay	<4	<0.4	**4**	**7**	**5**	<0.1	**2**	**11**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
JKE21	0.05-0.2	Fill: silty gravelly sand	<4	<0.4	**67**	**20**	**4**	<0.1	**27**	**31**	**0.2**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
JKE21	0.2-0.4	Fill: silty clayey sand	<4	<0.4	**15**	**8**	**7**	<0.1	**12**	**15**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
JKE21	0.5-0.95	Silty clay	<4	<0.4	**8**	**15**	**7**	<0.1	**3**	**13**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
JKE22	0.05-0.2	Fill: silty gravelly sand	<4	<0.4	**13**	**87**	**3**	<0.1	**42**	**30**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
JKE22	0.2-0.4	Fill: silty sandy gravel	<4	<0.4	**6**	**8**	**6**	<0.1	**5**	**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
JKE22 - Lab replicate	0.2-0.4	Fill: silty sandy gravel	<4	<0.4	**7**	**7**	**7**	<0.1	**5**	**13**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
JKE22	0.5-0.95	Silty clay	<4	<0.4	**8**	**11**	**6**	<0.1	**3**	**17**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
JKE23	0-0.1	Fill: silty sandy clay	<4	<0.4	**7**	**15**	**8**	<0.1	**5**	**22**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
JKE23	0.5-0.8	Fill: silty clay	**5**	<0.4	**13**	**17**	**12**	<0.1	**5**	**22**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
JKE23	2.3-2.5	Silty clay	<4	<0.4	**12**	**17**	**15**	<0.1	**2**	**11**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
JKE24	0.04-0.4	Fill: silty gravelly sand	<4	<0.4	**11**	**82**	**2**	<0.1	**130**	**35**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
JKE24	0.4-0.6	Fill: silty gravelly clay	**9**	<0.4	**12**	**17**	**18**	<0.1	**18**	**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
JKE24	0.8-1.0	Silty clay	**13**	<0.4	**13**	**24**	**23**	<0.1	**10**	**48**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
JKE25	0.05-0.4	Fill: silty gravelly clay	<4	<0.4	**14**	**47**	**4**	<0.1	**110**	**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
JKE25	0.6-0.8	Silty clay	**6**	<0.4	**14**	**21**	**10**	<0.1	**5**	**17**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
JKE26	0.05-0.3	Fill: silty sand	<4	<0.4	**12**	**10**	**19**	**0.1**	**5**	**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
JKE26 - Lab replicate	0.05-0.3	Fill: silty sand	<4	<0.4	**18**	**12**	**20**	**0.1**	**4**	**27**	**0.06**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
JKE26 - Lab triplicate	0.05-0.3	Fill: silty sand	<4	<0.4	**13**	**12**	**23**	**0.1**	**4**	**27**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
JKE26	0.3-0.5	Fill: silty clayey sand	**4**	<0.4	**17**	**13**	**33**	<0.1	**8**	**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
JKE26	0.8-1.0	Silty clay	<4	<0.4	**8**	**15**	**8**	<0.1	**2**	**13**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
JKE27	0-0.1	Fill: silty sandy clay	**7**	<0.4	**17**	**16**	**27**	<0.1	**6**	**38**	**0.2**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
JKE27	0.8-1.0	Silty clay	**8**	<0.4	**18**	**13**	**16**	<0.1	**3**	**16**	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SDUP1	0-0.1	Fill: silty clayey sand	**12**	<0.4	**20**	**96**	**100**	**0.2**	**15**	**210**	**0.2**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
SDUP2	0-0.1	Fill: silty clay	**6**	<0.4	**18**	**18**	**70**	<0.1	**10**	**62**	**0.87**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
SDUP3	0.05-0.2	Fill: silty gravelly sand	<4	<0.4	**12**	**110**	**3**	<0.1	**43**	**34**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
SDUP4	0.1-0.2	Fill: silty sand	**6**	<0.4	**15**	**24**	**27**	<0.1	**15**	**81**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
SDUP5	0-0.1	Fill: silty sandy clay	**5**	<0.4	**12**	**21**	**21**	<0.1	**9**	**50**	**0.3**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
SDUP6	0-0.1	Fill: silty sandy clay	**5**	<0.4	**15**	**19**	**17**	<0.1	**9**	**50**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
SDUP6 - Lab replicate	0-0.1	Fill: silty sandy clay	NA	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
SDUP7	0-0.1	Fill: silty clayey sand	<4	<0.4	**9**	**13**	**16**	<0.1	**5**	**43**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
SDUP8	0.05-0.3	Fill: silty sand	<4	<0.4	**18**	**17**	**18**	**0.1**	**4**	**28**	**0.08**	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
SDUP9	0.05-0.2	Fill: silty gravelly sand	**6**	<0.4	**75**	**24**	**9**	<0.1	**30**	**33**	<0.2	<2	<0.4	<0.1	<0.4	<0.1	<0.1	<0.1	<0.4	<0.4	<0.1	<2.5	NA
SDUP9 - Lab replicate	0.05-0.2	Fill: silty gravelly sand	**6**	<0.4	**78**	**24**	**9**	<0.1	**29**	**31**	<0.2	<2	<0.4	<0.1	<0.4	<0.1	<0.1	<0.4	<0.4	<0.4	<0.1	<2.5	NA
SDUP10	0.05-0.4	Fill: silty gravelly clay	**6**	<0.4	**20**	**55**	**10**	<0.1	**110**	**44**	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<2.5	NA
FCF1	Surface	FCF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Detected
FCF2	Surface	FCF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Not Detected
FCF1-JKE8	0-0.1	FCF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Detected
FCF1-JKE23	0-0.1	FCF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Not Detected
Total Number of Samples			77	77	77	77	77	77	77	77	77	77	62	62	62	62	62	62	62	62	62	47
Maximum Value			13	<PQL	78	110	100	0.2	140	300	9.1	0.9	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	Detected

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

JKEnvironments

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-D: COMMERCIAL/INDUSTRIAL							
Sample Reference	**Sample Depth**	**Sample Description**	**Depth Category**	**Soil Category**								
JKE1	0-0.1	Fill: silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE1 - Lab replicate	0-0.1	Fill: silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE2	0-0.1	Fill: silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE2	0.1-0.3	Fill: silty gravelly clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE3	0-0.1	Fill: silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE3	0.1-0.2	Fill: silty gravelly clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE4	0-0.1	Fill: silty gravelly sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE5	0.05-0.2	Fill: silty gravelly clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE6	0.05-0.25	Fill: silty sand	0m to <1m	Sand	<25	**95**	<0.2	<0.5	<1	<3	<1	0
JKE6	0.25-0.4	Fill: silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE7	0.04-0.1	Fill: silty gravelly sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE7 - Lab replicate	0.04-0.1	Fill: silty gravelly sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE7	0.1-0.3	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE8	0-0.1	Fill: silty sandy clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE9	0-0.1	Fill: silty clayey sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE9 - Lab replicate	0-0.1	Fill: silty clayey sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE9	0.35-0.5	Fill: silty sandy clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE10	0-0.1	Fill: silty clayey sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE10	0.2-0.5	Fill: silty gravelly clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE10	1.0-1.1	Silty clay	1m to <2m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE11	0-0.1	Fill: silty clayey sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE11	0.1-0.2	Fill: silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE11	0.2-0.3	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE12	0.1-0.3	Fill: silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE13	0-0.1	Fill: silty sand	0m to <1m	Sand	<25	**56**	<0.2	<0.5	<1	<3	<1	0
JKE13	0.1-0.3	Fill: silty gravelly clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE13	0.3-0.4	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE14	0-0.1	Fill: silty clayey sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE14	0.1-0.2	Fill: silty gravelly clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE14 - Lab replicate	0.1-0.2	Fill: silty gravelly clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE15	0-0.1	Fill: silty sandy clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE15	0.3-0.35	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE16	0-0.1	Fill: silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE16	0.3-0.35	Fill: silty clayey sand	0m to <1m	Sand	<25	**120**	<0.2	<0.5	<1	<3	<1	0
JKE17	0-0.1	Fill: silty gravelly clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE18	0-0.1	Fill: silty sandy clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE18 - Lab replicate	0-0.1	Fill: silty sandy clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE18	0.1-0.3	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE19	0-0.1	Fill: silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE19	0.1-0.2	Fill: silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE19	0.3-0.5	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE20	0.05-0.2	Fill: silty gravelly sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE20	0.2-0.4	Fill: silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE20	0.5-0.95	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE21	0.05-0.2	Fill: silty gravelly sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE21	0.2-0.4	Fill: silty clayey sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE21	0.5-0.95	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE22	0.05-0.2	Fill: silty gravelly sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE22	0.2-0.4	Fill: silty sandy gravel	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE22 - Lab replicate	0.2-0.4	Fill: silty sandy gravel	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE22	0.5-0.95	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE23	0-0.1	Fill: silty sandy clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE23	0.5-0.8	Fill: silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE23	2.3-2.5	Silty clay	2m to <4m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE24	0.04-0.4	Fill: silty gravelly sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE24	0.4-0.6	Fill: silty gravelly clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE24	0.8-1.0	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE25	0.05-0.4	Fill: silty gravelly clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE25	0.6-0.8	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE26	0.05-0.3	Fill: silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE26 - Lab replicate	0.05-0.3	Fill: silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE26	0.3-0.5	Fill: silty clayey sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE26	0.8-1.0	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE27	0-0.1	Fill: silty sandy clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
JKE27	0.8-1.0	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
SDUP1	0-0.1	Fill: silty clayey sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
SDUP2	0-0.1	Fill: silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
SDUP3	0.05-0.2	Fill: silty gravelly sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
SDUP4	0.1-0.2	Fill: silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
SDUP5	0-0.1	Fill: silty sandy clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
SDUP6	0-0.1	Fill: silty sandy clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
SDUP6 - Lab replicate	0-0.1	Fill: silty sandy clay	0m to <1m	Sand	NA	<50	NA	NA	NA	NA	NA	0
SDUP7	0-0.1	Fill: silty clayey sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
SDUP8	0.05-0.3	Fill: silty sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
SDUP9	0.05-0.2	Fill: silty gravelly sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	NA	<1	0
SDUP9 - Lab replicate	0.05-0.2	Fill: silty gravelly sand	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	NA	<1	0
SDUP10	0.05-0.4	Fill: silty gravelly clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	NA	<1	0
FCF2	Surface	FCF			NA	NA	NA	NA	NA	NA	NA	NA
FCF1-JKE23	0-0.1	FCF			NA	NA	NA	NA	NA	NA	NA	NA
Total Number of Samples					76	77	76	76	76	73	76	77
Maximum Value					<PQL	120	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL

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
JKE1	0-0.1	Fill: silty clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE1 - Lab replicate	0-0.1	Fill: silty clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE2	0-0.1	Fill: silty sand	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE2	0.1-0.3	Fill: silty gravelly clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE3	0-0.1	Fill: silty sand	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE3	0.1-0.2	Fill: silty gravelly clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE4	0-0.1	Fill: silty gravelly sand	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE5	0.05-0.2	Fill: silty gravelly clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE6	0.05-0.25	Fill: silty sand	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE6	0.25-0.4	Fill: silty clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE7	0.04-0.1	Fill: silty gravelly sand	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE7 - Lab replicate	0.04-0.1	Fill: silty gravelly sand	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE7	0.1-0.3	Silty clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE8	0-0.1	Fill: silty sandy clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE9	0-0.1	Fill: silty clayey sand	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE9 - Lab replicate	0-0.1	Fill: silty clayey sand	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE9	0.35-0.5	Fill: silty sandy clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE10	0-0.1	Fill: silty clayey sand	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE10	0.2-0.5	Fill: silty gravelly clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE10	1.0-1.1	Silty clay	1m to <2m	Sand	370	NL	3	NL	NL	NL	NL
JKE11	0-0.1	Fill: silty clayey sand	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE11	0.1-0.2	Fill: silty clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE11	0.2-0.3	Silty clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE12	0.1-0.3	Fill: silty sand	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE13	0-0.1	Fill: silty sand	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE13	0.1-0.3	Fill: silty gravelly clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE13	0.3-0.4	Silty clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE14	0-0.1	Fill: silty clayey sand	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE14	0.1-0.2	Fill: silty gravelly clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE14 - Lab replicate	0.1-0.2	Fill: silty gravelly clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE15	0-0.1	Fill: silty sandy clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE15	0.3-0.35	Silty clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE16	0-0.1	Fill: silty sand	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE16	0.3-0.35	Fill: silty clayey sand	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE17	0-0.1	Fill: silty gravelly clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE18	0-0.1	Fill: silty sandy clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE18 - Lab replicate	0-0.1	Fill: silty sandy clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE18	0.1-0.3	Silty clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE19	0-0.1	Fill: silty sand	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE19	0.1-0.2	Fill: silty sand	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE19	0.3-0.5	Silty clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE20	0.05-0.2	Fill: silty gravelly sand	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE20	0.2-0.4	Fill: silty clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE20	0.5-0.95	Silty clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE21	0.05-0.2	Fill: silty gravelly sand	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE21	0.2-0.4	Fill: silty clayey sand	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE21	0.5-0.95	Silty clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE22	0.05-0.2	Fill: silty gravelly sand	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE22	0.2-0.4	Fill: silty sandy gravel	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE22 - Lab replicate	0.2-0.4	Fill: silty sandy gravel	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE22	0.5-0.95	Silty clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE23	0-0.1	Fill: silty sandy clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE23	0.5-0.8	Fill: silty clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE23	2.3-2.5	Silty clay	2m to <4m	Sand	630	NL	3	NL	NL	NL	NL
JKE24	0.04-0.4	Fill: silty gravelly sand	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE24	0.4-0.6	Fill: silty gravelly clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE24	0.8-1.0	Silty clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE25	0.05-0.4	Fill: silty gravelly clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE25	0.6-0.8	Silty clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE26	0.05-0.3	Fill: silty sand	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE26 - Lab replicate	0.05-0.3	Fill: silty sand	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE26	0.3-0.5	Fill: silty clayey sand	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE26	0.8-1.0	Silty clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE27	0-0.1	Fill: silty sandy clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
JKE27	0.8-1.0	Silty clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
SDUP1	0-0.1	Fill: silty clayey sand	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
SDUP2	0-0.1	Fill: silty clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
SDUP3	0.05-0.2	Fill: silty gravelly sand	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
SDUP4	0.1-0.2	Fill: silty sand	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
SDUP5	0-0.1	Fill: silty sandy clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
SDUP6	0-0.1	Fill: silty sandy clay	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
SDUP6 - Lab replicate	0-0.1	Fill: silty sandy clay	0m to <1m	Sand	NA	NL	NA	NA	NA	NA	NA
SDUP7	0-0.1	Fill: silty clayey sand	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
SDUP8	0.05-0.3	Fill: silty sand	0m to <1m	Sand	260	NL	3	NL	NL	230	NL
SDUP9	0.05-0.2	Fill: silty gravelly sand	0m to <1m	Sand	260	NL	3	NL	NL	NA	NL
SDUP9 - Lab replicate	0.05-0.2	Fill: silty gravelly sand	0m to <1m	Sand	260	NL	3	NL	NL	NA	NL
SDUP10	0.05-0.4	Fill: silty gravelly clay	0m to <1m	Sand	260	NL	3	NL	NL	NA	NL
FCF2	Surface	FCF			NA	NA	NA	NA	NA	NA	NA
FCF1-JKE23	0-0.1	FCF			NA	NA	NA	NA	NA	NA	NA

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			**COMMERCIAL/INDUSTRIAL**			
Sample Reference	**Sample Depth**	**Soil Texture**				
JKE1	0-0.1	Coarse	<25	<50	**110**	<100
JKE1 - Lab replicate	0-0.1	Coarse	<25	<50	**150**	**160**
JKE2	0-0.1	Coarse	<25	<50	<100	<100
JKE2	0.1-0.3	Coarse	<25	<50	<100	<100
JKE3	0-0.1	Coarse	<25	<50	<100	<100
JKE3	0.1-0.2	Coarse	<25	<50	<100	<100
JKE4	0-0.1	Coarse	<25	<50	<100	<100
JKE5	0.05-0.2	Coarse	<25	<50	<100	<100
JKE6	0.05-0.25	Coarse	<25	**95**	**1000**	**400**
JKE6	0.25-0.4	Coarse	<25	<50	<100	<100
JKE7	0.04-0.1	Coarse	<25	<50	<100	<100
JKE7 - Lab replicate	0.04-0.1	Coarse	<25	<50	<100	<100
JKE7	0.1-0.3	Coarse	<25	<50	<100	<100
JKE8	0-0.1	Coarse	<25	<50	**140**	<100
JKE9	0-0.1	Coarse	<25	<50	**200**	**100**
JKE9 - Lab replicate	0-0.1	Coarse	<25	<50	**240**	**120**
JKE9	0.35-0.5	Coarse	<25	<50	<100	<100
JKE10	0-0.1	Coarse	<25	<50	**870**	**400**
JKE10	0.2-0.5	Coarse	<25	<50	<100	<100
JKE10	1.0-1.1	Coarse	<25	<50	<100	<100
JKE11	0-0.1	Coarse	<25	<50	<100	<100
JKE11	0.1-0.2	Coarse	<25	<50	<100	<100
JKE11	0.2-0.3	Coarse	<25	<50	<100	<100
JKE12	0.1-0.3	Coarse	<25	<50	**240**	<100
JKE13	0-0.1	Coarse	<25	**56**	**360**	**130**
JKE13	0.1-0.3	Coarse	<25	<50	<100	<100
JKE13	0.3-0.4	Coarse	<25	<50	<100	<100
JKE14	0-0.1	Coarse	<25	<50	**340**	**120**
JKE14	0.1-0.2	Coarse	<25	<50	<100	<100
JKE14 - Lab replicate	0.1-0.2	Coarse	<25	<50	<100	<100
JKE15	0-0.1	Coarse	<25	<50	<100	<100
JKE15	0.3-0.35	Coarse	<25	<50	<100	<100
JKE16	0-0.1	Coarse	<25	<50	**140**	**120**
JKE16	0.3-0.35	Coarse	<25	**120**	**160**	<100
JKE17	0-0.1	Coarse	<25	<50	<100	<100
JKE18	0-0.1	Coarse	<25	<50	<100	<100
JKE18 - Lab replicate	0-0.1	Coarse	<25	<50	<100	<100
JKE18	0.1-0.3	Coarse	<25	<50	<100	<100
JKE19	0-0.1	Coarse	<25	<50	**120**	<100
JKE19	0.1-0.2	Coarse	<25	<50	<100	<100
JKE19	0.3-0.5	Coarse	<25	<50	<100	<100
JKE20	0.05-0.2	Coarse	<25	<50	**300**	**570**
JKE20	0.2-0.4	Coarse	<25	<50	<100	**140**
JKE20	0.5-0.95	Coarse	<25	<50	<100	<100
JKE21	0.05-0.2	Coarse	<25	<50	**780**	**930**
JKE21	0.2-0.4	Coarse	<25	<50	**110**	**150**
JKE21	0.5-0.95	Coarse	<25	<50	<100	<100
JKE22	0.05-0.2	Coarse	<25	<50	**160**	**140**
JKE22	0.2-0.4	Coarse	<25	<50	<100	<100
JKE22 - Lab replicate	0.2-0.4	Coarse	<25	<50	<100	<100
JKE22	0.5-0.95	Coarse	<25	<50	<100	<100
JKE23	0-0.1	Coarse	<25	<50	<100	<100
JKE23	0.5-0.8	Coarse	<25	<50	<100	<100
JKE23	2.3-2.5	Coarse	<25	<50	<100	<100
JKE24	0.04-0.4	Coarse	<25	<50	<100	<100
JKE24	0.4-0.6	Coarse	<25	<50	<100	<100
JKE24	0.8-1.0	Coarse	<25	<50	<100	<100
JKE25	0.05-0.4	Coarse	<25	<50	<100	<100
JKE25	0.6-0.8	Coarse	<25	<50	<100	<100
JKE26	0.05-0.3	Coarse	<25	<50	<100	<100
JKE26 - Lab replicate	0.05-0.3	Coarse	<25	<50	<100	**110**
JKE26	0.3-0.5	Coarse	<25	<50	<100	<100
JKE26	0.8-1.0	Coarse	<25	<50	<100	<100
JKE27	0-0.1	Coarse	<25	<50	<100	<100
JKE27	0.8-1.0	Coarse	<25	<50	<100	<100
SDUP1	0-0.1	Coarse	<25	<50	**260**	**130**
SDUP2	0-0.1	Coarse	<25	<50	**190**	**170**
SDUP3	0.05-0.2	Coarse	<25	<50	**230**	**180**
SDUP4	0.1-0.2	Coarse	<25	<50	**150**	<100
SDUP5	0-0.1	Coarse	<25	<50	<100	<100
SDUP6	0-0.1	Coarse	<25	<50	<100	<100
SDUP6 - Lab replicate	0-0.1	Coarse	NA	<50	<100	<100
SDUP7	0-0.1	Coarse	<25	<50	<100	<100
SDUP8	0.05-0.3	Coarse	<25	<50	**100**	**190**
SDUP9	0.05-0.2	Coarse	<25	<50	**1000**	**1100**
SDUP9 - Lab replicate	0.05-0.2	Coarse	<25	<50	**1200**	**1400**
SDUP10	0.05-0.4	Coarse	<25	<50	<100	<100
FCF2	Surface		NA	NA	NA	NA
FCF1-JKE23	0-0.1		NA	NA	NA	NA
Total Number of Samples			76	77	77	77
Maximum Value			<PQL	120	1200	1400

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)
JKE1	0-0.1	Coarse	700	1000	3500	10000
JKE1 - Lab replicate	0-0.1	Coarse	700	1000	3500	10000
JKE2	0-0.1	Coarse	700	1000	3500	10000
JKE2	0.1-0.3	Coarse	700	1000	3500	10000
JKE3	0-0.1	Coarse	700	1000	3500	10000
JKE3	0.1-0.2	Coarse	700	1000	3500	10000
JKE4	0-0.1	Coarse	700	1000	3500	10000
JKE5	0.05-0.2	Coarse	700	1000	3500	10000
JKE6	0.05-0.25	Coarse	700	1000	3500	10000
JKE6	0.25-0.4	Coarse	700	1000	3500	10000
JKE7	0.04-0.1	Coarse	700	1000	3500	10000
JKE7 - Lab replicate	0.04-0.1	Coarse	700	1000	3500	10000
JKE7	0.1-0.3	Coarse	700	1000	3500	10000
JKE8	0-0.1	Coarse	700	1000	3500	10000
JKE9	0-0.1	Coarse	700	1000	3500	10000
JKE9 - Lab replicate	0-0.1	Coarse	700	1000	3500	10000
JKE9	0.35-0.5	Coarse	700	1000	3500	10000
JKE10	0-0.1	Coarse	700	1000	3500	10000
JKE10	0.2-0.5	Coarse	700	1000	3500	10000
JKE10	1.0-1.1	Coarse	700	1000	3500	10000
JKE11	0-0.1	Coarse	700	1000	3500	10000
JKE11	0.1-0.2	Coarse	700	1000	3500	10000
JKE11	0.2-0.3	Coarse	700	1000	3500	10000
JKE12	0.1-0.3	Coarse	700	1000	3500	10000
JKE13	0-0.1	Coarse	700	1000	3500	10000
JKE13	0.1-0.3	Coarse	700	1000	3500	10000
JKE13	0.3-0.4	Coarse	700	1000	3500	10000
JKE14	0-0.1	Coarse	700	1000	3500	10000
JKE14	0.1-0.2	Coarse	700	1000	3500	10000
JKE14 - Lab replicate	0.1-0.2	Coarse	700	1000	3500	10000
JKE15	0-0.1	Coarse	700	1000	3500	10000
JKE15	0.3-0.35	Coarse	700	1000	3500	10000
JKE16	0-0.1	Coarse	700	1000	3500	10000
JKE16	0.3-0.35	Coarse	700	1000	3500	10000
JKE17	0-0.1	Coarse	700	1000	3500	10000
JKE18	0-0.1	Coarse	700	1000	3500	10000
JKE18 - Lab replicate	0-0.1	Coarse	700	1000	3500	10000
JKE18	0.1-0.3	Coarse	700	1000	3500	10000
JKE19	0-0.1	Coarse	700	1000	3500	10000
JKE19	0.1-0.2	Coarse	700	1000	3500	10000
JKE19	0.3-0.5	Coarse	700	1000	3500	10000
JKE20	0.05-0.2	Coarse	700	1000	3500	10000
JKE20	0.2-0.4	Coarse	700	1000	3500	10000
JKE20	0.5-0.95	Coarse	700	1000	3500	10000
JKE21	0.05-0.2	Coarse	700	1000	3500	10000
JKE21	0.2-0.4	Coarse	700	1000	3500	10000
JKE21	0.5-0.95	Coarse	700	1000	3500	10000
JKE22	0.05-0.2	Coarse	700	1000	3500	10000
JKE22	0.2-0.4	Coarse	700	1000	3500	10000
JKE22 - Lab replicate	0.2-0.4	Coarse	700	1000	3500	10000
JKE22	0.5-0.95	Coarse	700	1000	3500	10000
JKE23	0-0.1	Coarse	700	1000	3500	10000
JKE23	0.5-0.8	Coarse	700	1000	3500	10000
JKE23	2.3-2.5	Coarse	700	1000	3500	10000
JKE24	0.04-0.4	Coarse	700	1000	3500	10000
JKE24	0.4-0.6	Coarse	700	1000	3500	10000
JKE24	0.8-1.0	Coarse	700	1000	3500	10000
JKE25	0.05-0.4	Coarse	700	1000	3500	10000
JKE25	0.6-0.8	Coarse	700	1000	3500	10000
JKE26	0.05-0.3	Coarse	700	1000	3500	10000
JKE26 - Lab replicate	0.05-0.3	Coarse	700	1000	3500	10000
JKE26	0.3-0.5	Coarse	700	1000	3500	10000
JKE26	0.8-1.0	Coarse	700	1000	3500	10000
JKE27	0-0.1	Coarse	700	1000	3500	10000
JKE27	0.8-1.0	Coarse	700	1000	3500	10000
SDUP1	0-0.1	Coarse	700	1000	3500	10000
SDUP2	0-0.1	Coarse	700	1000	3500	10000
SDUP3	0.05-0.2	Coarse	700	1000	3500	10000
SDUP4	0.1-0.2	Coarse	700	1000	3500	10000
SDUP5	0-0.1	Coarse	700	1000	3500	10000
SDUP6	0-0.1	Coarse	700	1000	3500	10000
SDUP6 - Lab replicate	0-0.1	Coarse	NA	1000	3500	10000
SDUP7	0-0.1	Coarse	700	1000	3500	10000
SDUP8	0.05-0.3	Coarse	700	1000	3500	10000
SDUP9	0.05-0.2	Coarse	700	1000	3500	10000
SDUP9 - Lab replicate	0.05-0.2	Coarse	700	1000	3500	10000
SDUP10	0.05-0.4	Coarse	700	1000	3500	10000
FCF2	Surface		NA	NA	NA	NA
FCF1-JKE23	0-0.1		NA	NA	NA	NA

JKEnvironments

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		26,000	20,000	27,000	38,000	430	99,000	27,000	81,000	11,000	
Site Use		COMMERCIAL/INDUSTRIAL - DIRECT SOIL CONTACT									
Sample Reference	**Sample Depth**										
JKE1	0-0.1	<25	<50	**110**	<100	<0.2	<0.5	<1	<3	<1	0
JKE1 - Lab replicate	0-0.1	<25	<50	**150**	**160**	<0.2	<0.5	<1	<3	<1	0
JKE2	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE2	0.1-0.3	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE3	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE3	0.1-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE4	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE5	0.05-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE6	0.05-0.25	<25	**95**	**1000**	**400**	<0.2	<0.5	<1	<3	<1	0
JKE6	0.25-0.4	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE7	0.04-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE7 - Lab replicate	0.04-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE7	0.1-0.3	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE8	0-0.1	<25	<50	**140**	<100	<0.2	<0.5	<1	<3	<1	0
JKE9	0-0.1	<25	<50	**200**	**100**	<0.2	<0.5	<1	<3	<1	0
JKE9 - Lab replicate	0-0.1	<25	<50	**240**	**120**	<0.2	<0.5	<1	<3	<1	0
JKE9	0.35-0.5	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE10	0-0.1	<25	<50	**870**	**400**	<0.2	<0.5	<1	<3	<1	0
JKE10	0.2-0.5	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE10	1.0-1.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE11	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE11	0.1-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE11	0.2-0.3	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE12	0.1-0.3	<25	<50	**240**	<100	<0.2	<0.5	<1	<3	<1	0
JKE13	0-0.1	<25	**56**	**360**	**130**	<0.2	<0.5	<1	<3	<1	0
JKE13	0.1-0.3	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE13	0.3-0.4	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE14	0-0.1	<25	<50	**340**	**120**	<0.2	<0.5	<1	<3	<1	0
JKE14	0.1-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE14 - Lab replicate	0.1-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE15	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE15	0.3-0.35	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE16	0-0.1	<25	<50	**140**	**120**	<0.2	<0.5	<1	<3	<1	0
JKE16	0.3-0.35	<25	**120**	**160**	<100	<0.2	<0.5	<1	<3	<1	0
JKE17	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE18	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE18 - Lab replicate	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE18	0.1-0.3	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE19	0-0.1	<25	<50	**120**	<100	<0.2	<0.5	<1	<3	<1	0
JKE19	0.1-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE19	0.3-0.5	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE20	0.05-0.2	<25	<50	**300**	**570**	<0.2	<0.5	<1	<3	<1	0
JKE20	0.2-0.4	<25	<50	<100	**140**	<0.2	<0.5	<1	<3	<1	0
JKE20	0.5-0.95	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE21	0.05-0.2	<25	<50	**780**	**930**	<0.2	<0.5	<1	<3	<1	0
JKE21	0.2-0.4	<25	<50	**110**	**150**	<0.2	<0.5	<1	<3	<1	0
JKE21	0.5-0.95	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE22	0.05-0.2	<25	<50	**160**	**140**	<0.2	<0.5	<1	<3	<1	0
JKE22	0.2-0.4	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE22 - Lab replicate	0.2-0.4	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE22	0.5-0.95	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE23	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE23	0.5-0.8	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE23	2.3-2.5	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE24	0.04-0.4	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE24	0.4-0.6	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE24	0.8-1.0	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE25	0.05-0.4	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE25	0.6-0.8	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE26	0.05-0.3	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE26 - Lab replicate	0.05-0.3	<25	<50	<100	**110**	<0.2	<0.5	<1	<3	<1	0
JKE26	0.3-0.5	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE26	0.8-1.0	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE27	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
JKE27	0.8-1.0	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
SDUP1	0-0.1	<25	<50	**260**	**130**	<0.2	<0.5	<1	<3	<1	0
SDUP2	0-0.1	<25	<50	**190**	**170**	<0.2	<0.5	<1	<3	<1	0
SDUP3	0.05-0.2	<25	<50	**230**	**180**	<0.2	<0.5	<1	<3	<1	0
SDUP4	0.1-0.2	<25	<50	**150**	<100	<0.2	<0.5	<1	<3	<1	0
SDUP5	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
SDUP6	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
SDUP6 - Lab replicate	0-0.1	NA	<50	<100	<100	NA	NA	NA	NA	NA	0
SDUP7	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
SDUP8	0.05-0.3	<25	<50	**100**	**190**	<0.2	<0.5	<1	<3	<1	0
SDUP9	0.05-0.2	<25	<50	**1000**	**1100**	<0.2	<0.5	<1	NA	<1	0
SDUP9 - Lab replicate	0.05-0.2	<25	<50	**1200**	**1400**	<0.2	<0.5	<1	NA	<1	0
SDUP10	0.05-0.4	<25	<50	<100	<100	<0.2	<0.5	<1	NA	<1	0
FCF2	Surface	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FCF1-JKE23	0-0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Number of Samples		76	77	77	77	76	76	76	73	76	77
Maximum Value		<PQL	120	1200	1400	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL

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

TABLE S5
ASBESTOS QUANTIFICATION - FIELD OBSERVATIONS AND LABORATORY RESULTS
HIL-D:Commercial/Industrial

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]	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**					**0.05**			**0.001**			**0.001**											**0.05**	**0.001**
12/10/2021	JKE1	0-0.1	No	10	10,700	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	280514	JKE1	0-0.1	699.65	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
12/10/2021	JKE1	0.1-0.3	NA	-	4,600	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	280514	JKE2	0-0.1	845.14	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
12/10/2021	JKE2	0-0.1	No	10	8,000	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	280514	JKE2	0.1-0.3	865.14	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
12/10/2021	JKE2	0.1-0.3	NA	-	4,000	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	280514	JKE3	0-0.1	722.13	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
13/10/2021	JKE3	0-0.1	No	10	12,100	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	280514	JKE3	0.1-0.2	858.43	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
13/10/2021	JKE3	0.1-0.2	NA	-	4,050	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	280514	JKE4	0-0.1	801.73	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	Crocidolite	–	0.0015	<0.01	<0.001
13/10/2021	JKE4	0-0.1	No	-	5,000	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	280514	JKE5	0.05-0.2	803.07	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
13/10/2021	JKE5	0-0.05	No	-	4,600	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	280514	JKE6	0.05-0.25	526.42	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
12/10/2021	JKE5	0.05-0.2	No	10	6,700	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	280514	JKE6	0.25-0.4	531.98	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
12/10/2021	JKE6	0-0.05	No	-	4,100	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	280875	JKE7	0.04-0.1	875.72	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
12/10/2021	JKE6	0.05-0.25	No	10	8,100	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	280875	JKE8	0-0.1	533.31	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
12/10/2021	JKE6	0.25-0.4	NA	-	5,100	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	280514	JKE9	0-0.1	599.28	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	Chrysotile	–	0.0005	<0.01	<0.001
18/10/2021	JKE7	0.04-0.1	No	-	2,000	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	280514	JKE9	0.35-0.5	705.18	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
18/10/2021	JKE8	0-0.1	Yes	10	10,500	6.7	1.0038	0.0096	No ACM <7mm observed	--	--	No FA observed	--	--	280514	JKE10	0-0.1	391.62	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
18/10/2021	JKE8	0.1-0.5	NA	-	3,500	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	280514	JKE10	0.2-0.5	687.91	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
12/10/2021	JKE9	0-0.1	No	10	10,000	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	280514	JKE11	0-0.1	650.39	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
12/10/2021	JKE9	0.1-0.35	NA	-	3,000	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	280514	JKE11	0.1-0.2	709.21	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
12/10/2021	JKE10	0-0.1	No	10	7,600	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	280514	JKE12	0.1-0.3	505.28	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
12/10/2021	JKE10	0.1-1.0	NA	-	4,000	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	280514	JKE13	0-0.1	678.86	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
14/10/2021	JKE11	0-0.1	No	10	10,700	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	280514	JKE13	0.1-0.3	733.61	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
14/10/2021	JKE11	0.1-0.2	NA	10	8,100	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	280514	JKE14	0-0.1	589.91	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
13/10/2021	JKE12	0-0.1	No	-	5,450	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	280514	JKE14	0.1-0.2	866.03	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
13/10/2021	JKE12	0.1-0.3	NA	10	10,200	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	280514	JKE15	0-0.1	864.14	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
14/10/2021	JKE13	0-0.1	No	10	10,400	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	280514	JKE16	0-0.1	641.73	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
14/10/2021	JKE13	0.1-0.3	NA	10	6,260	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	280514	JKE16	0.3-0.35	765.12	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
13/10/2021	JKE14	0-0.1	No	10	10,050	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	280514	JKE17	0-0.1	716.62	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
13/10/2021	JKE14	0.1-0.2	NA	-	4,500	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	280514	JKE18	0-0.1	759.69	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
14/10/2021	JKE15	0-0.1	No	10	10,650	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	280514	JKE19	0-0.1	738.38	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected	No asbestos detected	<0.1	Chrysotile	–	0.0116	<0.01	0.0016
14/10/2021	JKE15	0.1-0.3	NA	10	10,000	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	280514	JKE19	0.1-0.2	838.17	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
14/10/2021	JKE16	0-0.1	No	10	10,000	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	280875	JKE20	0.05-0.2	1025.81	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
14/10/2021	JKE16	0.1-0.3	NA	10	10,100	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	280875	JKE20	0.2-0.4	655.41	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
14/10/2021	JKE17	0-0.1	No	10	10,100	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	280875	JKE21	0.05-0.2	990.35	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
14/10/2021	JKE17	0.1-0.4	NA	-	2,800	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	280875	JKE21	0.2-0.4	616.16	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
14/10/2021	JKE18	0-0.1	No	10	10,260	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	280875	JKE22	0.05-0.2	1125.01	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
14/10/2021	JKE19	0-0.1	No	10	10,100	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	280875	JKE22	0.2-0.4	865.27	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
14/10/2021	JKE19	0.1-0.2	NA	10	10,000	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	280875	JKE23	0-0.1	862.24	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
19/10/2021	JKE20	0.05-0.2	No	-	2,600	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	280875	JKE23	0.5-0.8	788.69	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
19/10/2021	JKE20	0.2-0.4	NA	-	2,100	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	280875	JKE24	0.04-0.4	1096.04	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
19/10/2021	JKE21	0.05-0.2	No	-	5,200	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	280875	JKE24	0.4-0.6	725.9	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
19/10/2021	JKE21	0.2-0.5	NA	-	2,600	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	280875	JKE25	0.05-0.4	985.82	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
18/10/2021	JKE22	0.05-0.2	No	-	5,900	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	280875	JKE26	0.05-0.3	1126.45	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
18/10/2021	JKE22	0.2-0.4	NA	-	5,000	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	280875	JKE26	0.3-0.5	920.95	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
18/10/2021	JKE23	0-0.1	No	10	13,300	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	280875	JKE27	0-0.1	754.36	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
18/10/2021	JKE23	0.1-0.2	NA	-	2,500	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
18/10/2021	JKE23	0.2-1.2	NA	-	3,800	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
18/10/2021	JKE23	1.2-2.0	NA	10	6,700	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
18/10/2021	JKE24	0.04-0.4	No	10	6,450	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
18/10/2021	JKE24	0.4-0.6	NA	-	4,500	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
19/10/2021	JKE25	0.05-0.4	No	10	7,000	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
19/10/2021	JKE26	0.05-0.3	No	10	6,150	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
19/10/2021	JKE26	0.3-0.5	NA	-	2,050	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
19/10/2021	JKE27	0-0.1	No	10	10,000	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
19/10/2021	JKE27	0.1-0.5	NA	-	4,400	No ACM observed	--	--	No ACM <7mm observed	--	--	No FA observed	--	--	--	--	--	--	--	--	--	--	--	--	--	--
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Concentration above the SAC **VALUE**

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

Land Use Category				COMMERCIAL/INDUSTRIAL																			
							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																				
JKE1	0-0.1	Fill: silty clay	Coarse	5.6	14.1	26	5	15	23	98	13	62	<1	<0.1	<25	<50	110	<100	<0.2	<0.5	<1	<3	0.07
JKE1 - Lab replicate	0-0.1	Fill: silty clay	Coarse	5.6	14.1	26	5	15	20	88	10	74	<1	<0.1	<25	<50	150	160	<0.2	<0.5	<1	<3	0.07
JKE2	0-0.1	Fill: silty sand	Coarse	9.4	9.1	8	<4	3	3	5	3	8	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
JKE2	0.1-0.3	Fill: silty gravelly clay	Coarse	5.6	14.1	26	5	22	18	15	15	32	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	0.6
JKE3	0-0.1	Fill: silty sand	Coarse	9.4	9.1	8	<4	4	4	5	4	12	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
JKE3	0.1-0.2	Fill: silty gravelly clay	Coarse	5.6	14.1	26	9	19	24	18	9	40	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	0.07
JKE4	0-0.1	Fill: silty gravelly sand	Coarse	9.4	9.1	8	<4	27	16	18	12	30	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	0.1
JKE5	0.05-0.2	Fill: silty gravelly clay	Coarse	5.6	14.1	26	8	11	39	15	13	55	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
JKE6	0.05-0.25	Fill: silty sand	Coarse	9.4	9.1	8	5	13	23	14	9	63	<1	<0.1	<25	95	1000	400	<0.2	<0.5	<1	<3	0.05
JKE6	0.25-0.4	Fill: silty clay	Coarse	5.6	14.1	26	6	17	40	15	27	61	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	0.1
JKE7	0.04-0.1	Fill: silty gravelly sand	Coarse	9.4	9.1	8	<4	15	54	1	140	46	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
JKE7 - Lab replicate	0.04-0.1	Fill: silty gravelly sand	Coarse	9.4	9.1	8	<4	18	57	1	140	49	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
JKE7	0.1-0.3	Silty clay	Coarse	5.6	14.1	26	7	14	15	8	5	16	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
JKE8	0-0.1	Fill: silty sandy clay	Coarse	5.6	14.1	26	8	15	37	18	7	93	<1	<0.1	<25	<50	140	<100	<0.2	<0.5	<1	<3	<0.05
JKE9	0-0.1	Fill: silty clayey sand	Coarse	9.4	9.1	8	6	18	91	92	14	300	<1	<0.1	<25	<50	200	100	<0.2	<0.5	<1	<3	0.1
JKE9 - Lab replicate	0-0.1	Fill: silty clayey sand	Coarse	9.4	9.1	8	6	19	88	96	16	230	<1	<0.1	<25	<50	240	120	<0.2	<0.5	<1	<3	0.07
JKE9	0.35-0.5	Fill: silty sandy clay	Coarse	5.6	14.1	26	4	51	21	26	30	50	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
JKE10	0-0.1	Fill: silty clayey sand	Coarse	9.4	9.1	8	5	12	57	59	10	150	<1	<0.1	<25	<50	870	400	<0.2	<0.5	<1	<3	0.05
JKE10	0.2-0.5	Fill: silty gravelly clay	Coarse	5.6	14.1	26	5	20	26	16	8	47	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
JKE10	1.0-1.1	Silty clay	Coarse	5.6	14.1	26	<4	13	14	8	4	16	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
JKE11	0-0.1	Fill: silty clayey sand	Coarse	9.4	9.1	8	<4	10	13	17	6	45	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
JKE11	0.1-0.2	Fill: silty clay	Coarse	5.6	14.1	26	5	14	16	14	5	22	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
JKE11	0.2-0.3	Silty clay	Coarse	5.6	14.1	26	<4	20	17	12	10	17	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
JKE12	0.1-0.3	Fill: silty sand	Coarse	9.4	9.1	8	7	41	22	24	14	73	<1	<0.1	<25	<50	240	<100	<0.2	<0.5	<1	<3	<0.05
JKE13	0-0.1	Fill: silty sand	Coarse	9.4	9.1	8	5	9	21	18	22	100	<1	<0.1	<25	56	360	130	<0.2	<0.5	<1	<3	<0.05
JKE13	0.1-0.3	Fill: silty gravelly clay	Coarse	5.6	14.1	26	5	16	24	18	28	36	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
JKE13	0.3-0.4	Silty clay	Coarse	9.4	9.1	8	4	8	30	11	5	17	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
JKE14	0-0.1	Fill: silty clayey sand	Coarse	9.4	9.1	8	4	8	17	17	20	86	<1	<0.1	<25	<50	340	120	<0.2	<0.5	<1	<3	<0.05
JKE14	0.1-0.2	Fill: silty gravelly clay	Coarse	5.6	14.1	26	5	13	25	15	23	33	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
JKE14 - Lab replicate	0.1-0.2	Fill: silty gravelly clay	Coarse	5.6	14.1	26	5	14	24	17	22	34	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
JKE15	0-0.1	Fill: silty sandy clay	Coarse	5.6	14.1	26	6	17	21	27	11	55	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	0.06
JKE15	0.3-0.35	Silty clay	Coarse	5.6	14.1	26	<4	6	17	7	3	12	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
JKE16	0-0.1	Fill: silty sand	Coarse	9.4	9.1	8	7	15	29	78	14	120	<1	<0.1	<25	<50	140	120	<0.2	<0.5	<1	<3	0.1
JKE16	0.3-0.35	Fill: silty clayey sand	Coarse	9.4	9.1	8	11	18	16	16	7	27	<1	<0.1	<25	120	160	<100	<0.2	<0.5	<1	<3	<0.05
JKE17	0-0.1	Fill: silty gravelly clay	Coarse	5.6	14.1	26	6	17	22	18	8	40	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
JKE18	0-0.1	Fill: silty sandy clay	Coarse	5.6	14.1	26	5	13	19	16	8	44	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
JKE18 - Lab replicate	0-0.1	Fill: silty sandy clay	Coarse	5.6	14.1	26	4	13	19	17	9	45	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
JKE18	0.1-0.3	Silty clay	Coarse	5.6	14.1	26	<4	15	35	12	11	42	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
JKE19	0-0.1	Fill: silty sand	Coarse	9.4	9.1	8	<4	6	17	30	4	56	<1	<0.1	<25	<50	120	<100	<0.2	<0.5	<1	<3	<0.05
JKE19	0.1-0.2	Fill: silty sand	Coarse	9.4	9.1	8	<4	7	13	22	5	43	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
JKE19	0.3-0.5	Silty clay	Coarse	5.6	14.1	26	<4	13	35	12	11	46	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
JKE20	0.05-0.2	Fill: silty gravelly sand	Coarse	9.4	9.1	8	<4	32	83	4	71	46	<1	<0.1	<25	<50	300	570	<0.2	<0.5	<1	<3	0.4
JKE20	0.2-0.4	Fill: silty clay	Coarse	5.6	14.1	26	5	21	41	14	24	62	<1	<0.1	<25	<50	<100	140	<0.2	<0.5	<1	<3	0.06
JKE20	0.5-0.95	Silty clay	Coarse	5.6	14.1	26	<4	4	7	5	2	11	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
JKE21	0.05-0.2	Fill: silty gravelly sand	Coarse	9.4	9.1	8	<4	67	20	4	27	31	<1	<0.1	<25	<50	780	930	<0.2	<0.5	<1	<3	<0.05
JKE21	0.2-0.4	Fill: silty clayey sand	Coarse	9.4	9.1	8	<4	15	8	7	12	15	<1	<0.1	<25	<50	110	150	<0.2	<0.5	<1	<3	<0.05
JKE21	0.5-0.95	Silty clay	Coarse	5.6	14.1	26	<4	8	15	7	3	13	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
JKE22	0.05-0.2	Fill: silty gravelly sand	Coarse	9.4	9.1	8	<4	13	87	3	42	30	<1	<0.1	<25	<50	160	140	<0.2	<0.5	<1	<3	<0.05
JKE22	0.2-0.4	Fill: silty sandy gravel	Coarse	9.4	9.1	8	<4	6	8	6	5	12	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
JKE22 - Lab replicate	0.2-0.4	Fill: silty sandy gravel	Coarse	9.4	9.1	8	<4	7	7	7	5	13	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
JKE22	0.5-0.95	Silty clay	Coarse	5.6	14.1	26	<4	8	11	6	3	17	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
JKE23	0-0.1	Fill: silty sandy clay	Coarse	5.6	14.1	26	<4	7	15	8	5	22	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
JKE23	0.5-0.8	Fill: silty clay	Coarse	5.6	14.1	26	5	13	17	12	5	22	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
JKE23	2.3-2.5	Silty clay	Coarse	5.6	14.1	26	<4	12	17	15	2	11	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
JKE24	0.04-0.4	Fill: silty gravelly sand	Coarse	9.4	9.1	8	<4	11	82	2	130	35	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
JKE24	0.4-0.6	Fill: silty gravelly clay	Coarse	5.6	14.1	26	9	12	17	18	18	17	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
JKE24	0.8-1.0	Silty clay	Coarse	5.6	14.1	26	13	13	24	23	10	48	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
JKE25	0.05-0.4	Fill: silty gravelly clay	Coarse	5.6	14.1	26	<4	14	47	4	110	38	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
JKE25	0.6-0.8	Silty clay	Coarse	5.6	14.1	26	6	14	21	10	5	17	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
JKE26	0.05-0.3	Fill: silty sand	Coarse	9.4	9.1	8	<4	12	10	19	5	31	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
JKE26 - Lab replicate	0.05-0.3	Fill: silty sand	Coarse	9.4	9.1	8	<4	18	12	20	4	27	<1	<0.1	<25	<50	<100	110	<0.2	<0.5	<1	<3	0.06
JKE26 - Lab triplicate	0.05-0.3	Fill: silty sand	Coarse	9.4	9.1	8	<4	13	12	23	4	27	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
JKE26	0.3-0.5	Fill: silty clayey sand	Coarse	9.4	9.1	8	4	17	13	33	8	32	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
JKE26	0.8-1.0	Silty clay	Coarse	5.6	14.1	26	<4	8	15	8	2	13	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
JKE27	0-0.1	Fill: silty sandy clay	Coarse	5.6	14.1	26	7	17	16	27	6	38	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	0.06
JKE27	0.8-1.0	Silty clay	Coarse	5.6	14.1	26	8	18	13	16	3	16	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
SDUP1	0-0.1	Fill: silty clayey sand	Coarse	9.4	9.1	8	12	20	96	100	15	210	<1	<0.1	<25	<50	260	130	<0.2	<0.5	<1	<3	0.05
SDUP2	0-0.1	Fill: silty clay	Coarse	5.6	14.1	26	6	18	18	70	10	62	<1	<0.1	<25	<50	190	170	<0.2	<0.5	<1	<3	0.1
SDUP3	0.05-0.2	Fill: silty gravelly sand	Coarse	9.4	9.1	8	<4	12	110	3	43	34	<1	<0.1	<25	<50	230	180	<0.2	<0.5	<1	<3	<0.05
SDUP4	0.1-0.2	Fill: silty sand	Coarse	9.4	9.1	8	6	15	24	27	15	81	<1	<0.1	<25	<50	150	<100	<0.2	<0.5	<1	<3	<0.05
SDUP5	0-0.1	Fill: silty sandy clay	Coarse	5.6	14.1	26	5	12	21	21	9	50	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	0.07
SDUP6	0-0.1	Fill: silty sandy clay	Coarse	5.6	14.1	26	5	15	19	17	9	50	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
SDUP6 - Lab replicate	0-0.1	Fill: silty sandy clay	Coarse	5.6	14.1	26	NA	NA	NA	NA	NA	NA	NA	<0.1	NA	<50	<100	<100	NA	NA	NA	NA	<0.05
SDUP7	0-0.1	Fill: silty clayey sand	Coarse	9.4	9.1	8	<4	9	13	16	5	43	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
SDUP8	0.05-0.3	Fill: silty sand	Coarse	9.4	9.1	8	<4	18	17	18	4	28	<1	<0.1	<25	<50	100	190	<0.2	<0.5	<1	<3	0.08
SDUP9	0.05-0.2	Fill: silty gravelly sand	Coarse	9.4	9.1	8	6	75	24	9	30	33	<1	<0.4	<25	<50	1000	1100	<0.2	<0.5	<1	NA	<0.2
SDUP9 - Lab replicate	0.05-0.2	Fill: silty gravelly sand	Coarse	9.4	9.1	8	6	78	24	9	29	31	<1	<0.4	<25	<50	1200	1400	<0.2	<0.5	<1	NA	<0.2
SDUP10	0.05-0.4	Fill: silty gravelly clay	Coarse	5.6	14.1	26	6	20	55	10	110	44	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	NA	<0.05
FCF2	Surface	FCF		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FCF1-JKE23	0-0.1	FCF		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Number of Samples				78	78	78	77	77	77	77	77	77	76	62	76	77	77	77	76	76	76	73	77
Maximum Value				9.4	14.1	26	13	78	110	100	140	300	<PQL	<PQL	<PQL	120	1200	1400	<PQL	<PQL	<PQL	<PQL	0.6

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
JKE1	0-0.1	Fill: silty clay	Coarse	5.6	14.1	26	160	670	310	2000	460	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE1 - Lab replicate	0-0.1	Fill: silty clay	Coarse	5.62	14.1	26	160	670	310	2000	460	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE2	0-0.1	Fill: silty sand	Coarse	9.4	9.1	8	160	670	310	2000	300	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE2	0.1-0.3	Fill: silty gravelly clay	Coarse	5.62	14.1	26	160	670	310	2000	460	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE3	0-0.1	Fill: silty sand	Coarse	9.4	9.1	8	160	670	310	2000	300	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE3	0.1-0.2	Fill: silty gravelly clay	Coarse	5.62	14.1	26	160	670	310	2000	460	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE4	0-0.1	Fill: silty gravelly sand	Coarse	9.4	9.1	8	160	670	310	2000	300	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE5	0.05-0.2	Fill: silty gravelly clay	Coarse	5.62	14.1	26	160	670	310	2000	460	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE6	0.05-0.25	Fill: silty sand	Coarse	9.4	9.1	8	160	670	310	2000	300	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE6	0.25-0.4	Fill: silty clay	Coarse	5.62	14.1	26	160	670	310	2000	460	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE7	0.04-0.1	Fill: silty gravelly sand	Coarse	9.4	9.1	8	160	670	310	2000	300	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE7 - Lab replicate	0.04-0.1	Fill: silty gravelly sand	Coarse	9.4	9.1	8	160	670	310	2000	300	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE7	0.1-0.3	Silty clay	Coarse	5.62	14.1	26	160	670	310	2000	460	740	370	--	215	170	1700	3300	75	135	165	180	72
JKE8	0-0.1	Fill: silty sandy clay	Coarse	5.62	14.1	26	160	670	310	2000	460	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE9	0-0.1	Fill: silty clayey sand	Coarse	9.4	9.1	8	160	670	310	2000	300	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE9 - Lab replicate	0-0.1	Fill: silty clayey sand	Coarse	9.4	9.1	8	160	670	310	2000	300	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE9	0.35-0.5	Fill: silty sandy clay	Coarse	5.62	14.1	26	160	670	310	2000	460	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE10	0-0.1	Fill: silty clayey sand	Coarse	9.4	9.1	8	160	670	310	2000	300	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE10	0.2-0.5	Fill: silty gravelly clay	Coarse	5.62	14.1	26	160	670	310	2000	460	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE10	1.0-1.1	Silty clay	Coarse	5.62	14.1	26	160	670	310	2000	460	740	370	--	215	170	1700	3300	75	135	165	180	72
JKE11	0-0.1	Fill: silty clayey sand	Coarse	9.4	9.1	8	160	670	310	2000	300	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE11	0.1-0.2	Fill: silty clay	Coarse	5.62	14.1	26	160	670	310	2000	460	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE11	0.2-0.3	Silty clay	Coarse	5.62	14.1	26	160	670	310	2000	460	740	370	--	215	170	1700	3300	75	135	165	180	72
JKE12	0.1-0.3	Fill: silty sand	Coarse	9.4	9.1	8	160	670	310	2000	300	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE13	0-0.1	Fill: silty sand	Coarse	9.4	9.1	8	160	670	310	2000	300	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE13	0.1-0.3	Fill: silty gravelly clay	Coarse	5.62	14.1	26	160	670	310	2000	460	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE13	0.3-0.4	Silty clay	Coarse	9.4	9.1	8	160	670	310	2000	300	740	370	--	215	170	1700	3300	75	135	165	180	72
JKE14	0-0.1	Fill: silty clayey sand	Coarse	9.4	9.1	8	160	670	310	2000	300	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE14	0.1-0.2	Fill: silty gravelly clay	Coarse	5.62	14.1	26	160	670	310	2000	460	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE14 - Lab replicate	0.1-0.2	Fill: silty gravelly clay	Coarse	5.62	14.1	26	160	670	310	2000	460	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE15	0-0.1	Fill: silty sandy clay	Coarse	5.62	14.1	26	160	670	310	2000	460	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE15	0.3-0.35	Silty clay	Coarse	5.62	14.1	26	160	670	310	2000	460	740	370	--	215	170	1700	3300	75	135	165	180	72
JKE16	0-0.1	Fill: silty sand	Coarse	9.4	9.1	8	160	670	310	2000	300	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE16	0.3-0.35	Fill: silty clayey sand	Coarse	9.4	9.1	8	160	670	310	2000	300	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE17	0-0.1	Fill: silty gravelly clay	Coarse	5.62	14.1	26	160	670	310	2000	460	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE18	0-0.1	Fill: silty sandy clay	Coarse	5.62	14.1	26	160	670	310	2000	460	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE18 - Lab replicate	0-0.1	Fill: silty sandy clay	Coarse	5.62	14.1	26	160	670	310	2000	460	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE18	0.1-0.3	Silty clay	Coarse	5.62	14.1	26	160	670	310	2000	460	740	370	--	215	170	1700	3300	75	135	165	180	72
JKE19	0-0.1	Fill: silty sand	Coarse	9.4	9.1	8	160	670	310	2000	300	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE19	0.1-0.2	Fill: silty sand	Coarse	9.4	9.1	8	160	670	310	2000	300	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE19	0.3-0.5	Silty clay	Coarse	5.62	14.1	26	160	670	310	2000	460	740	370	--	215	170	1700	3300	75	135	165	180	72
JKE20	0.05-0.2	Fill: silty gravelly sand	Coarse	9.4	9.1	8	160	670	310	2000	300	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE20	0.2-0.4	Fill: silty clay	Coarse	5.62	14.1	26	160	670	310	2000	460	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE20	0.5-0.95	Silty clay	Coarse	5.62	14.1	26	160	670	310	2000	460	740	370	--	215	170	1700	3300	75	135	165	180	72
JKE21	0.05-0.2	Fill: silty gravelly sand	Coarse	9.4	9.1	8	160	670	310	2000	300	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE21	0.2-0.4	Fill: silty clayey sand	Coarse	9.4	9.1	8	160	670	310	2000	300	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE21	0.5-0.95	Silty clay	Coarse	5.62	14.1	26	160	670	310	2000	460	740	370	--	215	170	1700	3300	75	135	165	180	72
JKE22	0.05-0.2	Fill: silty gravelly sand	Coarse	9.4	9.1	8	160	670	310	2000	300	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE22	0.2-0.4	Fill: silty sandy gravel	Coarse	9.4	9.1	8	160	670	310	2000	300	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE22 - Lab replicate	0.2-0.4	Fill: silty sandy gravel	Coarse	9.4	9.1	8	160	670	310	2000	300	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE22	0.5-0.95	Silty clay	Coarse	5.62	14.1	26	160	670	310	2000	460	740	370	--	215	170	1700	3300	75	135	165	180	72
JKE23	0-0.1	Fill: silty sandy clay	Coarse	5.62	14.1	26	160	670	310	2000	460	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE23	0.5-0.8	Fill: silty clay	Coarse	5.62	14.1	26	160	670	310	2000	460	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE23	2.3-2.5	Silty clay	Coarse	5.62	14.1	26	160	670	310	2000	460	740	370	--	215	170	1700	3300	75	135	165	180	72
JKE24	0.04-0.4	Fill: silty gravelly sand	Coarse	9.4	9.1	8	160	670	310	2000	300	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE24	0.4-0.6	Fill: silty gravelly clay	Coarse	5.62	14.1	26	160	670	310	2000	460	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE24	0.8-1.0	Silty clay	Coarse	5.62	14.1	26	160	670	310	2000	460	740	370	--	215	170	1700	3300	75	135	165	180	72
JKE25	0.05-0.4	Fill: silty gravelly clay	Coarse	5.62	14.1	26	160	670	310	2000	460	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE25	0.6-0.8	Silty clay	Coarse	5.62	14.1	26	160	670	310	2000	460	740	370	--	215	170	1700	3300	75	135	165	180	72
JKE26	0.05-0.3	Fill: silty sand	Coarse	9.4	9.1	8	160	670	310	2000	300	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE26 - Lab replicate	0.05-0.3	Fill: silty sand	Coarse	9.4	9.1	8	160	670	310	2000	300	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE26 - Lab triplicate	0.05-0.3	Fill: silty sand	Coarse	9.4	9.1	8	160	670	310	2000	300	740	--	--	--	--	--	--	--	--	--	--	--
JKE26	0.3-0.5	Fill: silty clayey sand	Coarse	9.4	9.1	8	160	670	310	2000	300	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE26	0.8-1.0	Silty clay	Coarse	5.62	14.1	26	160	670	310	2000	460	740	370	--	215	170	1700	3300	75	135	165	180	72
JKE27	0-0.1	Fill: silty sandy clay	Coarse	5.62	14.1	26	160	670	310	2000	460	740	370	640	215	170	1700	3300	75	135	165	180	72
JKE27	0.8-1.0	Silty clay	Coarse	5.62	14.1	26	160	670	310	2000	460	740	370	--	215	170	1700	3300	75	135	165	180	72
SDUP1	0-0.1	Fill: silty clayey sand	Coarse	9.4	9.1	8	160	670	310	2000	300	740	370	640	215	170	1700	3300	75	135	165	180	72
SDUP2	0-0.1	Fill: silty clay	Coarse	5.62	14.1	26	160	670	310	2000	460	740	370	640	215	170	1700	3300	75	135	165	180	72
SDUP3	0.05-0.2	Fill: silty gravelly sand	Coarse	9.4	9.1	8	160	670	310	2000	300	740	370	640	215	170	1700	3300	75	135	165	180	72
SDUP4	0.1-0.2	Fill: silty sand	Coarse	9.4	9.1	8	160	670	310	2000	300	740	370	640	215	170	1700	3300	75	135	165	180	72
SDUP5	0-0.1	Fill: silty sandy clay	Coarse	5.62	14.1	26	160	670	310	2000	460	740	370	640	215	170	1700	3300	75	135	165	180	72
SDUP6	0-0.1	Fill: silty sandy clay	Coarse	5.62	14.1	26	160	670	310	2000	460	740	370	640	215	170	1700	3300	75	135	165	180	72
SDUP6 - Lab replicate	0-0.1	Fill: silty sandy clay	Coarse	5.62	14.1	26	--	--	--	--	--	--	--	640	--	170	1700	3300	--	--	--	--	72
SDUP7	0-0.1	Fill: silty clayey sand	Coarse	9.4	9.1	8	160	670	310	2000	300	740	370	640	215	170	1700	3300	75	135	165	180	72
SDUP8	0.05-0.3	Fill: silty sand	Coarse	9.4	9.1	8	160	670	310	2000	300	740	370	640	215	170	1700	3300	75	135	165	180	72
SDUP9	0.05-0.2	Fill: silty gravelly sand	Coarse	9.4	9.1	8	160	670	310	2000	300	740	370	640	215	170	1700	3300	75	135	165	--	72
SDUP9 - Lab replicate	0.05-0.2	Fill: silty gravelly sand	Coarse	9.4	9.1	8	160	670	310	2000	300	740	370	640	215	170	1700	3300	75	135	165	--	72
SDUP10	0.05-0.4	Fill: silty gravelly clay	Coarse	5.62	14.1	26	160	670	310	2000	460	740	370	640	215	170	1700	3300	75	135	165	--	72
FCF2	Surface	FCF		NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
FCF1-JKE23	0-0.1	FCF		NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

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**																									
JKE1	0-0.1	Fill: silty clay	**5**	<0.4	**15**	**23**	**98**	<0.1	**13**	**62**	**0.4**	**0.07**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	**110**	**110**	<0.2	<0.5	<1	<3	Not Detected
JKE1 - Lab replicate	0-0.1	Fill: silty clay	**5**	<0.4	**15**	**20**	**88**	<0.1	**10**	**74**	**0.4**	**0.07**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	**160**	**160**	<0.2	<0.5	<1	<3	NA
JKE2	0-0.1	Fill: silty sand	<4	<0.4	**3**	**3**	5	<0.1	**3**	**8**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	Not Detected
JKE2	0.1-0.3	Fill: silty gravelly clay	**5**	<0.4	**22**	**18**	**15**	<0.1	**15**	**32**	**9.1**	**0.6**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	Not Detected
JKE3	0-0.1	Fill: silty sand	<4	<0.4	**4**	**4**	5	<0.1	**4**	**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	<3	Not Detected
JKE3	0.1-0.2	Fill: silty gravelly clay	**9**	<0.4	**19**	**24**	**18**	<0.1	**9**	**40**	**0.3**	**0.07**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	Not Detected
JKE4	0-0.1	Fill: silty gravelly sand	<4	<0.4	**27**	**16**	**18**	<0.1	**12**	**30**	**1.5**	**0.1**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	Detected
JKE5	0.05-0.2	Fill: silty gravelly clay	**8**	<0.4	**11**	**39**	**15**	<0.1	**13**	**55**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	Not Detected
JKE6	0.05-0.25	Fill: silty sand	**5**	<0.4	**13**	**23**	**14**	<0.1	**9**	**63**	**0.05**	**0.05**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	**460**	**810**	**1270**	<0.2	<0.5	<1	<3	Not Detected
JKE6	0.25-0.4	Fill: silty clay	**6**	<0.4	**17**	**40**	**15**	<0.1	**27**	**61**	**1.1**	**0.1**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	Not Detected
JKE7	0.04-0.1	Fill: silty gravelly sand	<4	<0.4	**15**	**54**	**1**	<0.1	**140**	**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	<3	Not Detected
JKE7 - Lab replicate	0.04-0.1	Fill: silty gravelly sand	<4	<0.4	**18**	**57**	**1**	<0.1	**140**	**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	<3	NA
JKE7	0.1-0.3	Silty clay	**7**	<0.4	**14**	**15**	**8**	<0.1	**5**	**16**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	NA
JKE8	0-0.1	Fill: silty sandy clay	**8**	<0.4	**15**	**37**	**18**	<0.1	**7**	**93**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	**130**	**130**	<0.2	<0.5	<1	<3	Not Detected
JKE9	0-0.1	Fill: silty clayey sand	**6**	<0.4	**18**	**91**	**92**	**0.1**	**14**	**300**	**0.56**	**0.1**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	**150**	**150**	<0.2	<0.5	<1	<3	Detected
JKE9 - Lab replicate	0-0.1	Fill: silty clayey sand	**6**	<0.4	**19**	**88**	**96**	**0.1**	**16**	**230**	**0.74**	**0.07**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	**120**	**170**	**290**	<0.2	<0.5	<1	<3	NA
JKE9	0.35-0.5	Fill: silty sandy clay	**4**	<0.4	**51**	**21**	**26**	<0.1	**30**	**50**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	Not Detected
JKE10	0-0.1	Fill: silty clayey sand	**5**	<0.4	**12**	**57**	**59**	<0.1	**10**	**150**	**0.05**	**0.05**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	**540**	**530**	**1070**	<0.2	<0.5	<1	<3	Not Detected
JKE10	0.2-0.5	Fill: silty gravelly clay	**5**	<0.4	**20**	**26**	**16**	<0.1	**8**	**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	<3	Not Detected
JKE10	1.0-1.1	Silty clay	<4	<0.4	**13**	**14**	**8**	<0.1	**4**	**16**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	NA
JKE11	0-0.1	Fill: silty clayey sand	<4	<0.4	**10**	**13**	**17**	<0.1	**6**	**45**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	Not Detected
JKE11	0.1-0.2	Fill: silty clay	**5**	<0.4	**14**	**16**	**14**	<0.1	**5**	**22**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	Not Detected
JKE11	0.2-0.3	Silty clay	<4	<0.4	**20**	**17**	**12**	<0.1	**10**	**17**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	NA
JKE12	0.1-0.3	Fill: silty sand	**7**	<0.4	**41**	**22**	**24**	<0.1	**14**	**73**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	**210**	**210**	<0.2	<0.5	<1	<3	Not Detected
JKE13	0-0.1	Fill: silty sand	**5**	<0.4	**9**	**21**	**18**	<0.1	**22**	**100**	**1.5**	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	**200**	**260**	**460**	<0.2	<0.5	<1	<3	Not Detected
JKE13	0.1-0.3	Fill: silty gravelly clay	**5**	<0.4	**16**	**24**	**18**	<0.1	**28**	**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	<3	Not Detected
JKE13	0.3-0.4	Silty clay	**4**	<0.4	**8**	**30**	**11**	<0.1	**5**	**17**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	NA
JKE14	0-0.1	Fill: silty clayey sand	**4**	<0.4	**8**	**17**	**17**	<0.1	**20**	**86**	**1.8**	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	**160**	**260**	**420**	<0.2	<0.5	<1	<3	Not Detected
JKE14	0.1-0.2	Fill: silty gravelly clay	**5**	<0.4	**13**	**25**	**15**	<0.1	**23**	**33**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	Not Detected
JKE14 - Lab replicate	0.1-0.2	Fill: silty gravelly clay	**5**	<0.4	**14**	**24**	**17**	<0.1	**22**	**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	<3	NA
JKE15	0-0.1	Fill: silty sandy clay	**6**	<0.4	**17**	**21**	**27**	<0.1	**11**	**55**	**0.3**	**0.06**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	Not Detected
JKE15	0.3-0.35	Silty clay	<4	<0.4	**6**	**17**	**7**	<0.1	**3**	**12**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	NA
JKE16	0-0.1	Fill: silty sand	**7**	<0.4	**15**	**29**	**78**	**0.1**	**14**	**120**	**0.88**	**0.1**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	**110**	**110**	<0.2	<0.5	<1	<3	Not Detected
JKE16	0.3-0.35	Fill: silty clayey sand	**11**	<0.4	**18**	**16**	**16**	<0.1	**7**	**27**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	**240**	<100	**240**	<0.2	<0.5	<1	<3	Not Detected
JKE17	0-0.1	Fill: silty gravelly clay	**6**	<0.4	**17**	**22**	**18**	<0.1	**8**	**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	<3	Not Detected
JKE18	0-0.1	Fill: silty sandy clay	**5**	<0.4	**13**	**19**	**16**	<0.1	**8**	**44**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	Not Detected
JKE18 - Lab replicate	0-0.1	Fill: silty sandy clay	**4**	<0.4	**13**	**19**	**17**	<0.1	**9**	**45**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	NA
JKE18	0.1-0.3	Silty clay	<4	<0.4	**15**	**35**	**12**	<0.1	**11**	**42**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	NA
JKE19	0-0.1	Fill: silty sand	<4	<0.4	**6**	**17**	**30**	<0.1	**4**	**56**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	Detected
JKE19	0.1-0.2	Fill: silty sand	<4	<0.4	**7**	**13**	**22**	<0.1	**5**	**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	<3	Not Detected
JKE19	0.3-0.5	Silty clay	<4	<0.4	**13**	**35**	**12**	<0.1	**11**	**46**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	NA
JKE20	0.05-0.2	Fill: silty gravelly sand	<4	<0.4	**32**	**83**	**4**	<0.1	**71**	**46**	**4**	**0.4**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	**360**	**360**	<0.2	<0.5	<1	<3	Not Detected
JKE20	0.2-0.4	Fill: silty clay	**5**	<0.4	**21**	**41**	**14**	<0.1	**24**	**62**	**0.06**	**0.06**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	Not Detected
JKE20	0.5-0.95	Silty clay	<4	<0.4	**4**	**7**	5	<0.1	**2**	**11**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	NA
JKE21	0.05-0.2	Fill: silty gravelly sand	<4	<0.4	**67**	**20**	**4**	<0.1	**27**	**31**	**0.2**	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	**260**	**770**	**1030**	<0.2	<0.5	<1	<3	Not Detected
JKE21	0.2-0.4	Fill: silty clayey sand	<4	<0.4	**15**	**8**	**7**	<0.1	**12**	**15**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	**110**	**110**	<0.2	<0.5	<1	<3	Not Detected
JKE21	0.5-0.95	Silty clay	<4	<0.4	**8**	**15**	**7**	<0.1	**3**	**13**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	NA
JKE22	0.05-0.2	Fill: silty gravelly sand	<4	<0.4	**13**	**87**	**3**	<0.1	**42**	**30**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	**130**	**130**	<0.2	<0.5	<1	<3	Not Detected
JKE22	0.2-0.4	Fill: silty sandy gravel	<4	<0.4	**6**	**8**	**6**	<0.1	**5**	**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	<3	Not Detected
JKE22 - Lab replicate	0.2-0.4	Fill: silty sandy gravel	<4	<0.4	**7**	**7**	**7**	<0.1	**5**	**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	<3	NA
JKE22	0.5-0.95	Silty clay	<4	<0.4	**8**	**11**	**6**	<0.1	**3**	**17**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	NA
JKE23	0-0.1	Fill: silty sandy clay	<4	<0.4	**7**	**15**	**8**	<0.1	**5**	**22**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	Not Detected
JKE23	0.5-0.8	Fill: silty clay	**5**	<0.4	**13**	**17**	**12**	<0.1	**5**	**22**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	Not Detected
JKE23	2.3-2.5	Silty clay	<4	<0.4	**12**	**17**	**15**	<0.1	**2**	**11**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	NA
JKE24	0.04-0.4	Fill: silty gravelly sand	<4	<0.4	**11**	**82**	**2**	<0.1	**130**	**35**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	Not Detected
JKE24	0.4-0.6	Fill: silty gravelly clay	**9**	<0.4	**12**	**17**	**18**	<0.1	**18**	**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	<3	Not Detected
JKE24	0.8-1.0	Silty clay	**13**	<0.4	**13**	**24**	**23**	<0.1	**10**	**48**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	NA
JKE25	0.05-0.4	Fill: silty gravelly clay	<4	<0.4	**14**	**47**	**4**	<0.1	**110**	**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	<3	Not Detected
JKE25	0.6-0.8	Silty clay	**6**	<0.4	**14**	**21**	**10**	<0.1	**5**	**17**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	NA
JKE26	0.05-0.3	Fill: silty sand	<4	<0.4	**12**	**10**	**19**	**0.1**	**5**	**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	<3	Not Detected
JKE26 - Lab replicate	0.05-0.3	Fill: silty sand	<4	<0.4	**18**	**12**	**20**	**0.1**	**4**	**27**	**0.06**	**0.06**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	NA
JKE26 - Lab triplicate	0.05-0.3	Fill: silty sand	<4	<0.4	**13**	**12**	**23**	**0.1**	**4**	**27**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
JKE26	0.3-0.5	Fill: silty clayey sand	**4**	<0.4	**17**	**13**	**33**	<0.1	**8**	**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	<3	Not Detected
JKE26	0.8-1.0	Silty clay	<4	<0.4	**8**	**15**	**8**	<0.1	**2**	**13**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	NA
JKE27	0-0.1	Fill: silty sandy clay	**7**	<0.4	**17**	**16**	**27**	<0.1	**6**	**38**	**0.2**	**0.06**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	Not Detected
JKE27	0.8-1.0	Silty clay	**8**	<0.4	**18**	**13**	**16**	<0.1	**3**	**16**	<0.05	<0.05	NA	NA	NA	NA	NA	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	NA
SDUP1	0-0.1	Fill: silty clayey sand	**12**	<0.4	**20**	**96**	**100**	**0.2**	**15**	**210**	**0.2**	**0.05**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	**110**	**190**	**300**	<0.2	<0.5	<1	<3	NA
SDUP2	0-0.1	Fill: silty clay	**6**	<0.4	**18**	**18**	**70**	<0.1	**10**	**62**	**0.87**	**0.1**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	**180**	**180**	<0.2	<0.5	<1	<3	NA
SDUP3	0.05-0.2	Fill: silty gravelly sand	<4	<0.4	**12**	**110**	**3**	<0.1	**43**	**34**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	**100**	**170**	**270**	<0.2	<0.5	<1	<3	NA
SDUP4	0.1-0.2	Fill: silty sand	**6**	<0.4	**15**	**24**	**27**	<0.1	**15**	**81**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	**110**	**110**	<0.2	<0.5	<1	<3	NA
SDUP5	0-0.1	Fill: silty sandy clay	**5**	<0.4	**12**	**21**	**21**	<0.1	**9**	**50**	**0.3**	**0.07**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<1	NA
SDUP6	0-0.1	Fill: silty sandy clay	**5**	<0.4	**15**	**19**	**17**	<0.1	**9**	**50**	<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
SDUP6 - Lab replicate	0-0.1	Fill: silty sandy clay	NA	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	NA	<50	<100	<100	<50	NA	NA	NA	NA	NA
SDUP7	0-0.1	Fill: silty clayey sand	<4	<0.4	**9**	**13**	**16**	<0.1	**5**	**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
SDUP8	0.05-0.3	Fill: silty sand	<4	<0.4	**18**	**17**	**18**	**0.1**	**4**	**28**	**0.08**	**0.08**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	**120**	**120**	<0.2	<0.5	<1	<3	NA
SDUP9	0.05-0.2	Fill: silty gravelly sand	**6**	<0.4	**75**	**24**	**9**	<0.1	**30**	**33**	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	**430**	**820**	**1250**	<0.2	<0.5	<1	NA	NA
SDUP9 - Lab replicate	0.05-0.2	Fill: silty gravelly sand	**6**	<0.4	**78**	**24**	**9**	<0.1	**29**	**31**	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<2.5	<25	<50	**450**	**1100**	**1550**	<0.2	<0.5	<1	NA	NA
SDUP10	0.05-0.4	Fill: silty gravelly clay	**6**	<0.4	**20**	**55**	**10**	<0.1	**110**	**44**	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<2.5	<25	<50	<100	<100	<50	<0.2	<0.5	<1	NA	NA
FCF1	Surface	FCF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Detected
FCF2	Surface	FCF	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
FCF1-JKE8	0-0.1	FCF	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Detected
FCF1-JKE23	0-0.1	FCF	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
Total Number of Samples			77	77	77	77	77	77	77	77	77	77	62	62	62	62	62	76	77	77	77	77	76	76	76	73	47
Maximum Value			13	<PQL	78	110	100	0.2	140	300	9.1	0.6	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	540	1100	1550	<PQL	<PQL	<PQL	<PQL	Detected

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

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

			Nickel
PQL - Envirolab Services			0.02
TCLP1 - General Solid Waste			2
TCLP2 - Restricted Solid Waste			8
TCLP3 - Hazardous Waste			>8
Sample Reference	**Sample Depth**	**Sample Description**	
JKE7	0.04-0.1	Fill: silty gravelly sand	**0.1**
JKE20	0.05-0.2	Fill: silty gravelly sand	**0.07**
JKE22	0.05-0.2	Fill: silty gravelly sand	**0.07**
JKE24	0.04-0.4	Fill: silty gravelly sand	**0.2**
JKE25	0.05-0.4	Fill: silty gravelly clay	**0.3**
Total Number of samples			5
Maximum Value			0.3

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

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	JKE9	0-0.1	<25	<50	200	100	<0.2	<0.5	<1	<2	<1
laboratory	SDUP1	0-0.1	<25	<50	260	130	<0.2	<0.5	<1	<2	<1
duplicate	MEAN		nc	nc	230	115	nc	nc	nc	nc	nc
	RPD %		nc	nc	26%	26%	nc	nc	nc	nc	nc
Intra	JKE1	0-0.1	<25	<50	110	<100	<0.2	<0.5	<1	<2	<1
laboratory	SDUP2	0-0.1	<25	<50	190	170	<0.2	<0.5	<1	<2	<1
duplicate	MEAN		nc	nc	150	110	nc	nc	nc	nc	nc
	RPD %		nc	nc	53%	109%	nc	nc	nc	nc	nc
Intra	JKE22	0.05-0.2	<25	<50	160	140	<0.2	<0.5	<1	<2	<1
laboratory	SDUP3	0.05-0.2	<25	<50	230	180	<0.2	<0.5	<1	<2	<1
duplicate	MEAN		nc	nc	195	160	nc	nc	nc	nc	nc
	RPD %		nc	nc	36%	25%	nc	nc	nc	nc	nc
Intra	JKE12	0.1-0.3	<25	<50	240	<100	<0.2	<0.5	<1	<2	<1
laboratory	SDUP4	0.1-0.2	<25	<50	150	<100	<0.2	<0.5	<1	<2	<1
duplicate	MEAN		nc	nc	195	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	46%	nc	nc	nc	nc	nc	nc
Intra	JKE26	0.05-0.3	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1
laboratory	SDUP8	0.05-0.3	<25	<50	100	190	<0.2	<0.5	<1	<2	<1
duplicate	MEAN		nc	nc	75	120	nc	nc	nc	nc	nc
	RPD %		nc	nc	67%	117%	nc	nc	nc	nc	nc
Inter	JKE15	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1
laboratory	SDUP5	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	JKE18	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1
laboratory	SDUP6	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	JKE11	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1
laboratory	SDUP7	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	JKE21	0.05-0.2	<25	<50	780	930	<0.2	<0.5	<1	<2	<1
laboratory	SDUP9	0.05-0.2	<25	<50	1000	1100	<0.2	<0.5	<1	<2	<1
duplicate	MEAN		nc	nc	890	1015	nc	nc	nc	nc	nc
	RPD %		nc	nc	25%	17%	nc	nc	nc	nc	nc
Inter	JKE25	0.05-0.4	<25	<50	<100	<100	<0.2	<0.5	<1	<2	<1
laboratory	SDUP10	0.05-0.4	<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	TBS1		NA	NA	NA	NA	<0.2	<0.5	<1	<2	<1
Blank	12/10/21										
Trip	TSS1		-	-	-	-	100%	100%	100%	100%	100%
Spike	12/10/21										
Field	TBS2		NA	NA	NA	NA	<0.2	<0.5	<1	<2	<1
Blank	13/10/21										
Trip	TSS2		-	-	-	-	108%	104%	104%	84%	96%
Spike	13/10/21										
Field	TBS3		<25	NA	NA	NA	<0.2	<0.5	<1	<2	<1
Blank	18/10/21										
Trip	TSS3		-	-	-	-	120%	117%	112%	112%	115%
Spike	18/10/21										
Field	FR1soilHA	µg/L	<10	<50	<100	<100	<1	<1	<1	<2	<1
Rinsate	13/10/21										
Field	FR2soilHA	µg/L	<10	54	<100	<100	<1	<1	<1	<2	<1
Rinsate	18/10/21										

			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	JKE9	0-0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.2	0.1	0.3	<0.1	<0.1
laboratory	SDUP1	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	0.075	0.125	nc	nc	0.075	0.175	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	67%	120%	nc	nc	67%	143%	nc	nc
Intra	JKE1	0-0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	0.2	<0.1	<0.1	<0.2	0.07	<0.1	<0.1	<0.1
laboratory	SDUP2	0-0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	0.2	0.2	<0.1	0.1	<0.2	0.1	<0.1	<0.1	0.1
duplicate	MEAN		nc	nc	nc	nc	0.075	nc	0.2	0.2	nc	0.075	nc	0.085	nc	nc	0.075
	RPD %		nc	nc	nc	nc	67%	nc	0%	0%	nc	67%	nc	35%	nc	nc	67%
Intra	JKE22	0.05-0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
laboratory	SDUP3	0.05-0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
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	JKE12	0.1-0.3	<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	SDUP4	0.1-0.2	<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	JKE26	0.05-0.3	<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	SDUP8	0.05-0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	0.08	<0.1	<0.1	<0.1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	0.0525	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	105%	nc	nc	nc
Inter	JKE15	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	0.06	<0.1	<0.1	<0.1
laboratory	SDUP5	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	0.07	<0.1	<0.1	<0.1
duplicate	MEAN		nc	nc	nc	nc	nc	nc	0.1	0.1	nc	nc	nc	0.065	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	0%	0%	nc	nc	nc	15%	nc	nc	nc
Inter	JKE18	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	SDUP6	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	JKE11	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	SDUP7	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	JKE21	0.05-0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1
laboratory	SDUP9	0.05-0.2	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.8	<0.2	<0.4	<0.4	<0.4
duplicate	MEAN		nc	nc	nc	nc	nc	nc	nc	nc	0.125	nc	nc	nc	nc	nc	nc
	RPD %		nc	nc	nc	nc	nc	nc	nc	nc	120%	nc	nc	nc	nc	nc	nc
Inter	JKE25	0.05-0.4	<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	SDUP10	0.05-0.4	<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	TBS1		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Blank	12/10/21																
Trip	TSS1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spike	12/10/21																
Field	TBS2		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Blank	13/10/21																
Trip	TSS2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spike	13/10/21																
Field	TBS3		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Blank	18/10/21																
Trip	TSS3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spike	18/10/21																
Field	FR1soilHA	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	13/10/21																
Field	FR2soilHA	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	18/10/21																

			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	JKE9	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	SDUP1	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
Intra	JKE1	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	SDUP2	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
Intra	JKE22	0.05-0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
laboratory	SDUP3	0.05-0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
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	JKE12	0.1-0.3	<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	SDUP4	0.1-0.2	<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	JKE26	0.05-0.3	<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	SDUP8	0.05-0.3	<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	JKE15	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	SDUP5	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	JKE18	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	SDUP6	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	JKE11	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	SDUP7	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	JKE21	0.05-0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
laboratory	SDUP9	0.05-0.2	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
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	JKE25	0.05-0.4	<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	SDUP10	0.05-0.4	<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	TBS1		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Blank	12/10/21																					
Trip	TSS1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spike	12/10/21																					
Field	TBS2		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Blank	13/10/21																					
Trip	TSS2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spike	13/10/21																					
Field	TBS3		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Blank	18/10/21																					
Trip	TSS3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spike	18/10/21																					
Field	FR1soilHA	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Rinsate	13/10/21																					
Field	FR2soilHA	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Rinsate	18/10/21																					

			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	JKE9	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	SDUP1	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
Intra	JKE1	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	SDUP2	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
Intra	JKE22	0.05-0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
laboratory	SDUP3	0.05-0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
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	JKE12	0.1-0.3	<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	SDUP4	0.1-0.2	<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	JKE26	0.05-0.3	<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	SDUP8	0.05-0.3	<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	JKE15	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	SDUP5	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	JKE18	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	SDUP6	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	JKE11	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	SDUP7	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	JKE21	0.05-0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
laboratory	SDUP9	0.05-0.2	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<2.5
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	JKE25	0.05-0.4	<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	SDUP10	0.05-0.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<2.5
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	TBS1		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Blank	12/10/21														
Trip	TSS1		-	-	-	-	-	-	-	-	-	-	-	-	-
Spike	12/10/21														
Field	TBS2		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Blank	13/10/21														
Trip	TSS2		-	-	-	-	-	-	-	-	-	-	-	-	-
Spike	13/10/21														
Field	TBS3		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Blank	18/10/21														
Trip	TSS3		-	-	-	-	-	-	-	-	-	-	-	-	-
Spike	18/10/21														
Field	FR1soilHA	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Rinsate	13/10/21														
Field	FR2soilHA	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Rinsate	18/10/21														

			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	JKE9	0-0.1	6	<0.4	18	91	92	0.1	14	300
laboratory	SDUP1	0-0.1	12	<0.4	20	96	100	0.2	15	210
duplicate	MEAN		9	nc	19	93.5	96	0.15	14.5	255
	RPD %		67%	nc	11%	5%	8%	67%	7%	35%
Intra	JKE1	0-0.1	5	<0.4	15	23	98	<0.1	13	62
laboratory	SDUP2	0-0.1	6	<0.4	18	18	70	<0.1	10	62
duplicate	MEAN		5.5	nc	16.5	20.5	84	nc	11.5	62
	RPD %		18%	nc	18%	24%	33%	nc	26%	0%
Intra	JKE22	0.05-0.2	<4	<0.4	13	87	3	<0.1	42	30
laboratory	SDUP3	0.05-0.2	<4	<0.4	12	110	3	<0.1	43	34
duplicate	MEAN		nc	nc	12.5	98.5	3	nc	42.5	32
	RPD %		nc	nc	8%	23%	0%	nc	2%	13%
Intra	JKE12	0.1-0.3	7	<0.4	41	22	24	<0.1	14	73
laboratory	SDUP4	0.1-0.2	6	<0.4	15	24	27	<0.1	15	81
duplicate	MEAN		6.5	nc	28	23	25.5	nc	14.5	77
	RPD %		15%	nc	93%	9%	12%	nc	7%	10%
Intra	JKE26	0.05-0.3	<4	<0.4	12	10	19	0.1	5	31
laboratory	SDUP8	0.05-0.3	<4	<0.4	18	17	18	0.1	4	28
duplicate	MEAN		nc	nc	15	13.5	18.5	0.1	4.5	29.5
	RPD %		nc	nc	40%	52%	5%	0%	22%	10%
Inter	JKE15	0-0.1	6	<0.4	17	21	27	<0.1	11	55
laboratory	SDUP5	0-0.1	5	<0.4	12	21	21	<0.1	9	50
duplicate	MEAN		5.5	nc	14.5	21	24	nc	10	52.5
	RPD %		18%	nc	34%	0%	25%	nc	20%	10%
Inter	JKE18	0-0.1	5	<0.4	13	19	16	<0.1	8	44
laboratory	SDUP6	0-0.1	5	<0.4	15	19	17	<0.1	9	50
duplicate	MEAN		5	nc	14	19	16.5	nc	8.5	47
	RPD %		0%	nc	14%	0%	6%	nc	12%	13%
Inter	JKE11	0-0.1	<4	<0.4	10	13	17	<0.1	6	45
laboratory	SDUP7	0-0.1	<4	<0.4	9	13	16	<0.1	5	43
duplicate	MEAN		nc	nc	9.5	13	16.5	nc	5.5	44
	RPD %		nc	nc	11%	0%	6%	nc	18%	5%
Inter	JKE21	0.05-0.2	<4	<0.4	67	20	4	<0.1	27	31
laboratory	SDUP9	0.05-0.2	6	<0.4	75	24	9	<0.1	30	33
duplicate	MEAN		4	nc	71	22	6.5	nc	28.5	32
	RPD %		100%	nc	11%	18%	77%	nc	11%	6%
Inter	JKE25	0.05-0.4	<4	<0.4	14	47	4	<0.1	110	38
laboratory	SDUP10	0.05-0.4	6	<0.4	20	55	10	<0.1	110	44
duplicate	MEAN		4	nc	17	51	7	nc	110	41
	RPD %		100%	nc	35%	16%	86%	nc	0%	15%
Field	TBS1		NA	NA	NA	NA	NA	NA	NA	NA
Blank	12/10/21									
Trip	TSS1		-	-	-	-	-	-	-	-
Spike	12/10/21									
Field	TBS2		NA	NA	NA	NA	NA	NA	NA	NA
Blank	13/10/21									
Trip	TSS2		-	-	-	-	-	-	-	-
Spike	13/10/21									
Field	TBS3		NA	NA	NA	NA	NA	NA	NA	NA
Blank	18/10/21									
Trip	TSS3		-	-	-	-	-	-	-	-
Spike	18/10/21									
Field	FR1soilHA	µg/L	<0.05	<0.01	<0.01	<0.01	<0.03	<0.0005	<0.02	<0.02
Rinsate	13/10/21									
Field	FR2soilHA	µg/L	<0.05	<0.01	<0.01	<0.01	<0.03	<0.0005	<0.02	<0.02
Rinsate	18/10/21									

Result outside of QA/QC acceptance criteria (highlighted)

ABBREVIATIONS AND EXPLANATIONS

Abbreviations used in the Tables:

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

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

	PQL Envirolab Services	ANZG 2018 Fresh Waters	SAMPLES							
			MW22	MW22 - Lab replicate	MW23	MW24	MW24 - lab replicate	MW25	WDUP1	WDUP2
Inorganic Compounds and Parameters										
pH		6.5 - 8.5	7.4	NA	6.5	6.6	NA	NA	NA	NA
Electrical Conductivity (µS/cm)	1	NSL	**30000**	NA	**34000**	**26000**	NA	NA	NA	NA
Turbidity (NTU)		NSL	NA	NA	NA	NA	NA	NA	NA	NA
Metals and Metalloids										
Arsenic (As III)	1	24	**14**	**14**	**4**	<1	NA	**5**	**14**	**4**
Cadmium	0.1	0.2	**0.3**	**0.3**	**3.6**	**1.2**	NA	**1.9**	**0.3**	**3.2**
Chromium (SAC for Cr III adopted)	1	3.3	<1	**1**	<1	<1	NA	**1**	<1	<1
Copper	1	1.4	**2**	**2**	<1	<1	NA	**3**	**2**	**3**
Lead	1	3.4	<1	<1	<1	<1	NA	<1	<1	**1**
Total Mercury (inorganic)	0.05	0.06	<0.05	<0.05	<0.05	<0.05	NA	<0.05	<0.05	<0.05
Nickel	1	11	**40**	**40**	**180**	**43**	NA	**120**	**41**	**190**
Zinc	1	8	**15**	**14**	**200**	**48**	NA	**52**	**15**	**190**
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)										
Benzene	1	950	<1	NA	<1	<1	<1	<1	<1	<1
Toluene	1	180	<1	NA	<1	<1	<1	<1	<1	<1
Ethylbenzene	1	80	<1	NA	<1	<1	<1	<1	<1	<1
m+p-xylene	2	75	<2	NA	<2	<2	<2	<2	<2	<2
o-xylene	1	350	<1	NA	<1	<1	<1	<1	<1	<1
Total xylenes	2	NSL	<2	NA	<2	<2	<2	<2	<2	<2
Volatile Organic Compounds (VOCs), including chlorinated VOCs										
Dichlorodifluoromethane	10	NSL	<10	NA	<10	<10	<10	NA	NA	NA
Chloromethane	10	NSL	<10	NA	<10	<10	<10	NA	NA	NA
Vinyl Chloride	10	100	<10	NA	<10	<10	<10	NA	NA	NA
Bromomethane	10	NSL	<10	NA	<10	<10	<10	NA	NA	NA
Chloroethane	10	NSL	<10	NA	<10	<10	<10	NA	NA	NA
Trichlorofluoromethane	10	NSL	<10	NA	<10	<10	<10	NA	NA	NA
1,1-Dichloroethene	1	700	<1	NA	<1	<1	<1	NA	NA	NA
Trans-1,2-dichloroethene	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
1,1-dichloroethane	1	90	<1	NA	<1	<1	<1	NA	NA	NA
Cis-1,2-dichloroethene	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
Bromochloromethane	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
Chloroform	1	370	<1	NA	<1	**2**	**3**	NA	NA	NA
2,2-dichloropropane	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
1,2-dichloroethane	1	1900	<1	NA	<1	<1	<1	NA	NA	NA
1,1,1-trichloroethane	1	270	<1	NA	<1	<1	<1	NA	NA	NA
1,1-dichloropropene	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
Cyclohexane	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
Carbon tetrachloride	1	240	<1	NA	<1	<1	<1	NA	NA	NA
Benzene	1	950	<1	NA	<1	<1	<1	NA	NA	NA
Dibromomethane	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
1,2-dichloropropane	1	900	<1	NA	<1	<1	<1	NA	NA	NA
Trichloroethene	1	330	<1	NA	<1	<1	<1	NA	NA	NA
Bromodichloromethane	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
trans-1,3-dichloropropene	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
cis-1,3-dichloropropene	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
1,1,2-trichloroethane	1	6500	<1	NA	<1	<1	<1	NA	NA	NA
Toluene	1	180	<1	NA	<1	<1	<1	NA	NA	NA
1,3-dichloropropane	1	1100	<1	NA	<1	<1	<1	NA	NA	NA
Dibromochloromethane	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
1,2-dibromoethane	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
Tetrachloroethene	1	70	<1	NA	<1	<1	<1	NA	NA	NA
1,1,1,2-tetrachloroethane	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
Chlorobenzene	1	55	<1	NA	<1	<1	<1	NA	NA	NA
Ethylbenzene	1	80	<1	NA	<1	<1	<1	NA	NA	NA
Bromoform	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
m+p-xylene	2	75	<2	NA	<2	<2	<2	NA	NA	NA
Styrene	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
1,1,2,2-tetrachloroethane	1	400	<1	NA	<1	<1	<1	NA	NA	NA
o-xylene	1	350	<1	NA	<1	<1	<1	NA	NA	NA
1,2,3-trichloropropane	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
Isopropylbenzene	1	30	<1	NA	<1	<1	<1	NA	NA	NA
Bromobenzene	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
n-propyl benzene	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
2-chlorotoluene	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
4-chlorotoluene	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
1,3,5-trimethyl benzene	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
Tert-butyl benzene	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
1,2,4-trimethyl benzene	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
1,3-dichlorobenzene	1	260	<1	NA	<1	<1	<1	NA	NA	NA
Sec-butyl benzene	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
1,4-dichlorobenzene	1	60	<1	NA	<1	<1	<1	NA	NA	NA
4-isopropyl toluene	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
1,2-dichlorobenzene	1	160	<1	NA	<1	<1	<1	NA	NA	NA
n-butyl benzene	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
1,2-dibromo-3-chloropropane	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
1,2,4-trichlorobenzene	1	85	<1	NA	<1	<1	<1	NA	NA	NA
Hexachlorobutadiene	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
1,2,3-trichlorobenzene	1	3	<1	NA	<1	<1	<1	NA	NA	NA
Polycyclic Aromatic Hydrocarbons (PAHs)										
Naphthalene	0.2	16	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.2	<0.1
Acenaphthylene	0.1	NSL	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Acenaphthene	0.1	NSL	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Fluorene	0.1	NSL	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Phenanthrene	0.1	0.6	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Anthracene	0.1	0.01	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Fluoranthene	0.1	1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Pyrene	0.1	NSL	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Benzo(a)anthracene	0.1	NSL	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Chrysene	0.1	NSL	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	0.2	NSL	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.2	<0.2
Benzo(a)pyrene	0.1	0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	0.1	NSL	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	0.1	NSL	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	0.1	NSL	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	<0.1

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

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

	PQL Envirolab Services	Recreational (10 x NHMRC ADWG)	SAMPLES							
			MW22	MW22 - Lab replicate	MW23	MW24	MW24 - lab replicate	MW25	WDUP1	WDUP2
Inorganic Compounds and Parameters										
pH		6.5 - 8.5	7.4	NA	6.5	6.6	NA	NA	NA	NA
Electrical Conductivity (µS/cm)	1	NSL	**30000**	NA	**34000**	**26000**	NA	NA	NA	NA
Turbidity (NTU)		NSL	NA	NA	NA	NA	NA	NA	NA	NA
Metals and Metalloids										
Arsenic (As III)	1	100	**14**	**14**	**4**	<1	NA	**5**	**14**	**4**
Cadmium	0.1	20	**0.3**	**0.3**	**3.6**	**1.2**	NA	**1.9**	**0.3**	**3.2**
Chromium (total)	1	500	<1	**1**	<1	<1	NA	**1**	<1	<1
Copper	1	20000	**2**	**2**	<1	<1	NA	**3**	**2**	**3**
Lead	1	100	<1	<1	<1	<1	NA	<1	<1	**1**
Total Mercury (inorganic)	0.05	10	<0.05	<0.05	<0.05	<0.05	NA	<0.05	<0.05	<0.05
Nickel	1	200	**40**	**40**	**180**	**43**	NA	**120**	**41**	**190**
Zinc	1	30000	**15**	**14**	**200**	**48**	NA	**52**	**15**	**190**
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)										
Benzene	1	10	<1	NA	<1	<1	<1	<1	<1	<1
Toluene	1	8000	<1	NA	<1	<1	<1	<1	<1	<1
Ethylbenzene	1	3000	<1	NA	<1	<1	<1	<1	<1	<1
m+p-xylene	2	NSL	<2	NA	<2	<2	<2	<2	<2	<2
o-xylene	1	NSL	<1	NA	<1	<1	<1	<1	<1	<1
Total xylenes	2	6000	<2	NA	<2	<2	<2	<2	<2	<2
Volatile Organic Compounds (VOCs), including chlorinated VOCs										
Dichlorodifluoromethane	10	NSL	<10	NA	<10	<10	<10	NA	NA	NA
Chloromethane	10	NSL	<10	NA	<10	<10	<10	NA	NA	NA
Vinyl Chloride	10	3	<10	NA	<10	<10	<10	NA	NA	NA
Bromomethane	10	NSL	<10	NA	<10	<10	<10	NA	NA	NA
Chloroethane	10	NSL	<10	NA	<10	<10	<10	NA	NA	NA
Trichlorofluoromethane	10	NSL	<10	NA	<10	<10	<10	NA	NA	NA
1,1-Dichloroethene	1	300	<1	NA	<1	<1	<1	NA	NA	NA
Trans-1,2-dichloroethene	1	600	<1	NA	<1	<1	<1	NA	NA	NA
1,1-dichloroethane	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
Cis-1,2-dichloroethene	1	600	<1	NA	<1	<1	<1	NA	NA	NA
Bromochloromethane	1	2500	<1	NA	<1	<1	<1	NA	NA	NA
Chloroform	1		<1	NA	<1	**2**	**3**	NA	NA	NA
2,2-dichloropropane	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
1,2-dichloroethane	1	30	<1	NA	<1	<1	<1	NA	NA	NA
1,1,1-trichloroethane	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
1,1-dichloropropene	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
Cyclohexane	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
Carbon tetrachloride	1	30	<1	NA	<1	<1	<1	NA	NA	NA
Benzene	1	10	<1	NA	<1	<1	<1	NA	NA	NA
Dibromomethane	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
1,2-dichloropropane	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
Trichloroethene	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
Bromodichloromethane	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
trans-1,3-dichloropropene	1	1000	<1	NA	<1	<1	<1	NA	NA	NA
cis-1,3-dichloropropene	1	1000	<1	NA	<1	<1	<1	NA	NA	NA
1,1,2-trichloroethane	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
Toluene	1	8000	<1	NA	<1	<1	<1	NA	NA	NA
1,3-dichloropropane	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
Dibromochloromethane	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
1,2-dibromoethane	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
Tetrachloroethene	1	500	<1	NA	<1	<1	<1	NA	NA	NA
1,1,1,2-tetrachloroethane	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
Chlorobenzene	1	3000	<1	NA	<1	<1	<1	NA	NA	NA
Ethylbenzene	1	3000	<1	NA	<1	<1	<1	NA	NA	NA
Bromoform	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
m+p-xylene	2	NSL	<2	NA	<2	<2	<2	NA	NA	NA
Styrene	1	300	<1	NA	<1	<1	<1	NA	NA	NA
1,1,2,2-tetrachloroethane	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
o-xylene	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
1,2,3-trichloropropane	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
Isopropylbenzene	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
Bromobenzene	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
n-propyl benzene	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
2-chlorotoluene	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
4-chlorotoluene	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
1,3,5-trimethyl benzene	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
Tert-butyl benzene	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
1,2,4-trimethyl benzene	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
1,3-dichlorobenzene	1	200	<1	NA	<1	<1	<1	NA	NA	NA
Sec-butyl benzene	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
1,4-dichlorobenzene	1	400	<1	NA	<1	<1	<1	NA	NA	NA
4-isopropyl toluene	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
1,2-dichlorobenzene	1	15000	<1	NA	<1	<1	<1	NA	NA	NA
n-butyl benzene	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
1,2-dibromo-3-chloropropane	1	NSL	<1	NA	<1	<1	<1	NA	NA	NA
1,2,4-trichlorobenzene	1	300	<1	NA	<1	<1	<1	NA	NA	NA
1,2,3-trichlorobenzene	1		<1	NA	<1	<1	<1	NA	NA	NA
Hexachlorobutadiene	1	7	<1	NA	<1	<1	<1	NA	NA	NA
Polycyclic Aromatic Hydrocarbons (PAHs)										
Naphthalene	0.2	NSL	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.2	<0.1
Acenaphthylene	0.1	NSL	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Acenaphthene	0.1	NSL	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Fluorene	0.1	NSL	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Phenanthrene	0.1	NSL	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Anthracene	0.1	NSL	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Fluoranthene	0.1	NSL	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Pyrene	0.1	NSL	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Benzo(a)anthracene	0.1	NSL	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Chrysene	0.1	NSL	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	0.2	NSL	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.2	<0.2
Benzo(a)pyrene	0.1	0.1	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	0.1	NSL	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	0.1	NSL	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	0.1	NSL	<0.1	NA	<0.1	<0.1	NA	<0.1	<0.1	<0.1

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

TABLE G3
GROUNDWATER LABORATORY RESULTS COMPARED TO HSLs
All data in µg/L unless stated otherwise

				C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	PID
PQL - Envirolab Services				10	50	1	1	1	2	1	
NEPM 2013 - Land Use Category				HSL-D: COMMERCIAL/INDUSTRIAL							
Sample Reference	**Water Depth**	**Depth Category**	**Soil Category**								
MW22	6.75	2m to <4m	Sand	<10	<50	<1	<1	<1	<2	<1	3.1
MW22 - Lab replicate	6.75	2m to <4m	Sand	NA	NA	NA	NA	NA	NA	NA	3.1
MW23	5.33	2m to <4m	Sand	<10	<50	<1	<1	<1	<2	<1	4.4
MW24	4.3	2m to <4m	Sand	<10	<50	<1	<1	<1	<2	<1	5.4
MW24 - lab replicate	4.3	2m to <4m	Sand	<10	NA	<1	<1	<1	<2	<1	5.4
MW25	7.06	2m to <4m	Sand	<10	<50	<1	<1	<1	<2	<1	2.6
WDUP1	6.75	2m to <4m	Sand	<10	<50	<1	<1	<1	<2	<1	3.1
WDUP2	5.33	2m to <4m	Sand	<10	<50	<1	<1	<1	<2	<1	4.4
Total Number of Samples				7	6	7	7	7	7	7	8
Maximum Value				<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	5.4

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
MW22	6.75	2m to <4m	Sand	6000	NL	5000	NL	NL	NL	NL
MW22 - Lab replicate	6.75	2m to <4m	Sand	NA	NA	NA	NA	NA	NA	NA
MW23	5.33	2m to <4m	Sand	6000	NL	5000	NL	NL	NL	NL
MW24	4.3	2m to <4m	Sand	6000	NL	5000	NL	NL	NL	NL
MW24 - lab replicate	4.3	2m to <4m	Sand	6000	NA	5000	NL	NL	NL	NL
MW25	7.06	2m to <4m	Sand	6000	NL	5000	NL	NL	NL	NL
WDUP1	6.75	2m to <4m	Sand	6000	NL	5000	NL	NL	NL	NL
WDUP2	5.33	2m to <4m	Sand	6000	NL	5000	NL	NL	NL	NL

TABLE G4
GROUNDWATER LABORATORY RESULTS COMPARED TO SITE SPECIFIC HSLs - RISK ASSESSMENT
All results in µg/L unless stated otherwise.

	PQL Envirolab Services	NHMRC ADWG 2011	WHO 2008	USEPA RSL Tapwater 2017	SAMPLES							
					MW22	MW22 - Lab replicate	MW23	MW24	MW24 - lab replicate	MW25	WDUP1	WDUP2
Total Recoverable Hydrocarbons (TRH)												
C_6-C_9 Aliphatics (assessed using F1)	10	-	15000	-	<10	NA	<10	<10	<10	<10	<10	<10
>C_9-C_{14} Aliphatics (assessed using F2)	50	-	100	-	<50	NA	<50	<50	NA	<50	<50	<50
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)												
Benzene	1	1	-	-	<1	NA	<1	<1	<1	<1	<1	<1
Toluene	1	800	-	-	<1	NA	<1	<1	<1	<1	<1	<1
Ethylbenzene	1	300	-	-	<1	NA	<1	<1	<1	<1	<1	<1
Total xylenes	2	600	-	-	<2	NA	<2	<2	<2	<2	<2	<2
Polycyclic Aromatic Hydrocarbons (PAHs)												
Naphthalene	1	-	-	6.1	<1	NA	<1	<1	<1	<1	<1	<1
Volatile Organic Compounds (VOCs), including chlorinated VOCs												
Dichlorodifluoromethane	10	-	-	-	<10	NA	<10	<10	<10	NA	NA	NA
Chloromethane	10	-	-	-	<10	NA	<10	<10	<10	NA	NA	NA
Vinyl Chloride	10	0.3	-	-	<10	NA	<10	<10	<10	NA	NA	NA
Bromomethane	10	-	-	-	<10	NA	<10	<10	<10	NA	NA	NA
Chloroethane	10	-	-	-	<10	NA	<10	<10	<10	NA	NA	NA
Trichlorofluoromethane	10	-	-	-	<10	NA	<10	<10	<10	NA	NA	NA
1,1-Dichloroethene	1	30	-	-	<1	NA	<1	<1	<1	NA	NA	NA
Trans-1,2-dichloroethene	1	60	-	-	<1	NA	<1	<1	<1	NA	NA	NA
1,1-dichloroethane	1	-	-	-	<1	NA	<1	<1	<1	NA	NA	NA
Cis-1,2-dichloroethene	1	60	-	-	<1	NA	<1	<1	<1	NA	NA	NA
Bromochloromethane	1	250	-	-	<1	NA	<1	<1	<1	NA	NA	NA
Chloroform	1		-	-	<1	NA	<1	**2**	**3**	NA	NA	NA
2,2-dichloropropane	1	-	-	-	<1	NA	<1	<1	<1	NA	NA	NA
1,2-dichloroethane	1	3	-	-	<1	NA	<1	<1	<1	NA	NA	NA
1,1,1-trichloroethane	1	-	-	-	<1	NA	<1	<1	<1	NA	NA	NA
1,1-dichloropropene	1	-	-	-	<1	NA	<1	<1	<1	NA	NA	NA
Cyclohexane	1	-	-	-	<1	NA	<1	<1	<1	NA	NA	NA
Carbon tetrachloride	1	3	-	-	<1	NA	<1	<1	<1	NA	NA	NA
Benzene	1	1	-	-	<1	NA	<1	<1	<1	NA	NA	NA
Dibromomethane	1	-	-	-	<1	NA	<1	<1	<1	NA	NA	NA
1,2-dichloropropane	1	-	-	-	<1	NA	<1	<1	<1	NA	NA	NA
Trichloroethene	1	-	-	-	<1	NA	<1	<1	<1	NA	NA	NA
Bromodichloromethane	1	-	-	-	<1	NA	<1	<1	<1	NA	NA	NA
trans-1,3-dichloropropene	1	100	-	-	<1	NA	<1	<1	<1	NA	NA	NA
cis-1,3-dichloropropene	1	100	-	-	<1	NA	<1	<1	<1	NA	NA	NA
1,1,2-trichloroethane	1	-	-	-	<1	NA	<1	<1	<1	NA	NA	NA
Toluene	1	800	-	-	<1	NA	<1	<1	<1	NA	NA	NA
1,3-dichloropropane	1	-	-	-	<1	NA	<1	<1	<1	NA	NA	NA
Dibromochloromethane	1	-	-	-	<1	NA	<1	<1	<1	NA	NA	NA
1,2-dibromoethane	1	-	-	-	<1	NA	<1	<1	<1	NA	NA	NA
Tetrachloroethene	1	50	-	-	<1	NA	<1	<1	<1	NA	NA	NA
1,1,1,2-tetrachloroethane	1	-	-	-	<1	NA	<1	<1	<1	NA	NA	NA
Chlorobenzene	1	300	-	-	<1	NA	<1	<1	<1	NA	NA	NA
Ethylbenzene	1	300	-	-	<1	NA	<1	<1	<1	NA	NA	NA
Bromoform	1	-	-	-	<1	NA	<1	<1	<1	NA	NA	NA
m+p-xylene	2	-	-	-	<2	NA	<2	<2	<2	NA	NA	NA
Styrene	1	30	-	-	<1	NA	<1	<1	<1	NA	NA	NA
1,1,2,2-tetrachloroethane	1	-	-	-	<1	NA	<1	<1	<1	NA	NA	NA
o-xylene	1	-	-	-	<1	NA	<1	<1	<1	NA	NA	NA
1,2,3-trichloropropane	1	-	-	-	<1	NA	<1	<1	<1	NA	NA	NA
Isopropylbenzene	1	-	-	-	<1	NA	<1	<1	<1	NA	NA	NA
Bromobenzene	1	-	-	-	<1	NA	<1	<1	<1	NA	NA	NA
n-propyl benzene	1	-	-	-	<1	NA	<1	<1	<1	NA	NA	NA
2-chlorotoluene	1	-	-	-	<1	NA	<1	<1	<1	NA	NA	NA
4-chlorotoluene	1	-	-	-	<1	NA	<1	<1	<1	NA	NA	NA
1,3,5-trimethyl benzene	1	-	-	-	<1	NA	<1	<1	<1	NA	NA	NA
Tert-butyl benzene	1	-	-	-	<1	NA	<1	<1	<1	NA	NA	NA
1,2,4-trimethyl benzene	1	-	-	-	<1	NA	<1	<1	<1	NA	NA	NA
1,3-dichlorobenzene	1	20	-	-	<1	NA	<1	<1	<1	NA	NA	NA
Sec-butyl benzene	1	-	-	-	<1	NA	<1	<1	<1	NA	NA	NA
1,4-dichlorobenzene	1	40	-	-	<1	NA	<1	<1	<1	NA	NA	NA
4-isopropyl toluene	1	-	-	-	<1	NA	<1	<1	<1	NA	NA	NA
1,2-dichlorobenzene	1	1500	-	-	<1	NA	<1	<1	<1	NA	NA	NA
n-butyl benzene	1	-	-	-	<1	NA	<1	<1	<1	NA	NA	NA
1,2-dibromo-3-chloropropane	1	-	-	-	<1	NA	<1	<1	<1	NA	NA	NA
1,2,4-trichlorobenzene	1	30	-	-	<1	NA	<1	<1	<1	NA	NA	NA
1,2,3-trichlorobenzene	1		-	-	<1	NA	<1	<1	<1	NA	NA	NA
Hexachlorobutadiene	1	7	-	-	<1	NA	<1	<1	<1	NA	NA	NA

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

TABLE Q2
GROUNDWATER QA/QC SUMMARY

		TRH C6 - C10	TRH >C10-C16	TRH >C16-C34	TRH >C34-C40	Benzene	Toluene	Ethylbenzene	m+p-xylene	o-Xylene	Naphthalene	Acenaphthylene	Acenaph-thene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b,j+k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-c,d)pyrene	Dibenzo(a,h)anthra-cene	Benzo(g,h,i)perylene	Arsenic	Cadmium	Chromium VI	Copper	Lead	Mercury	Nickel	Zinc
	PQL Envirolab SYD	*10*	*50*	*100*	*100*	*1*	*1*	*1*	*2*	*1*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*1*	*0.1*	*1*	*1*	*1*	*0.05*	*1*	*1*
	PQL Envirolab VIC	*10*	*50*	*100*	*100*	*1.0*	*1.0*	*1.0*	*2.0*	*1.0*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*1*	*0.1*	*1*	*1*	*1*	*0.05*	*1*	*1*
Intra	MW22	<10	<50	<100	<100	<1	<1	<1	<2	<1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	14	0.3	<1	2	<1	<0.05	40	15
laboratory	WDUP1	<10	<50	<100	<100	<1	<1	<1	<2	<1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	14	0.3	<1	2	<1	<0.05	41	15
duplicate	MEAN	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	14	0.3	nc	2	nc	nc	40.5	15
	RPD %	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	0%	0%	nc	0%	nc	nc	2%	0%
Inter	MW23	<10	<50	<100	<100	<1	<1	<1	<2	<1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	4	3.6	<1	<1	<1	<0.05	180	200
laboratory	WDUP2	<10	<50	<100	<100	<1	<1	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	4	3.2	<1	3	1	<0.05	190	190
duplicate	MEAN	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	4	3.4	nc	1.75	0.75	nc	185	195
	RPD %	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	nc	0%	12%	nc	143%	67%	nc	5%	5%
Field	TB-W1	<10	81	<100	<100	<1	<1	<1	<2	<1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<1	<1	<1	<0.05	<1	3
Blank	27/10/2021																																
Trip	TS-W1	-	-	-	-	80%	100%	115%	120%	115%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Spike	27/10/2021																																

Result outside of QA/QC acceptance criteria Value

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **JKE1** **1/1**

SDUP2: 0-0.1m

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED 'STAGE 2' DEVELOPMENT

Location: NEPEAN HOSPITAL, DERBY STREET, KINGSWOOD, NSW

Job No.: E34236PL **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 12/10/21 **Datum:** -

Plant Type: - **Logged/Checked by:** H.W./M.D.

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 siltstone gravel, root fibres and ash.	w<PL			GRASS COVER SCREEN: 10.7kg 0-0.1m NO FCF
										END OF BOREHOLE AT 0.3m				SCREEN: 4.6kg 0.1-0.3m NO FCF HAND AUGER REFUSAL
							0.5							
							1							
							1.5							
							2							
							2.5							
							3							
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **JKE2** **1/1**

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED 'STAGE 2' DEVELOPMENT

Location: NEPEAN HOSPITAL, DERBY STREET, KINGSWOOD, NSW

Job No.: E34236PL **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 12/10/21 **Datum:** -

Plant Type: - **Logged/Checked by:** H.W./M.D.

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 sand, fine to medium grained, dark brown, trace of igneous gravel and root fibres.	w<PL			GRASS COVER SCREEN: 8.0kg 0-0.1m NO FCF
										FILL: Silty gravelly clay, low to medium plasticity, yellow brown, fine to medium grained, sub-angular, igneous gravel, trace of siltstone gravel and concrete fragments.				SCREEN: 4.0kg 0.1-0.3m NO FCF
							0.5			END OF BOREHOLE AT 0.3m				HAND AUGER REFUSAL
							1							
							1.5							
							2							
							2.5							
							3							
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **JKE3** **1/1**

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED 'STAGE 2' DEVELOPMENT

Location: NEPEAN HOSPITAL, DERBY STREET, KINGSWOOD, NSW

Job No.: E34236PL **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 13/10/21 **Datum:** -

Plant Type: - **Logged/Checked by:** H.W./M.D.

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 sand, fine to medium grained, dark brown, trace of igneous and sandstone gravel, ceramic and terracotta tile fragments and roots.	M w<PL			GRASS COVER SCREEN: 12.1kg 0-0.1m NO FCF
							0.5			FILL: Silty gravelly clay, low to medium plasticity, yellow brown, fine to medium grained, igneous gravel, trace of ironstone and siltstone gravel and root fibres.				SCREEN: 4.05kg 0.1-0.2m NO FCF
										END OF BOREHOLE AT 0.2m				HAND AUGER REFUSAL
							1							
							1.5							
							2							
							2.5							
							3							
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **JKE4** **1/1**

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED 'STAGE 2' DEVELOPMENT

Location: NEPEAN HOSPITAL, DERBY STREET, KINGSWOOD, NSW

Job No.: E34236PL **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 13/10/21 **Datum:** -

Plant Type: - **Logged/Checked by:** H.W./M.D.

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 gravelly sand, fine to medium grained, light brown, fine to medium grained igneous gravel, trace of sandstone gravel.	M			COMPACTED ROADBASE MATERIAL
										END OF BOREHOLE AT 0.1m				SCREEN: 5.0kg 0-0.1m NO FCF
							0.5							HAND AUGER REFUSAL
							1							
							1.5							
							2							
							2.5							
							3							
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **JKE5** **1/1**

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED 'STAGE 2' DEVELOPMENT

Location: NEPEAN HOSPITAL, DERBY STREET, KINGSWOOD, NSW

Job No.: E34236PL **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 12/10/21 **Datum:** -

Plant Type: - **Logged/Checked by:** H.W./M.D.

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: Mulch, brown, with fine to medium grained sand.	D			SCREEN: 4.6kg 0-0.05m NO FCF
											w<PL			
										FILL: Silty gravelly clay, low to medium plasticity, brown, fine to medium grained, sub-angular, igneous and ironstone gravel, trace of siltstone gravel, and concrete fragments.				SCREEN: 6.7kg 0.05-0.2m NO FCF
							0.5			END OF BOREHOLE AT 0.2m				HAND AUGER REFUSAL
							1							
							1.5							
							2							
							2.5							
							3							
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **JKE6** **1/1**

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED 'STAGE 2' DEVELOPMENT

Location: NEPEAN HOSPITAL, DERBY STREET, KINGSWOOD, NSW

Job No.: E34236PL **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 12/10/21 **Datum:** -

Plant Type: - **Logged/Checked by:** H.W./M.D.

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: Mulch, brown, with fine to medium grained sand.	D			SCREEN: 4.1kg 0-0.05m NO FCF
										FILL: Silty sand, fine to medium grained, brown, trace of igneous gravel and clay nodules.	M			SCREEN: 8.10kg 0.05-0.25m NO FCF
										FILL: Silty clay, medium to high plasticity, light brown, trace of igneous and ironstone gravel, and root fibres.	w≈PL			SCREEN: 5.10kg 0.25-0.4m NO FCF
							0.5			END OF BOREHOLE AT 0.4m				HAND AUGER REFUSAL
							1							
							1.5							
							2							
							2.5							
							3							
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **JKE7** **1/1**

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED 'STAGE 2' DEVELOPMENT

Location: NEPEAN HOSPITAL, DERBY STREET, KINGSWOOD, NSW

Job No.: E34236PL **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 18/10/21 **Datum:** -

Plant Type: - **Logged/Checked by:** H.W./M.D.

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		-	ASPHALTIC CONCRETE: 40mm.t				
									CI-CH	FILL: Silty gravelly sand, fine to medium grained, grey, fine to medium grained, sub-angular, igneous gravel.	M w<PL			SCREEN: 2.0kg 0.04-0.1m NO FCF
							0.5			Silty CLAY: medium to high plasticity, grey mottled orange brown, trace of ironstone gravel.				RESIDUAL
										END OF BROREHOLE AT 0.8m				
							1							
							1.5							
							2							
							2.5							
							3							
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **JKE8** **1/1**

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED 'STAGE 2' DEVELOPMENT

Location: NEPEAN HOSPITAL, DERBY STREET, KINGSWOOD, NSW

Job No.: E34236PL **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 18/10/21 **Datum:** -

Plant Type: - **Logged/Checked by:** H.W./M.D.

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 sandy clay, low to medium plasticity, brown, fine to medium grained sand, trace of igneous gravel, concrete fragments, plastic and root fibres.	w<PL			MULCH COVER SCREEN: 10.5kg 0-0.1m FCF AT 0-0.1m SCREEN: 3.5kg 0.1-0.5m NO FCF
							0.5			END OF BOREHOLE AT 0.5m				HAND AUGER REFUSAL
							1							
							1.5							
							2							
							2.5							
							3							
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **JKE8A** **1/1**

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED 'STAGE 2' DEVELOPMENT

Location: NEPEAN HOSPITAL, DERBY STREET, KINGSWOOD, NSW

Job No.: E34236PL **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 19/10/21 **Datum:** -

Plant Type: - **Logged/Checked by:** H.W./M.D.

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		-	ASPHLTIC CONCRETE: 50mm.t FILL: Silty gravelly sand, fine to medium grained, brown, fine to medium grained, sub-angular, igneous gravel.	M			INSUFFICIENT RETURN FOR BULK SAMPLE
										END OF BOREHOLE AT 0.2m				HAND AUGER REFUSAL
							0.5							
							1							
							1.5							
							2							
							2.5							
							3							
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. JKE9 1/1

SDUP1: 0-0.1m

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED 'STAGE 2' DEVELOPMENT

Location: NEPEAN HOSPITAL, DERBY STREET, KINGSWOOD, NSW

Job No.: E34236PL **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 12/10/21 **Datum:** -

Plant Type: - **Logged/Checked by:** H.W./M.D.

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 clayey sand, fine to medium grained, dark brown, trace of sandstone gravel, bark, wood, slag and root fibres.	M			MULCH COVER SCREEN: 10.0kg 0-0.1m NO FCF
							0.5			FILL: Silty sandy clay, low to medium plasticity, brown, fine to medium grained sand, trace of igneous gravel, and ash. END OF BOREHOLE AT 0.5m	w<PL			INSUFFICIENT RETURN FOR BULK SAMPLE SCREEN: 3.0kg 0.1-0.35m NO FCF HAND AUGER REFUSAL
							1							
							1.5							
							2							
							2.5							
							3							
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **JKE10** **1/1**

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED 'STAGE 2' DEVELOPMENT

Location: NEPEAN HOSPITAL, DERBY STREET, KINGSWOOD, NSW

Job No.: E34236PL **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 12/10/21 **Datum:** -

Plant Type: - **Logged/Checked by:** H.W./M.D.

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 clayey sand, fine to medium grained, dark brown, with bark material, trace of sandstone gravel, and root fibres.	D w<PL			MULCH COVER SCREEN: 7.6kg 0-0.1m NO FCF
							0.5			FILL: Silty gravelly clay, medium to high plasticity, yellow brown, fine to medium grained, sub-angular, igneous gravel, trace of sandstone gravel, brick fragments and ash.				SCREEN: 4.0kg 0.1-1.0m NO FCF
							1		CI-CH	Silty CLAY: medium to high plasticity, orange brown mottled grey, trace of ironstone gravel.	w<PL			RESIDUAL
										END OF BOREHOLE AT 1.1m				HAND AUGER REFUSAL
							1.5							
							2							
							2.5							
							3							
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **JKE11** **1/1**

SDUP7: 0-0.1m

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED 'STAGE 2' DEVELOPMENT

Location: NEPEAN HOSPITAL, DERBY STREET, KINGSWOOD, NSW

Job No.: E34236PL **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 14/10/21 **Datum:** -

Plant Type: - **Logged/Checked by:** H.W./M.D.

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 clayey sand, fine to medium grained, dark brown, trace of ironstone gravel and root fibres.	M			PINE NEEDLE COVER
	■		■		■						w<PL			
	■		■		■				CI-CH	FILL: Silty clay, medium to high plasticity, brown, trace of igneous and ironstone gravel, ash and root fibres.	w<PL			SCREEN: 10.7kg 0-0.1m NO FCF
							0.5			Silty CLAY: medium to high plasticity, yellow brown mottled orange brown, trace of ironstone gravel.				SCREEN: 10.7kg 0.1-0.2m NO FCF
										END OF BOREHOLE AT 0.3m				RESIDUAL HAND AUGER REFUSAL
							1							
							1.5							
							2							
							2.5							
							3							
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. JKE12 1/1

SDUP4: 0.1-0.3m

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED 'STAGE 2' DEVELOPMENT

Location: NEPEAN HOSPITAL, DERBY STREET, KINGSWOOD, NSW

Job No.: E34236PL **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 13/10/21 **Datum:** -

Plant Type: - **Logged/Checked by:** H.W./M.D.

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: Mulch, brown, with fine to medium grained sand.	M			SCREEN: 5.45kg 0-0.1m NO FCF
										FILL: Silty sand, fine to medium grained, brown, trace of sandstone gravel, concrete fragments, and root fibres.				SCREEN: 10.2kg 0.1-0.3m NO FCF
							0.5			END OF BOREHOLE AT 0.3m				HAND AUGER REFUSAL
							1							
							1.5							
							2							
							2.5							
							3							
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **JKE13** **1/1**

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED 'STAGE 2' DEVELOPMENT

Location: NEPEAN HOSPITAL, DERBY STREET, KINGSWOOD, NSW

Job No.: E34236PL **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 14/10/21 **Datum:** -

Plant Type: - **Logged/Checked by:** H.W./M.D.

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 sand, fine to medium grained, dark brown, trace of igneous gravel, ash and root fibres.	M			GRASS COVER
											w<PL			SCREEN: 10.4kg 0-0.1m NO FCF
	■		■						CI-CH	FILL: Silty gravelly clay, low to medium plasticity, brown, fine to medium grained, sub-angular, igneous gravel, trace of coal, glass and root fibres.	w<PL			SCREEN: 6.26kg 0.1-0.3m NO FCF
							0.5			Silty CLAY: medium to high plasticity, yellow brown mottled orange brown, trace of ironstone gravel.				RESIDUAL
										END OF BOREHOLE AT 0.4m				HAND AUGER REFUSAL
							1							
							1.5							
							2							
							2.5							
							3							
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Log No. **JKE14** 1/1

Environmental logs are not to be used for geotechnical purposes

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED 'STAGE 2' DEVELOPMENT

Location: NEPEAN HOSPITAL, DERBY STREET, KINGSWOOD, NSW

Job No.: E34236PL **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 13/10/21 **Datum:** -

Plant Type: - **Logged/Checked by:** H.W./M.D.

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 clayey sand, fine to medium grained, dark brown, trace of igneous and ironstone gravel, and root fibres.	M w<PL			GRASS COVER SCREEN: 10.05kg 0-0.1m NO FCF
							0.5			FILL: Silty gravelly clay, low to medium plasticity, brown, fine to medium grained, sub-angular, igneous gravel, trace of siltstone gravel, concrete fragments and root fibres.				SCREEN: 4.5kg 0.1-0.2m NO FCF
										END OF BOREHOLE AT 0.2m				HAND AUGER REFUSAL
							1							
							1.5							
							2							
							2.5							
							3							
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **JKE15** **1/1**

SDUP5: 0-0.1m

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED 'STAGE 2' DEVELOPMENT

Location: NEPEAN HOSPITAL, DERBY STREET, KINGSWOOD, NSW

Job No.: E34236PL **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 14/10/21 **Datum:** -

Plant Type: - **Logged/Checked by:** H.W./M.D.

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 sandy clay, low to medium plasticity, brown, fine to medium grained sand, trace of ironstone and siltstone gravel, ash and root fibres.	w<PL			GRASS COVER SCREEN: 10.65kg 0-0.1m NO FCF
									CI-CH	Silty CLAY: medium to high plasticity, yellow brown mottled orange brown, trace of ironstone gravel and root fibres.	w<PL			SCREEN: 10.0kg 0.1-0.3m NO FCF
							0.5			END OF BOREHOLE AT 0.35m				RESIDUAL HAND AUGER
							1							
							1.5							
							2							
							2.5							
							3							
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Log No. **JKE16** **1/1**

Environmental logs are not to be used for geotechnical purposes

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED 'STAGE 2' DEVELOPMENT

Location: NEPEAN HOSPITAL, DERBY STREET, KINGSWOOD, NSW

Job No.: E34236PL **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 14/10/21 **Datum:** -

Plant Type: - **Logged/Checked by:** H.W./M.D.

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 sand, fine to medium grained, brown, trace of ironstone and sandstone gravel, steel, glass, sandstone paver fragments and root fibres.	D			MULCH COVER SCREEN: 10.0kg 0-0.1m NO FCF
										FILL: Silty clayey sand, fine to medium grained, yellow brown, with sandstone cobbles.	M			INSUFFICIENT RETURN FOR BULK SAMPLE SCREEN: 10.1kg 0.1-0.3m NO FCF
							0.5			END OF BOREHOLE AT 0.35m				HAND AUGER REFUSAL
							1							
							1.5							
							2							
							2.5							
							3							
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **JKE17** **1/1**

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED 'STAGE 2' DEVELOPMENT

Location: NEPEAN HOSPITAL, DERBY STREET, KINGSWOOD, NSW

Job No.: E34236PL **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 14/10/21 **Datum:** -

Plant Type: - **Logged/Checked by:** H.W./M.D.

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 gravelly clay, low to medium plasticity, brown, fine to medium grained, sub-angular, igneous gravel, trace of sandstone gravel, concrete fragments, ash and root fibres.	w<PL			LEAF COVER SCREEN: 10-1kg 0-0.1m NO FCF
										END OF BOREHOLE AT 0.4m				SCREEN: 2.8kg 0.1-0.4m NO FCF HAND AUGER REFUSAL
							0.5							
							1							
							1.5							
							2							
							2.5							
							3							
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **JKE18** **1/1**

SDUP6: 0-0.1m

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED 'STAGE 2' DEVELOPMENT

Location: NEPEAN HOSPITAL, DERBY STREET, KINGSWOOD, NSW

Job No.: E34236PL **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 14/10/21 **Datum:** -

Plant Type: - **Logged/Checked by:** H.W./M.D.

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 sandy clay, low to medium plasticity, brown, fine to medium grained sand, trace of igneous gravel, ash and root fibres.	w≈PL			SCREEN: 10.26kg 0-0.1m NO FCF
									CI-CH		w<PL			RESIDUAL
										Silty CLAY: medium to high plasticity, yellow brown mottled orange brown, trace of ironstone gravel.				HAND AUGER REFUSAL
							0.5			END OF BOREHOLE AT 0.3m				
							1							
							1.5							
							2							
							2.5							
							3							
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **JKE19** **1/1**

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED 'STAGE 2' DEVELOPMENT

Location: NEPEAN HOSPITAL, DERBY STREET, KINGSWOOD, NSW

Job No.: E34236PL **Method:** HAND AUGER **R.L. Surface:** N/A

Date: 14/10/21 **Datum:** -

Plant Type: - **Logged/Checked by:** H.W./M.D.

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 sand, fine to medium grained, brown, trace of igneous and ironstone gravel, plastic and root fibres.	D			MULCH COVER
									CI-CH	Silty CLAY: medium to high plasticity, yellow brown mottled orange brown, trace of ironstone gravel.	w<PL			SCREEN: 10.1kg 0-0.1m NO FCF
	■		■				0.5			END OF BOREHOLE AT 0.5m				SCREEN: 10.0kg 0.1-0.2m NO FCF
							1							RESIDUAL
							1.5							HAND AUGER REFUSAL
							2							
							2.5							
							3							
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **JKE20** **1/1**

SDUP11: 0.05-0.2m

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED 'STAGE 2' DEVELOPMENT

Location: NEPEAN HOSPITAL, DERBY STREET, KINGSWOOD, NSW

Job No.: E34236PL **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 19/10/21 **Datum:** -

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

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			ASPHALTIC CONCRETE: 50mm.t				
									-	FILL: Silty gravelly sand, fine to medium grained dark grey, fine to medium grained, sub-angular, igneous gravel.	M			SCREEN: 2.6kg 0.05-0.2m NO FCF
											w<PL			SCREEN: 2.1kg 0.2-0.4m NO FCF
									CI-CH	FILL: Silty clay, low to medium plasticity, with sand, trace of ironstone and sandstone gravel, and ash.	w<PL			HAND AUGER TO 0.5m DEPTH
						N = 5 2,2,3	0.5			Silty CLAY: medium to high plasticity, grey mottled orange brown, trace of ironstone gravel.				RESIDUAL
							1							
							1.5			END OF BOREHOLE AT 1.5m				
							2							
							2.5							
							3							
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. JKE21 1/2

SDUP9: 0.05-0.2m

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED 'STAGE 2' DEVELOPMENT

Location: NEPEAN HOSPITAL, DERBY STREET, KINGSWOOD, NSW

Job No.: E34236PL **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 19/10/21 **Datum:** -

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

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						PID = 7.0	0			ASPHALTIC CONCRETE: 50mm.t				
									-	FILL: Silty gravelly sand, fine to medium grained, dark grey, fine to medium grained, sub-angular, igneous gravel, trace of sandstone gravel.	M			SCREEN: 5.2kg 0.05-0.2m NO FCF
						PID = 0.3								SCREEN: 2.6kg 0.2-0.5m NO FCF
						PID = 0	0.5		CI-CH	FILL: Silty clayey sand, fine to medium grained, yellow brown, trace of sandstone gravel.	w≈PL			HAND AUGER TO 0.5m DEPTH
						N = 8 3,3,5				Silty CLAY: medium to high plasticity, grey mottled orange brown, trace of ironstone gravel.				RESIDUAL
						PID = 0	1							
						N > 7 17,7/ 50mm	1.5		-	Extremely Weathered siltstone: silty CLAY, low to medium plasticity, brown, trace of ironstone gravel.	XW			BRINGELLY SHALE
						REFUSAL PID = 0				SILTSTONE: brown.	DW-SW			
							2							
							2.5							
						PID = 0	3							
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. JKE21 2/2

SDUP9: 0.05-0.2m

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED 'STAGE 2' DEVELOPMENT

Location: NEPEAN HOSPITAL, DERBY STREET, KINGSWOOD, NSW

Job No.: E34236PL **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 19/10/21 **Datum:** -

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

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
						PID = 0				SILTSTONE: brown.	DW-SW			BRINGELLY SHALE
							4			END OF BOREHOLE AT 4.0m				
							4.5							
							5							
							5.5							
							6							
							6.5							
							7							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. JKE22 1/3

SDUP3: 0.05-0.2m

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED 'STAGE 2' DEVELOPMENT

Location: NEPEAN HOSPITAL, DERBY STREET, KINGSWOOD, NSW

Job No.: E34236PL **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 18/10/21 **Datum:** -

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

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						PID = 0	0		-	ASPHALTIC CONCRETE: 50mm.t FILL: Silty gravelly sand, fine to medium grained, grey, fine to medium grained, sub-angular, igneous gravel, trace of slag.	M			SCREEN: 5.9kg 0.05-0.2m NO FCF
						PID = 0								HAND AUGER TO 0.5m DEPTH
						N = 15 3,6,9	0.5		CI-CH	FILL: Silty sandy gravel, medium to coarse grained, yellow brown, medium to coarse grained, angular, igneous, fine to medium grained sand, with clay nodules.	w<PL			SCREEN: 5.0kg 0.2-0.4m NO FCF
							1			Silty CLAY: medium to high plasticity, grey mottled red brown, with ironstone gravel.				RESIDUAL
						PID = 0	1.5							
						N > 26 7,14, 12/ 100mm			-	Extremely Weathered siltstone: silty CLAY, low to medium plasticity, brown.	XW			BRINGELLY SHALE
						REFUSAL				SILTSTONE: brown.	DW-SW			LOW TO MODERATE 'TC' BIT RESISTANCE
						PID = 0	2							
							2.5							
						PID = 0	3							
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. JKE22 2/3

SDUP3: 0.05-0.2m

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED 'STAGE 2' DEVELOPMENT

Location: NEPEAN HOSPITAL, DERBY STREET, KINGSWOOD, NSW

Job No.: E34236PL **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 18/10/21 **Datum:** -

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

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
										SILTSTONE: brown.	DW-SW			
			■			PID = 0	4							
							4.5							
							5							
							5.5			as above, but grey.				
							6							
							6.5							
ON 27/10/21 ▼							7							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. JKE22 3/3

SDUP3: 0.05-0.2m

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED 'STAGE 2' DEVELOPMENT

Location: NEPEAN HOSPITAL, DERBY STREET, KINGSWOOD, NSW

Job No.: E34236PL **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 18/10/21 **Datum:** -

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

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
							7.5			SILTSTONE: grey.	DW-SW			
							8							
							8.5							
							9			END OF BOREHOLE AT 9.0m				GROUNDWATER MONITORING WELL INSTALLED TO 8.0m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 2.0m TO 8.0m. CASING 0.05m TO 2.0m. 2mm SAND FILTER PACK 1.5m TO 8.0m. BENTONITE SEAL 1.0m TO 1.5m. BACKFILLED WITH SAND TO THE SURFACE. COMPLETED WITH A CONCRETED GATIC COVER.
							9.5							
							10							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **JKE23** **1/3**

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED 'STAGE 2' DEVELOPMENT

Location: NEPEAN HOSPITAL, DERBY STREET, KINGSWOOD, NSW

Job No.: E34236PL **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 18/10/21 **Datum:** -

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

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						PID = 0	0			FILL: Silty sandy clay, low plasticity, brown, fine to medium grained sand, trace of igneous and sandstone gravel, concrete and brick fragments, and root fibres.	w<PL			GRASS COVER
						PID = 0								SCREEN: 13.30kg 0-0.1m FCF1 AT 0-0.1m
										FILL: Silty clay, low to medium plasticity, brown, trace of igneous and ironstone gravel, sand and ash.				SCREEN: 2.5kg 0.1-0.2m NO FCF
						PID = 0	0.5							SCREEN: 3.8kg 0.2-1.3m NO FCF
							1							HAND AUGER RETURN AT 1.0m IN FILL
						PID = 0	1.5							SCREEN: 6.7kg 1.2-2.0m NO FCF
							2		CI-CH	Silty CLAY: medium to high plasticity, grey mottled red brown, trace of ironstone gravel and root fibres.	w<PL			RESIDUAL
							2.5							
						PID = 0	3							
						N = 11 4,4,7	3.5							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **JKE23** 2/3

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED 'STAGE 2' DEVELOPMENT

Location: NEPEAN HOSPITAL, DERBY STREET, KINGSWOOD, NSW

Job No.: E34236PL **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 18/10/21 **Datum:** -

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

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
									CI-CH	Silty CLAY: medium to high plasticity, grey mottled red brown, trace of ironstone gravel and root fibres.	w<PL			RESIDUAL
ON 27/10/21 ▼							4							
							4.5							
							5							
							5.5							
							6							
							6.5							
							7							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **JKE23** **3/3**

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED 'STAGE 2' DEVELOPMENT

Location: NEPEAN HOSPITAL, DERBY STREET, KINGSWOOD, NSW

Job No.: E34236PL **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 18/10/21 **Datum:** -

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

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
									-	SILTSTONE: grey.	DW-SW			BRINGELLY SHALE LOW TO MODERATE 'TC' BIT RESISTANCE
							7.5			END OF BOREHOLE AT 7.6m				'TC' BIT REFUSAL IN SILTSTONE BEDROCK GROUNDWATER MONITORING WELL INSTALLED TO 6.7m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 2.2m TO 6.7m. CASING 0m TO 2.2m. 2mm SAND FILTER PACK 2.0m TO 6.7m. BENTONITE SEAL 1.5m TO 2.0m. BACKFILLED WITH SAND TO THE SURFACE. COMPLETED WITH A CONCRETED GATIC COVER.
							8							
							8.5							
							9							
							9.5							
							10							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **JKE24** **1/2**

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED 'STAGE 2' DEVELOPMENT

Location: NEPEAN HOSPITAL, DERBY STREET, KINGSWOOD, NSW

Job No.: E34236PL **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 18/10/21 **Datum:** -

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

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		-	ASPHALTIC CONCRETE: 40mm.t FILL: Silty gravelly sand, fine to medium grained, grey, fine to medium grained, sub-angular, igneous gravel, trace of slag.	M			SCREEN: 6.45kg 0.04-0.4m NO FCF
							0.5			FILL: Silty gravelly clay, low to medium plasticity, grey, fine to medium grained, sub-angular, igneous gravel, trace of sand, ironstone gravel and root fibres.	w<PL			SCREEN: 4.5kg 0.4-0.6m
									CI-CH	Silty CLAY: medium plasticity, grey mottled red brown, trace of ironstone gravel, and root fibres.	w<PL			HAND AUGER REFUSAL AT 0.5m RESIDUAL IN FILL
							1		-	Extremely Weathered siltstone: silty CLAY, low to medium plasticity, brown.	XW			BRINGELLY SHALE LOW 'TC' BIT RESISTANCE
						N > 26 4,13, 13/ 100mm	1.5							
						REFUSAL	2			SILTSTONE: brown.	DW-SW			MODERAE RESISTANCE
							2.5							
							3							
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **JKE24** **2/2**

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED 'STAGE 2' DEVELOPMENT

Location: NEPEAN HOSPITAL, DERBY STREET, KINGSWOOD, NSW

Job No.: E34236PL **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 18/10/21 **Datum:** -

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

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
▼ ON 27/10/21							4 4.5 5 5.5 6 6.5			SILTSTONE: brown.	DW-SW			BRINGELLY SHALE GROUNDWATER MONITORING WELL INSTALLED TO 6.0m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 2.0m TO 6.0m. CASING 0.04m TO 2.0m. 2mm SAND FILTER PACK 1.5m TO 6. 0m. BENTONITE SEAL 1.0m TO 1. 5m. BACKFILLED WITH SAND TO THE SURFACE. COMPLETED WITH A CONCRETED GATIC COVER.
							7			END OF BOREHOLE AT 6.7m				'TC' BIT REFUSAL IN SILTSTONE BREDROCK

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. JKE25
1/3

SDUP10: 0.05-0.4m

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED 'STAGE 2' DEVELOPMENT

Location: NEPEAN HOSPITAL, DERBY STREET, KINGSWOOD, NSW

Job No.: E34236PL **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 19/10/21 **Datum:** -

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

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			ASPHALTIC CONCRETE: 50mm.t				
									-	FILL: Silty gravelly clay, dark grey, fine to medium grained, sub-angular, igneous gravel, trace of slag.	M			SCREEN: 7.0kg 0-05-0.4m NO FCF
														HAND AUGER TO 1.6m
									CI-CH	Silty CLAY: medium to high plasticity, grey mottled orange brown, trace of ironstone gravel.	w≈PL			RESIDUAL
							0.5							
							1							
							1.5							
							2							
							2.5							
							3		-	SILSTONE: brown.	DW-SW			BRINGELLY SHALE
														LOW TO MODERATE 'TC' BIT RESISTANCE
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. JKE25 2/3

SDUP10: 0.05-0.4m

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED 'STAGE 2' DEVELOPMENT

Location: NEPEAN HOSPITAL, DERBY STREET, KINGSWOOD, NSW

Job No.: E34236PL **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 19/10/21 **Datum:** -

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

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
										SILSTONE: brown.	DW-SW			BRINGELLY SHALE
							4							
							4.5							
							5			as above, but grey.				
							5.5							
							6							
							6.5							
							7							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. JKE25 3/3

SDUP10: 0.05-0.4m

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED 'STAGE 2' DEVELOPMENT

Location: NEPEAN HOSPITAL, DERBY STREET, KINGSWOOD, NSW

Job No.: E34236PL **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 19/10/21 **Datum:** -

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

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
▼ ON 27/10/21							7.5			SILTSTONE: grey.	DW-SW			BRINGELLY SHALE
							8							
							8.5			END OF BOREHOLE AT 8.5m				'TC' BIT REFUSAL IN SILTSTONE BEDROCK GROUNDWATER MONITORING WELL INSTALLED TO 7.8m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 1.8m TO 7.8m. CASING 0.05m TO 1.8m. 2mm SAND FILTER PACK 1.0m TO 7.8m. BENTONITE SEAL 0.5m TO 1.0m. BACKFILLED WITH SAND TO THE SURFACE. COMPLETED WITH A CONCRETED GATIC COVER.
							9							
							9.5							
							10							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. **JKE26** **1/1**

SDUP8: 0.05-0.3m

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED 'STAGE 2' DEVELOPMENT

Location: NEPEAN HOSPITAL, DERBY STREET, KINGSWOOD, NSW

Job No.: E34236PL **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 19/10/21 **Datum:** -

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

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	■		■		■	PID = 1.4	0		-	ASPHALTIC CONCRETE: 50mm.t FILL: Silty sand, fine to medium grained, yellow brown, trace of igneous and sandstone gravel.	D			SCREEN: 6.15kg 0.05-0.3m NO FCF
	■		■		■	PID = 0				FILL: Silty clayey sand, fine to medium grained, brown, trace of igneous gravel.				SCREEN: 2.05kg 0.3-0.5m NO FCF
							0.5		CI-CH	Silty CLAY: medium to high plasticity, brown, mottled yellow brown, trace of ironstone gravel.	w<PL			HAND AUGER TO 0.5m RESIDUAL
	■		■			PID = 0	1							
	■		■			PID = 0	1.5			Silty CLAY: medium to high plasticity, grey mottled yellow brown, trace of root fibres.				
						N = 11 3,4,7								
							2			END OF BOREHOLE AT 1.95m				
							2.5							
							3							
							3.5							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Log No. JKE27 **1/1**

SDUP8: 0.05-0.3m

Client: HEALTH INFRASTRUCTURE

Project: PROPOSED 'STAGE 2' DEVELOPMENT

Location: NEPEAN HOSPITAL, DERBY STREET, KINGSWOOD, NSW

Job No.: E34236PL **Method:** SPIRAL AUGER **R.L. Surface:** N/A

Date: 19/10/21 **Datum:** -

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

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						PID = 0	0			FILL: Silty sandy clay, low plasticity, brown, fine to medium grained sand, trace of igneous gravel, brick fragments, ash and root fibres.	w<PL			GRASS COVER
						PID = 0								SCREEN: 10.0kg 0-0.1m NO FCF
														SCREEN: 4.4kg 0.1-0.5m NO FCF
							0.5		CI-CH	Silty CLAY: medium to high plasticity, red brown mottled orange brown, trace of ironstone gravel.	w≈PL			RESIDUAL
						PID = 0	1							HAND AUGER REFUSAL AT 0.6m
						PID = 0	1.5			Silty CLAY: medium to high plasticity, grey mottled yellow brown, trace of root fibres.				
						N = 9 3,3,6								
							2			END OF BOREHOLE AT 1.95m				
							2.5							
							3							
							3.5							

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:

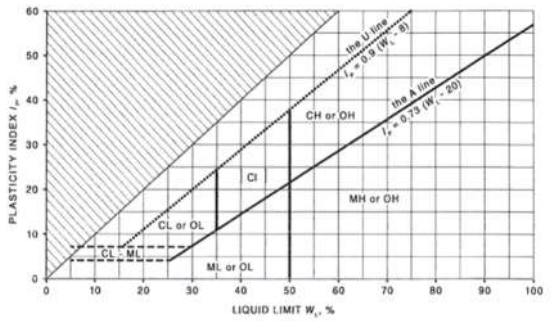
1 For a coarse grained soil with a fines content between 5% and 12%, the soil is given a dual classification comprising the two group symbols separated by a dash; for example, for a poorly graded gravel with between 5% and 12% silt fines, the classification is GP-GM.

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.

Appendix C: Imported Materials and Waste Tracking Templates

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 D: Guidelines and Reference Documents

Contaminated Land Management Act 1997 (NSW)

Conveyancing Act (1919) (NSW).

Environmental Planning and Assessment Act 1979 (NSW)

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

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)

Protection of the Environment Operations Act 1997 (NSW)

State Environmental Planning Policy No.55 – Remediation of Land 1998 (NSW)

Work Health and Safety Regulation 2017 (NSW)

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