REPORT TO

NSW HEALTH INFRASTRUCTURE

ON

REMEDIATION ACTION PLAN

FOR

PROPOSED GRIFFITH HOSPITAL REDEVELOPMENT

AT

GRIFFITH BASE HOSPITAL, NOOREBAR AVENUE, GRIFFITH, NSW

Date: 25 April 2020

Ref: E30991BTrpt3Rev2

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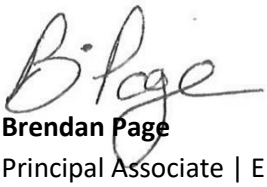

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Executive Summary

Health Infrastructure ('the client') commissioned JK Environments (JKE) to prepare an over-arching remediation action plan (RAP) for the proposed hospital redevelopment at Griffith Base Hospital, Noorebar Avenue, Griffith, NSW ('the site'). The site location is shown on Figure 1 and the RAP applies to the land within the site boundaries as shown on Figure 2.

JKE have previously undertaken a Preliminary Environmental Site Assessment (PESA) and Additional Environmental Site Assessment (AESA) at the site. GHD have previously undertaken Phase 2 Environmental Site Assessments for the Stage 1 and Stage 2 development areas. A summary of this information has been included in Section 2. The previous investigations identified decommissioned underground storage tanks (USTs) and asbestos in fill/soil. The RAP has been prepared to provide an over-arching plan for the site and includes the methodology to address the identified USTs and asbestos impacts, and validate the site to make it suitable for the proposed redevelopment (from a contamination viewpoint).

It is understood the proposed multi-stage redevelopment will involve the progressive demolition of existing hospital buildings and structures, followed by construction of a new main hospital building and several ancillary services buildings. The development includes construction of a large carparking area at the southern end of the site. The documents provided do not indicate the proposed design levels for pavements or buildings, however, the bulk earthworks plans indicate that areas of cut and fill across the site are anticipated to extend to a maximum depth/height of approximately 2.0m (refer to Appendix B).

The goal of the remediation is to render the site suitable for the proposed hospital redevelopment from a contamination viewpoint. Confirmation of suitability will be demonstrated by the validation process. The primary aim of the remediation is to remediate the asbestos contamination/impacts and USTs and associated infrastructure identified during the previous assessments so that risks (associated with exposure to contamination) to construction workers and future site occupants/users are appropriately managed and remain low and acceptable. The objectives of the over-arching RAP are to:

- Provide an over-arching methodology to remediate and validate the site;
- Provide a contingency plan for the remediation works;
- Outline site management procedures to be implemented during remediation work; and
- Provide an unexpected finds protocol to be implemented during the development works.

The remediation strategies proposed in this RAP include excavation and off-site disposal of ACM impacted soil, consolidation and containment of ACM-impacted soils in a designated containment cell, and excavation and off-site disposal of the USTs (and nearby impacted soils) and associated infrastructure.

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) should be reviewed by project manager and remediation contractor, and appropriate steps are to be taken to ensure the adequate implementation of the plan. Once the specific development details are known for each phase of works, further assessment of available data should be undertaken. The extent of remediation should then be identified within that development area and a remedial works plan (RWP) is to be prepared to document the specific work steps for the remediation in line with the framework set out in this RAP.

JKE are of the opinion that the site can be made suitable for the proposed development subject to the implementation of this RAP. A validation report is to be submitted to the consent authority on completion of remediation to demonstrate that the site (or each development stage) is suitable for its intended use.

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

Additional Environmental Site Assessment	**AESA**
Asbestos Fines/Fibrous Asbestos	**AF/FA**
Asbestos Containing Material	**ACM**
Area of Environmental Concern	**AEC**
Australian Height Datum	**AHD**
Acid Sulfate Soil	**ASS**
Above-Ground Storage Tank	**AST**
Below Ground Level	**BGL**
Benzo(a)pyrene Toxicity Equivalent Factor	**BaP TEQ**
Benzene, Toluene, Ethylbenzene, Xylene	**BTEX**
Contaminated Land Management	**CLM**
Contaminant(s) of Potential Concern	**CoPC**
Chain of Custody	**COC**
Conceptual Site Model	**CSM**
Development Application	**DA**
Dial Before You Dig	**DBYD**
Data Quality Indicator	**DQI**
Data Quality Objective	**DQO**
Ecological Investigation Level	**EIL**
Ecological Screening Level	**ESL**
Environmental Management Plan	**EMP**
Excavated Natural Material	**ENM**
Environment Protection Authority	**EPA**
Environmental Site Assessment	**ESA**
Ecological Screening Level	**ESL**
Fibre Cement Fragment(s)	**FCF**
Health Investigation Level	**HILs**
Health Screening Level	**HSL**
International Organisation of Standardisation	**ISO**
JK Environments	**JKE**
Light Non-Aqueous Phase Liquid	**LNAPL**
Map Grid of Australia	**MGA**
National Association of Testing Authorities	**NATA**
National Environmental Protection Measure	**NEPM**
Organochlorine Pesticides	**OCP**
Organophosphate Pesticides	**OPP**
Preliminary Environmental Site Assessment	**PESA**
Polycyclic Aromatic Hydrocarbons	**PAH**
Polychlorinated Biphenyls	**PCBs**
Photo-ionisation Detector	**PID**
Protection of the Environment Operations	**POEO**
Practical Quantitation Limit	**PQL**
Quality Assurance	**QA**
Quality Control	**QC**
Remediation Action Plan	**RAP**
Remedial Works Plan	**RWP**
Relative Percentage Difference	**RPD**
Site Assessment Criteria	**SAC**
Sampling, Analysis and Quality Plan	**SAQP**
Source, Pathway, Receptor	**SPR**
Specific Contamination Concentration	**SCC**
Standard Penetration Test	**SPT**
Standard Sampling Procedure	**SSP**

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

Units

Litres	**L**
Metres BGL	**mBGL**
Metres	**m**
Micrograms per Litre	**µg/L**
Milligrams per Kilogram	**mg/kg**
Milligrams per Litre	**mg/L**
Parts Per Million	**ppm**
Percentage	**%**

1 INTRODUCTION

Health Infrastructure ('the client') commissioned JK Environments (JKE) to prepare an over-arching remediation action plan (RAP) for the proposed hospital redevelopment at Griffith Base Hospital, Noorebar Avenue, Griffith, NSW ('the site'). The site location is shown on Figure 1 and the RAP applies to the land within the site boundaries as shown on Figure 2.

JKE have previously undertaken a Preliminary Environmental Site Assessment (PESA)[1] and Additional Environmental Site Assessment (AESA)[2] at the site. GHD have previously undertaken Phase 2 Environmental Site Assessments for the Stage 1[3] and Stage 2[4] development areas. A summary of this information has been included in Section 2. The previous investigations identified decommissioned underground storage tanks (USTs) and asbestos in fill/soil. The RAP has been prepared to provide an over-arching plan for the site and includes the methodology to address the identified USTs and asbestos impacts, and validate the site to make it suitable for the proposed redevelopment (from a contamination viewpoint).

1.1 Proposed Development Details

It is understood the proposed multi-stage redevelopment will involve the progressive demolition of existing hospital buildings and structures, followed by construction of a new main hospital building and several ancillary services buildings. The development includes construction of a large carparking area at the southern end of the site. The documents provided do not indicate the proposed design levels for pavements or buildings, however, the bulk earthworks plans indicate that areas of cut and fill across the site are anticipated to extend to a maximum depth/height of approximately 2.0m (refer to Appendix B).

1.2 Remediation Goal, Aims and Objectives

The goal of the remediation is to render the site suitable for the proposed hospital redevelopment from a contamination viewpoint. Confirmation of suitability will be demonstrated by the validation process.

The primary aim of the remediation is to remediate the asbestos contamination/impacts and USTs and associated infrastructure identified during the previous assessments so that risks (associated with exposure to contamination) to construction workers and future site occupants/users are appropriately managed and remain low and acceptable.

The objectives of the RAP are to:

- Provide an over-arching methodology to remediate and validate the site;
- Provide a contingency plan for the remediation works;
- Outline site management procedures to be implemented during remediation work; and

[1] EIS (2017). Report to Health Infrastructure on Preliminary Environmental Site Assessment for Proposed Hospital Upgrade at 5-39 Animoo Avenue, Griffith, (report ref: E30991KH, dated 8 December 2017) (referred to as the PESA).
[2] JKE, (2019). Report to Health Infrastructure on Additional Environmental Site Assessment for Proposed Hospital Redevelopment at Griffith Health Services, Noorebar Avenue, Griffith, NSW, (report ref: E30991BTrpt2, dated 25 November 2019) (referred to as the AESA)
[3] GHD (2018). NSW Health Infrastructure Griffith Hospital Stage 1 Development Area Phase 2 Environmental Site Assessment, Noorebar Avenue, Griffith, NSW (dated December 2018) (referred to as GHD Stage 1 Development Area Phase 2 ESA report 2018)
[4] GHD (2018). NSW Health Infrastructure Griffith Hospital Stage 2 Development Area Phase 2 Environmental Site Assessment Noorebar Avenue, Griffith, NSW (dated December 2018) (referred to as GHD Stage 2 Development Area Phase 2 ESA report 2018)

- Provide an unexpected finds protocol to be implemented during the development works.

1.3 Scope of Work

The RAP was prepared generally in accordance with a JKE proposal (Ref: EP514434BT) of 16 March 2020 and written acceptance from the client of 19 March 2020. The scope of work included the following:

- Review of the previous assessment reports for the hospital property (refer to Section 2.1);
- Review of the proposed development details; and
- Preparation of the RAP report.

The scope of work was undertaken with reference to the regulations/guidelines made under or with regards to the Contaminated Land Management Act (1997)[5], State Environmental Planning Policy No.55 – Remediation of Land (1998)[6], Managing Land Contamination, Planning Guidelines SEPP55 – Remediation of Land (1998)[7], and Guidelines for Consultants Reporting on Contaminated Sites (2011)[8]. A list of reference documents/guidelines is included in the appendices.

[5] Contaminated Land Management Act 1997 (NSW) (referred to as CLM Act 1997)
[6] *State Environmental Planning Policy No. 55 – Remediation of Land 1998* (NSW) (referred to as SEPP55)
[7] Department of Urban Affairs and Planning, and Environment Protection Authority, (1998). *Managing Land Contamination, Planning Guidelines SEPP55 – Remediation of Land*. (SEPP55 Planning Guidelines)
[8] NSW Office of Environment and Heritage (OEH), (2011). *Guidelines for Consultants Reporting on Contaminated Sites.* (referred to as Reporting Guidelines 2011)

2 SITE INFORMATION

2.1 Background

2.1.1 EIS PESA Report 2017

EIS (now JKE) were engaged to undertake a PESA for the site in November / December 2017. The ESA included a review of historical site information and soil sampling from 14 boreholes targeted at the proposed development areas.

During the site inspection, the maintenance staff informed the EIS representative that petrol and diesel USTs were located immediately east of the maintenance workshop. No further details regarding the removal of the USTs was available at the time of the assessment.

The following potential contamination sources were identified at the site:

- Fill material across the entire site;
- Fuel storage in the former USTs;
- Fuels, oils and solvents may have been used and stored in the maintenance workshop and gardeners shed;
- The site may have been used for grazing and/or market garden purposes;
- Pesticides may have been used beneath the buildings and/or around the site; and
- Hazardous building materials may be present as a result of former building and demolition activities. These materials may also be present in the existing buildings/ structures on site. Several buildings that were constructed prior to 1945 in the central section of the site had been demolished.

A total of 14 boreholes were drilled for the assessment. The boreholes typically encountered shallow fill material or natural soil at the surface, underlain by shallow bedrock. Groundwater was not encountered in the boreholes during drilling. A selection of samples were also analysed for the contaminants of potential concern (CoPC) which included 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. The soil analysis results were all less than the adopted site assessment criteria (SAC) used to assess human health and ecological risks from contamination.

The areas of highest risk were considered to be the former UST area, the maintenance workshop and gardeners shed. There was considered to remain a risk of undiscovered buried asbestos especially in the central section of the site. The report concluded that the site could be made suitable for the proposed development provided that the following recommendations were implemented to address the data gaps and to better manage the risks:

- If an appropriate validation assessment report for the removal of the USTs can be provided this should be reviewed and an addendum letter should be provided summarising the report and assessing the validity of the conclusions in this report. If no validation report can be provided, further assessment of this former UST area will be required;
- Undertake a Hazardous Materials Assessment (Hazmat) for the existing buildings prior to the commencement of demolition work;

- Following site preparation works, the area should be inspected by a contamination consultant in accordance with the unexpected finds procedure outlined in the report; and
- If the suitability of the entire hospital site is to be assessed, further investigation will be required across the wider hospital site.

The figures and summary tables presented in the PESA report have been attached in Appendix C.

2.1.2 GHD Stage 1 Development Area Phase 2 ESA report 2018

GHD was engaged to undertake a Phase 2 ESA of the Stage 1 Development Area of Griffith Base Hospital in November/December 2018. The objectives of the GHD Stage 1 Development Area Phase 2 ESA report 2018 were to evaluate the contamination status of the site in relation to the proposed redevelopment, notably relating to potential areas of fill, and to assess whether concentrations of contaminants at the site present a potential risk to human health and/or the environment.

In order to achieve the above objectives, GHD completed a site investigation program that included a review of the previously completed report prepared by EIS (including the PESA) and publicly available data on the site and surrounds. Intrusive investigations were undertaken and included the drilling of three boreholes with one converted to a groundwater well, excavation of four test pits and the drilling of seven large diameter boreholes with an excavator. Samples from these locations were then analysed and results compared against adopted criteria from guidelines made or approved by the NSW EPA.

GHD made the following conclusions:

- A thin layer of fill and reworked natural materials was identified across a majority of the Stage 1 development area, however this was observed to be generally free of anthropogenic materials. Two locations were identified to contain asbestos via laboratory analysis, although no visible ACM was observed during sampling;
- Fibrous asbestos (FA) in the form of weathered fibre cement fragments was identified in TP122. The concentration was below the adopted human health SAC. Bonded ACM fragments were identified in TP124. The concentration was above the adopted human health SAC. Based on these results the identified asbestos contamination was considered to present a low risk to human health if managed appropriately;
- Elevated concentrations of cadmium, copper, nickel and zinc were identified in groundwater sampled from BH116 above the freshwater Groundwater Investigation Levels (GILs). These exceedances were considered to be the result of local geological conditions (i.e. representative of 'background' groundwater concentrations) and were not considered to represent a significant contamination issue;
- Concentrations of ethyl benzene marginally above laboratory limit of reporting were also detected in groundwater at BH116, with the headspace volatile screening at the time of sampling recorded a result of 16.6 ppm. These results were not considered by GHD to indicate a risk human or ecological receptors, however the results were considered to provide a line of evidence that may suggest impacts from the nearby USTs (Stage 2 development area) and / or maintenance shed. BH116 was considered to be generally downgradient of the location of the USTs; and
- GHD considered that the works undertaken at the site have sufficiently characterised the site to enable an assessment of its suitability for the proposed purpose (hospital with open space grounds), subject to implementation of recommendations.

The report made the following recommendations:

- Development works should include a construction environment management plan (CEMP) containing an asbestos management plan (AMP) and an unexpected finds protocol to identify anthropogenic wastes, remove potential ACM prior to disturbance for appropriate disposal, and separate any wastes that are not acceptable for aesthetic or other reasons, for either management (e.g. emplacement in deeper fill) or disposal. Should unexpected contaminated soils be identified during any future ground works, advice should be sought from a suitably qualified environmental consultant;
- Only limited sampling was possible in the Stage 1 Development Area, due to the presence of buildings. It was understood that demolition of additional buildings was planned as part of the Stage 1 works. Given the former presence of historical buildings in this area, and the constraints to sampling during this investigation, GHD recommended further assessment once the additional buildings were demolished and removed;
- The current or former location of the USTs should be clarified with respect to the site boundary and ownership or responsibility for the USTs defined; and
- Further assessment of shallow groundwater should be considered in the immediate vicinity of the USTs as there is a line of evidence that indicates potential contamination in this area.

The figures and summary tables presented in this report have been attached in Appendix C.

2.1.3 GHD Stage 2 Development Area Phase 2 ESA report 2018

GHD was engaged to undertake a Phase 2 ESA of the Stage 2 Development Area of Griffith Base Hospital in November/December 2018. The objectives of the GHD Stage 2 Development Area Phase 2 ESA report 2018 were to evaluate the contamination status of the site in relation to the proposed redevelopment, notably relating to the former fuel underground storage tanks and potential areas of fill; and to assess whether concentrations of contaminants at the site presented a potential risk to human health and/or the environment.

In order to achieve the above objectives, GHD completed a site investigation program that included a review of the previously completed report prepared by EIS (including the PESA) and publicly available data on the site and surrounds. Intrusive investigations were undertaken and included the drilling of three boreholes, excavation of two test pits and the drilling of 17 large diameter boreholes with an excavator. Samples from these locations were then analysed and results compared against adopted criteria from guidelines made or approved by the NSW EPA.

GHD made the following conclusions:

- A layer of fill and reworked natural materials was identified across a majority of the Stage 2 development area with the greatest thickness of this material located in the north of the site beneath the northern carpark. This material was observed to be generally free of anthropogenic materials with the exception of a fragment of ceramic tile located in IP140;
- One fill soil sample BH107 (0.05-0.2) reported an elevated TRH (F3) concentration of 390mg/kg, which exceeded the adopted ecological SAC of 300 mg/kg. The source was considered likely to be a result of an isolated (top-down) spill or potential biological source; and

- GHD considered that the works undertaken at the site sufficiently characterised the site to enable an assessment of its suitability for the proposed purpose (hospital with open space grounds), subject to implementation of recommendations.

The report made the following recommendations:

- Any development works undertaken within the Stage 2 area should include a CEMP containing an unexpected find protocol to identify anthropogenic wastes, remove potential ACM prior to disturbance for appropriate disposal, and separate any wastes that are not acceptable for aesthetic or other reasons, for either management (e.g. emplacement in deeper fill) or disposal. Should unexpected contaminated soils be identified during any future ground works, advice should be sought from a suitably qualified environmental consultant;
- The current or former location of the USTs should be clarified with respect to the site boundary and ownership or responsibility for the USTs defined; and
- Further assessment of shallow groundwater should be considered in the immediate vicinity of the USTs as there is a line of evidence that indicates potential contamination in this area.

The figures and summary tables presented in this report have been attached in Appendix C.

2.1.4 GHD HAZMAT report 2018

GHD was engaged to complete pre-demolition hazardous building materials assessments and compile a register for 14 of the 29 buildings and structures (referred to as assets). Both bonded and friable asbestos was identified at the site during the assessment. Synthetic mineral fibre (SMF) containing materials, lead based paint, capacitors containing PCBs, and ozone depleting substances were also identified throughout the site.

2.1.5 JKE AESA report 2019

In 2019 JKE were engaged to undertake an AESA of the northern redevelopment area of the hospital property. The assessment was limited to the proposed northern redevelopment area only (generally within the proposed Stage 2 Main Building footprint), which occupies a large portion of the northern section of the site.

The primary aims of the assessment were to provide additional information for the proposed redevelopment. The assessment objectives were to:

- Review existing site conceptual site model (CSM) based on investigation findings;
- Assess the soil contamination conditions via implementation of a sampling and analysis program;
- Assess the potential risks posed by contamination to the receptors identified in the CSM (Tier 1 assessment);
- Provide a waste classification for off-site disposal of soil;
- Assess whether the site is suitable or remediation is required.

Soil samples were obtained from 17 boreholes drilled for the investigation (BH201-BH217). Elevated concentrations of the CoPC were not encountered above the adopted SAC in any of the soil samples analysed.

Based on the data from the assessment, JKE were of the opinion that potential risks associated with widespread subsurface contamination at the site was low, however the report noted that localised risks associated with the USTs should be further assessed and remediated accordingly.

JKE considered that the site can be made suitable for the proposed development provided that the following recommendations were implemented to address the data gaps and to better characterise the risks:

1. Development and implementation of a RAP; and
2. Preparation of a validation report on completion of remediation.

The figures and summary tables presented in this report have been attached in Appendix C.

2.2 Site Identification

Table 2-1: Site Identification

Site Address:	Noorebar Avenue, Griffith, NSW
Lot & Deposited Plan:	Lot 2 DP 1043580
Current Land Use:	Hospital
Proposed Land Use:	Continued use as a hospital
Local Government Authority:	Griffith City Council
Current Zoning:	R1 - General Residential
Site Area (m^2) (approx.):	Total hospital site: 64,000
RL (AHD in m) (approx.):	136.8-141.3
Geographical Location (decimal degrees) (approx.):	Latitude: -34.2820 Longitude: 146.0437

2.3 Site Location and Regional Setting

The site is located in a predominantly residential area of Griffith and is bound by Noorebar Avenue to the south, Animoo Avenue and medical centre to the west, Warrambool Street to the east and by the Private Hospital to the north. The site is located approximately 750m to the north of a concrete lined drainage canal that runs east-west through Griffith.

2.4 Topography

The site is located within undulating to hilly local topography associated with the Griffith Syncline and McPhersons Range Anticline. The site is situated mid-slope on a hill which falls to the south at approximately 3°. The site itself falls to the south-west at a similar grade.

2.5 Site Description/Inspection

A site inspection was not undertaken for preparation of this document. However, information presented in the AESA report indicated that the site was relatively similar to the descriptions presented in the previous reports. Notable observations included the following:

- The site was occupied by various hospital buildings that were typically single or double storey;
- The buildings were typically of brick, concrete panel and/or cinder block construction. Internal roads were located throughout the site and asphaltic concrete paved car parks were located amongst the road network;
- The largest car parks were located in the south-west and north section of the site, adjacent to the main services building and children's ward, respectively;
- A gardener's shed and maintenance workshop were located in the north section of the site. Storage buildings were located immediately south of the workshop and were known to have previously included an incinerator;
- A flammable goods store was located in the gardeners shed. The store included a locked cupboard mounted on concrete pavement. Ride-on lawn mowers and other gardening equipment were also stored in the shed;
- A chemical storeroom for cleaning products was noted to the south of the wash-down bay;
- An equipment wash-down bay was observed to the south of the former boiler house structure. Based on anecdotal information supplied by a senior engineer from the asset maintenance department of the hospital, use of this wash-down bay was limited to the cleaning of food serving equipment (such as cutlery, trays and trolleys) and rubbish bins; the run-off from the wash-down bay is collected by a pit connecting to a grease trap in the area, and wastewater is discharged to the sewage system under a trade waste agreement;
- Unpaved areas across the site were generally grass covered and medium to large trees were scattered observed scattered around the site;
- Some soil was exposed at the ground surface in unpaved areas of the site. The exposed soil appeared to be fill material;
- The former fuel USTs associated with the boiler house were located outside the cadastral boundary of the site, however the site boundary as presented in the GHD reports indicate the UST area to sit on both sides of the property boundary with St Vincent's Private Hospital. No information was available on whether the USTs and the associated vent pipes and fuel lines were removed.

2.6 Surrounding Land Use

During the PESA 2017 site inspection, the following land uses in the immediate surrounds of the site were observed:

- North – St Vincent's Private Hospital, with a residential area beyond. A service station was located approximately 130m north-west of the site;
- South – a residential area that included a child care centre. The area extended to the town centre that included a railway line and station and a shopping centre;
- East – a primary school and parkland; and
- West – a residential area that typically included houses.

During the PESA inspection, JKE did not observe any land uses in the immediate surrounds that were identified as potential contamination sources for the site. The former USTs located adjacent to the maintenance workshop may have represented a potential contamination source prior to removal. The service station (Metro Petroleum Wyangan petrol filling station), located to the north-west was considered unlikely to represent a potential off-site contamination source due to the distance from the site and the cross-gradient location from the site.

2.7 Summary of Geology and Hydrogeology

2.7.1 Regional Geology

Regional geological information reviewed for the PESA indicated that the site is underlain by Barrat Conglomerate of the Cocoparra Group, which typically consists of conglomerate, pebbly sandstone, lithic sandstone, sandstone and siltstone.

2.7.2 Hydrogeology

Hydrogeological information reviewed as part of previous assessments indicated that the regional aquifer on-site and in the areas immediately surrounding the site includes fractured or fissured, extensive aquifers of low to moderate productivity. During the PESA assessment, a total of 33 registered bores were noted within 2km of the site. All of the bores were registered for monitoring purposes, with the nearest located approximately 350m to the east of the site. Standing water levels (SWLs) in the bores within 1,000m ranged from approximately 2.6mBGL to 3.85mBGL.

The subsurface conditions at the site are consisted of shallow fill and residual soils overlying relatively shallow bedrock. The potential for viable groundwater abstraction and use of groundwater under these conditions was considered to be low. Use of groundwater is not proposed as part of the development.

2.8 Receiving Water Bodies

Surface water bodies were not identified in the immediate vicinity of the site. The closest surface water body is the concrete lined Main Canal located approximately 750m to the south of the site.

2.9 Site History Summary

A time line summary of the historical land uses and activities is presented in the table below. The information presented in the table is based on a weight of evidence assessment of the information presented in the previous assessment reports (refer to Section 2.1).

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

Year(s)	Potential Land Use / Activities	Supporting Evidence
Pre-1935	Crown land	Land titles indicated the property was crown land prior to 1935.
1935 to present	• Hospital land use; • Potential filling of the site may have occurred during the progressive development of the site;	• Land titles indicated the site was dedicated as a hospital site in 1934; • Aerial photographs indicated that the central section of the site had been developed by

Year(s)	Potential Land Use / Activities	Supporting Evidence
	• Construction of buildings; • Potential hazardous building materials within existing buildings/structures; • Installation of three diesel fuel USTs in the north of the site; and • Potential installation of 5,000 gallon oil fuel aboveground storage tank (AST).	1945 and additional development and redevelopment was undertaken until the 1980's; and • The UST plans and documents presented in both 2018 GHD reports indicated that three USTs were located in the north of the site and an oil fuel tank (AST) was potentially located within the boiler plant.
Sometime between 2015 to 2017	• Potential filling of the site may have occurred during development of the private hospital and construction of the asphaltic concrete road along the northern boundary; • Removal of diesel fuel from USTs; and • Potential decommissioning of USTs.	• Aerial photographs and inspection findings during the 2017 site walkover indicated that northern section of the site had undergone some development during construction of the neighbouring private hospital; • The UST plans and documents presented in both GHD reports indicated that a quote had been obtained in 2005 for the removal of surplus diesel fuel from the USTs and for the abandonment of the USTs using stabilizing mix in-situ. An undated invoice was also included addressed to the same company for the recoup of money owed to Greater Southern Area Health Service for the sale of surplus fuel from the Griffith Base Hospital site; and • No information was available on whether the USTs and the associated vent pipes and fuel lines were subsequently removed.

3 SITE CHARACTERISATION AND EXTENT OF REMEDIATION

3.1 CSM (Site Characterisation for Remediation)

The table below includes an iteration of the CSM based on the findings of the previous assessments. This CSM has been used to design the remediation strategy.

Table 3-1: CSM

Contamination Source(s) and contaminants of concern	Contamination sources: fill soil, USTs and associated infrastructure. Contaminants of concern: asbestos (fill), and heavy metals, TRH/BTEX and naphthalene (BTEXN) (USTs/infrastructure). In addition to the above, the CoPC listed in Section 2.1.1 are to be considered in the building footprints to address the data gap for waste classification purposes.
Affected media	Soil/fill is the affected medium. The potential for asbestos fibres to become airborne has also been considered. The potential for groundwater impacts in the vicinity of the UST area will be further considered as part of the validation. However, groundwater has not been identified as an affected medium for the purpose of remediation at this point.
Receptor identification	Human receptors include existing site occupants/users (including adults and children), and construction workers.
Potential exposure pathways	Potential exposure pathways relevant to the human receptors include ingestion, dermal absorption, inhalation of dust and vapours (volatile TRH/BTEXN) and inhalation of airborne asbestos fibres. Exposure could occur during construction or during on-going use of the site. In regards to asbestos fibres there is an increased risk of exposure via disturbance of the soil. Both bonded ACM and FA have been identified at the site, although it is noted that FA was not detected above the SAC (as reported by GHD).
Evaluation of Data Gaps	Areas beneath existing buildings have not been assessed and form a data gap. This data gap has been adequately considered in the RAP as outlined in Section 5.3.3. The sampling density during previous investigations was lower in the southern areas of the site. This will be addressed via the implementation of the unexpected finds protocol (Section 7.1).

3.2 Extent of Remediation

The proposed extent of remediation based on currently available data is shown on Figure 2 in Appendix A. The identified ACM remediation area is shown in red shading and the identified UST remediation area is shown in yellow shading. These areas have been discussed further below.

3.2.1 ACM in Fill

Asbestos (as ACM) concentrations in fill were only reported above the assessment criterion of 0.01%w/w in one sample from TP124, with a concentration of 0.0436%w/w. The anticipated extent of remediation of the ACM impacted zone is presented on Figure 2. This zone captures TP124 where ACM was identified above the screening criterion during the GHD Stage 1 Development Area Phase 2 ESA report 2018assessment. The horizontal extent of remediation in this area has been estimated based on the subsurface conditions and soil

results reported for the next closest sampling locations: BH104, BH212, BH113, BH112 and BH105 (refer to Figure 2). Based on the suspected source of the ACM impacts and the remedial approach outlined in the following sections, the nominal area of approximately 2,100m^2 is considered to be an adequate starting point. The final extent of remediation will be confirmed via the validation process.

3.2.2 USTs and Associated Infrastructure

The extent of remediation (horizontal and vertical) associated with the USTs and associated infrastructure is presented on Figure 2, however will ultimately be guided by the validation. It is anticipated that the tank pits could be approximately 2-3m deep.

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 NSW EPA Guidelines for Site Auditor Scheme, 3rd Edition 2017[9] 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.

In addition to the above, important considerations in assessing the acceptability of an asbestos remediation proposal (Western Australia Department of Health Guidelines for the Assessment, Remediation and Management of Asbestos Contaminated Sites in Western Australia, 2009[10]) includes:

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

4.2 Consideration of Remediation Options

The tables below outline a range of remediation options and their applicability to the site:

Table 4-1: Consideration of Remediation Options

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

[10] Western Australia Department of Health, (2009). Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia

Option	Discussion	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, licenses may be necessary for specific individual waste streams due to the potential for air pollution and the formation of harmful by-products during incineration processes. Licences for re-use of treated material/waste may also be required.	Physical removal of bonded asbestos materials in fill via hand picking is not suitable for buried ACM in fill. Bioremediation of hydrocarbon impacted soils associated with the USTs may be possible however this option is unlikely to be viable given the expected small volume of material potentially impacted.
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 for this project.
Option 3 **Consolidation and isolation of impacted soil by cap and containment**	This would include the placement of an appropriate barrier over the contaminated material to reduce the potential for future disturbance and therefore health risk to future site users. This action may also reduce the transport of contamination via surface water movement and dust generation. The capping and/or containment must be appropriate for the specific contaminants of concern. An ongoing Environmental Management Plan (EMP) would be required and the EMP would need to be publicly notified and made to be legally enforceable (e.g. via listings in the Section 10.7 planning certificate and on the land title).	Appropriate for ACM impacted fill. This option could be applied to areas of the site that require filling to generate proposed levels.
Option 4 **Removal of contaminated material to an appropriate facility and reinstatement with clean material**	Contaminated soils would be classified in accordance with NSW EPA guidelines for waste disposal, excavated and disposed of off-site to a licensed landfill. The material would have to meet the requirements for landfill disposal. Landfill gate fees (which may be significant) would apply in addition to transport costs.	Removal of ACM impacted fill is a viable approach considering the contaminant of concern (ACM) and the extent of bulk excavation in the impacted area. Removal of contaminated UST pit backfill soil and /or any water is a viable approach for the UST pit backfill soils and any water encountered due to the

Option	Discussion	Applicability
		expected contaminants of concern and the objective of the remediation.
Option 5 Implementation of management strategy	Contaminated soils or groundwater 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 capping solutions, together with monitoring programs for soil and groundwater.	Not applicable at this stage, however this could be considered further if required.

4.3 Preferred Options for Remediation

This RAP provides suitable options for remediation of the known contamination. The final remediation option to be applied for each contaminant/remediation zone should be outlined in a development phase specific RWP.

4.3.1 ACM in fill

There are two options that are suitable for remediation of ACM in fill: Option 4 which includes excavation and off-site disposal of contaminated fill/soil to a suitably licensed landfill, and/or Option 3 which includes consolidation and isolation of impacted material by cap and containment.

Option 4 is appropriate as it is understood the bulk excavation in the ACM impacted zone will extend vertically to depths of approximately 0.5mBGL to 2mBGL, and laterally to the cadastral site boundaries. Based on the depth of fill in this section of the site encountered during the previous assessments (approximately 0.2mBGL), the excavation for the bulk earthworks is expected to remove all fill from the zone by default.

Option 3 is considered to be appropriate on the basis that:

- ACM was only identified in fill at one location with a concentration that exceeded the most sensitive SAC. All other asbestos concentrations in the bulk field samples were less than the SAC;
- Relatively large car park areas and buildings low-sensitivity land uses are proposed over much of the remainder of the development area within the site. These areas are well suited for the construction of containment cells and are unlikely to be disturbed during future day-to-day site use; and

- This option is well suited to areas of the site that require filling, however restrictions would apply to the land and the site would need to be managed under a long-term Environmental Management Plan (EMP) (refer to Section 9).

A containment cell should not be placed in sensitives areas likes areas of landscaping and/or drainage lines.

Under either option, an Asbestos Management Plan (AMP) will be required for the remediation work and for all site works in the until the asbestos impacted fill is remediated.

4.3.2 USTs and Associated Infrastructure

The most viable option for remediation of the USTs and associated infrastructure is removal and disposal off-site to an appropriate facility (Option 4). Residual contamination from the UST may be impacting groundwater, based on the detection of ethyl-benzene in BH116 during the GHD 2018 assessment, therefore this option is considered to be the most viable under these circumstances.

5 REMEDIATION DETAILS

5.1 Roles and Responsibilities

Table 5-1: Roles and Responsibilities

Role	Responsibility
Client/Developer	NSW Health Infrastructure. The client is required to appoint the project team for the remediation and must provide all investigation reports including this RAP to the project manager, remediation contractor, consent authority and any other relevant parties involved in the project.
Project Manager	CBRE The project manager is required to review all documents prepared for the project and manage the implementation of the procedures outlined in this RAP. The project manager is to take reasonable steps so that the remediation contractor and others have understood the RAP and will implement it in its totality. The project manager will review the RAP and other documents and will update the parties involved of any changes to the development or remediation sequence (in consultation with the validation consultant). Further details are outlined in the sections below.
Remediation Contractor	To be appointed. The remediation contractor is required to review all 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 necessary documentation associated with the remediation activities and forward this documentation onto the client and project manager as they become available. Further details are outlined in the sections below.
Validation Consultant	Subject to formal engagement by contractor. (JKE able to act in this capacity). The validation consultant[11] provides consulting advice and validation services in relation to the remediation. The validation is required to prepare the RWP and validate the remediation. The validation consultant is to have a Licensed Asbestos Assessor on staff to provide the necessary surface clearance inspections and certificates for the project. The validation consultant is required to liaise with the client, project manager and remediation contractor on all matters pertaining to the site contamination, remediation and validation.

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) should be

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

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

Once development details are known for each phase of works, assessment of available data should be undertaken. The extent of remediation should then be identified within that development area and a RWP is to be prepared by the validation consultant in line with the framework set out in this RAP. Further details around what must be included in the RWP for a remedial approach for capping is provided in Section 5.3.5.

5.3 Remediation and Associated Tasks

The following general sequence of works is anticipated for each phase of the development:

- Site establishment;
- Demolition of structures;
- Supplementary waste classification sampling of fill from within building footprints;
- Remediation of USTs, associated infrastructure and any impacted soils/bedrock in this vicinity, and/or remediation of ACM impacted fill (as applicable); and
- Validation (some of which will run concurrently with remediation)

It is anticipated that remediation and validation will occur in stages. Stage validation is permissible under this RAP.

Details in relation to the above are outlined in the following subsections:

5.3.1 Site Establishment

The remediation contractor is to establish on site as required to facilitate the remediation. 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 works.

5.3.2 Demolition of Structures

The buildings are to be demolished with regards to the findings of the hazardous building materials survey undertaken by GHD (refer to Section 2.1.4) and in accordance with the relevant codes and standards. As part of this process, the grease trap identified in the wash down bay should be pumped out and demolished. All demolition waste from the buildings/structures are to be disposed off-site to facilities that are appropriately licensed to receive the waste.

It is recommended that demolition of the structures and removal of all hazardous materials occurs prior to demolition of the pavements so the demolition process does not impact the contamination status of the soils.

5.3.3 Supplementary Waste Classification (Fill)

Following demolition of the structures and removal of slabs and pavements, supplementary waste classification samples are to be collected in order to confirm the waste classification. The samples are to be

collected from a minimum of three location per building footprint or three per 300m^2. Additional samples are also to be collected if any visual or olfactory indicators of potential contamination are observed in other areas. The rational for the selection of the locations is based on the general building footprints.

Sampling is to be undertaken from test pits using an excavator. Sampling should occur from the fill, however the test pits are to extend to a depth of at least 0.5m into the natural soil in order to confirm the fill depths. Samples should be collected from the fill profiles based on field observations. Samples for chemical contaminants should be placed in glass jars with plastic caps and Teflon seals with minimal headspace. Samples for asbestos analysis should be placed in zip-lock plastic bags. A portable Photoionisation Detector (PID) fitted with a 10.6mV lamp should be used to screen the samples for the presence of volatile organic compounds (VOCs).

One sample per fill profile encountered (at each location) is to be analysed for heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), TRH/BTEX, PAHs, OCPs, OPPs, PCBs and asbestos (40-50g analysis). Toxicity characteristic leachate procedure (TCLP) analyses are to be undertaken as required and in accordance with the Waste Classification Guidelines 2014.

On completion, a waste classification report is to be prepared for the fill presenting the results of the waste classification. This report must also include consideration of all of the data collected for the Prelim Stage 2 ESA. As required by the NSW EPA[12], the waste classification report is 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 – 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% UCL;
- 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.

In addition, the waste classification data is to be compared to relevant human health and ecological-based screening/investigation levels presented in NEPM (2013) in order to confirm whether any additional remediation is required. In the event that contamination is identified that requires an increase in the scope of the remediation, the RWP for the development stage must reflect this.

[12] https://www.epa.nsw.gov.au/your-environment/waste/classifying-waste

5.3.4 Excavation and Off-site Disposal of ACM Impacted Fill

ACM impacted fill can either be excavated and disposed off-site, or capped and contained then managed under an EMP. The framework in this section of the RAP is for off-site disposal. Reference should be made to Section 5.3.5 for the cap and contain/manage option.

For the purpose of the procedure provided below, the fill within the ACM remediation zone (see Figure 2, Appendix A) is classified as and is to be excavated and disposed of as **General Solid Waste (non-putrescible) containing Special Waste (asbestos)** as per the data from the previous assessments.

Table 5-2: Remediation – Fill

Step	Primary Role/ Responsibility	Procedure
1.	Validation consultant	Preparation of AMP: Prior to commencement of work, an AMP is to be prepared for the remediation works. The AMP is to be implemented by the remediation contractor (and their nominated subcontractors where relevant) throughout the subsequent steps.
2.	Remediation Contractor	Address Stability Issues and Underground Services: Geotechnical advice should 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 temporary shoring. An Asbestos Removal Control Plan (ARCP) is to be prepared by the asbestos removalist/remediation contractor.
3.	Remediation Contractor / Asbestos Removal Contractor	Personal Protective Equipment (PPE) and Work Health and Safety (WHS): PPE and WHS requirements should be confirmed by the asbestos removal contractor prior to the commencement of works. All personnel involved in the remediation works must wear appropriate PPE as specified in the AMP/ARCP.
4.	Remediation contractor	Mark-out of remediation areas: The remediation contractor is to mark out the remediation areas using star pickets and flagged bunting. The areas should be easily identifiable based on the site features and can be marked out approximately using the scaled image attached as Figure 2 in Appendix A.
5.	Remediation contractor / Asbestos Removal Contractor (or their nominated sub-contractor) and validation consultant	Excavation and disposal of fill, followed by validation: Following pavement removal, remediation will be undertaken as follows: • Submit an application to dispose of the fill (in accordance with the assigned waste classification – see Section 5.3.3) to a facility that is appropriately licensed by the NSW EPA to receive the waste, and obtain authorisation to dispose; • The excavation and removal of asbestos contaminated soil should be completed in accordance with the NSW Government Code of Practice How to Manage and Control Asbestos in the Workplace (2019);

Step	Primary Role/ Responsibility	Procedure
		• Asbestos fibre air monitoring should be undertaken along the remediation area boundaries during the fill excavation works (at a minimum of four locations). Monitoring should commence prior to the start of works and continue daily for the duration of the remediation works; • A water system will need to be in place to spray the fill soil during excavation/remediation works and to wash down trucks exiting the work area. The general site area should be kept damp during remediation works; • Excavate the fill down to the surface of the underlying natural soil/bedrock. It is recommended that experienced personnel monitor this process so that fill is not 'over excavated' into natural soil which could result in additional and unnecessary landfill fees. The details of the excavation works will need to be agreed with the remediation contractor. The works should be done in the most efficient manner that minimises cross contamination; • Load the fill directly into trucks and dispose of the soil to a facility licensed by the NSW EPA to receive the waste (the landfill will require a copy of the waste classification report refer to Section 5.3.3); and • All documents including landfill disposal dockets should be retained by the remediation contractor/asbestos removal contractor and forwarded to the client and validation consultant. This documentation forms a key part of the validation process and is to be included in the validation report.
7.	Validation Consultant	<u>Validation of Fill Removal and Waste Classification of Natural Soil/Rock:</u> Following removal of the fill, the surface of the natural soil/rock is to be validated in accordance with the Validation Plan outlined in Section 6, which includes completion of a surface clearance by a licenced asbestos assessor. The waste classification is to be confirmed for natural material post validation of the remediation excavation and prior to the re-commencement of bulk excavation (refer to Section 6).

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

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

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

Asbestos waste cannot be re-used or recycled.

The detailed validation plan relevant to the above items is provided in Section 6.

5.3.5 Consolidation and Capping of ACM in Fill

ACM impacted fill can either be excavated and disposed off-site, or capped and contained then managed under an EMP. The framework in this section of the RAP is for cap and containment. Reference should be made to Section 5.3.4 for the excavation and disposal option.

Prior to remediation of the ACM impacted fill excavation via consolidation and isolation in a containment cell, the validation consultant (in consultation with the project manager and remediation contractor) is to prepare a RWP. 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 ACM-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 (e.g. pavements etc);
- 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 natural material (VENM) excavated to create the cell is preferably re-used to cap the cell;
- A specification for a clean soil cap over the cell of at least 500mm (however, it is noted that all underground services in the cell footprint are to be in the clean soil cap and not beneath impacted soils); 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 containment cell should not be placed in sensitives areas such as areas of extensive landscaping and/or drainage lines.

Considering the extent of remediation (Section 3.2), it is estimated that there may be in the order of ~4,200m^3 of soil to be excavated and contained within the cell.

The containment cell is to be constructed as outlined in the following table. The detailed validation plan relevant to this aspect of the remediation is provided in Section 6.

Table 5-3: Remediation – Consolidation and Capping of ACM Impacted Fill

Step	Primary Role/ Responsibility	Procedure
1.	Validation consultant	Waste Classification: Prior to commencement of excavation, the validation consultant is to undertake a waste classification assessment for any surplus materials to be excavated and disposed off-site during the cell construction that was not previously classified. Consideration is to be given to re-using site-won VENM (i.e. excavated to construct the cell) to cap the cell, as noted previously.
2.	Remediation contractor	Implementation of RWP to construct the cell: The cell is to be excavated/constructed in accordance with the RWP. As-built details for the cell are to be documented on construction drawings by the remediation contractor as noted in Section 6.
3.	Validation consultant	Preparation of AMP: Prior to commencement of work, an AMP is to be prepared for the remediation works. The AMP is to be implemented by the remediation contractor (and their nominated subcontractors where relevant) throughout the subsequent steps.
4.	Remediation contractor	Mark-out of remediation area: The remediation contractor is to mark out the remediation area using star pickets and flagged bunting. The areas should be easily identifiable based on the site features and can be marked out approximately using the scaled image attached as Figure 2 in Appendix A.
5.	Remediation contractor	Excavation and ACM-impacted fill: All fill is to be excavated from the remediation area to the full extent of remediation described in Section 3.2, loaded into dump trucks and transported for immediate placement into the containment cell. The remediation contractor is to keep a log to track the movement of materials to the cell. All works should be completed in accordance with the AMP.
6.	Validation consultant	Validation and surface clearance inspections/certificates: The validation consultant's nominated licenced Asbestos Assessor is to undertake a surface clearance inspection of the base and walls of each remediation area. Subject to a successful clearance inspection, a clearance certificate is to be provided. In the event that ACM is observed during the clearance, additional excavation is to be undertaken to 'chase-out' the ACM-impacted material in consultation with the validation consultant. The clearance inspection is then to be repeated as noted above. The surface clearance is to confirm that the base of the excavation includes only in-situ natural soil or rock and that all fill has been removed. Validation sampling is also required from the northern, western and southern walls as outlined Section 6. The collection of validation samples from the eastern wall is not required on the basis that the excavation extends to the full extent of the site boundary. In the event of surface clearance or validation failure, additional excavation is to be undertaken to 'chase-out' the ACM-impacted material in consultation with the validation consultant. The clearance inspection/validation sampling is then to be repeated as noted above.
7.	Remediation contractor /	Capping of cell: Following the completion of remediation and successful validation of the remedial excavation, the cell is to be capped in accordance with the RWP. The cap is to be

Step	Primary Role/ Responsibility	Procedure
	validation consultant	inspected by the validation consultant and all aspects of the work are to be surveyed by the remediation contractor to address the requirements of the RWP and the validation (Section 6).
9.	Remediation contractor / validation consultant	Backfilling of remedial excavations: Following the completion of remediation and successful validation of the remedial excavations, the excavations are to be backfilled (as required) using clean/validated material. Preference should be given to using surplus VENM excavated from the cell construction. The backfill should be adequately compacted to meet the relevant engineering specification for the project.

5.3.6 USTs, Associated Infrastructure and Impacted Soils/Bedrock

The USTs and associated infrastructure (i.e. underground pipe work, vent pipes etc, if still present) are to be removed from the site in accordance with the Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation (2019)[13], Guidelines for the Implementation of the Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2008 (2009)[14] (yet to be updated to reflect the new Regulation) and the Australian Standard for The Removal and Disposal of Underground Petroleum Storage Tanks (AS4976-2008)[15]. Reference is also to be made to the UPSS Technical Note: Decommissioning, Abandonment and Removal of UPSS (2010)[16] and the UPSS Technical Note: Site Validation Reporting (2010)[17].

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

Table 5-4: Remediation - USTs

Step	Primary Role/ Responsibility	Procedure
1.	Remediation contractor	Address Stability Issues and Underground Services: Geotechnical advice should be sought regarding the stability of the 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 temporary shoring. All underground services are to be appropriately disconnected or rerouted to facilitate the works.
2.	Remediation contractor	PPE and WHS: Confirm PPE and WHS requirements prior to commencement of remediation works. The minimum PPE required for the remediation includes the following: • Disposable gloves; • Hard hat;

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

Step	Primary Role/ Responsibility	Procedure
		• Covered clothing; and • Steel toed boots.
3.	Remediation contractor (or their nominated sub-contractor)	<u>Initial Preparation:</u> The pavement in the UST remediation area should be cut and removed with care using an excavator, or similar. An experienced contractor should be engaged for the removal of the USTs. Liquid and/or sludge within the UST and associated pipe work (if present) should be pumped out and disposed of lawfully by a licensed liquid waste operator.
4.	Remediation contractor (or their nominated sub-contractor) and validation consultant	<u>Removal of the USTs/infrastructure, impacted soils, followed by validation:</u> The USTs and associated infrastructure is 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 should be excavated and stockpiled separately (all stockpiles should be placed on the adjacent hardstand or heavy duty plastic sheeting with appropriate silt control). This material is to be validated as outlined in Section 6; • Depending on the result of the validation, the material may be suitable for reinstatement onsite or may require off-site disposal. Where the material requires off-site disposal, the material should be classified as outlined in Section 5.3.3 below and in accordance with the NSW Waste Classification Guidelines, Part 1: Classifying Waste (2014)[18]; • Submit an application to dispose of the backfill soil (in accordance with the assigned waste classification) to a landfill that is appropriately licensed by the NSW EPA 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 of material to extend the pits (say 0.5m initially) in the direction of the suspected impact. The validation consultant should 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 additional excavated material separately and undertake a waste classification as outlined in Section 5.3.3, then load the soil onto trucks and dispose in accordance with the assigned waste classification; • The validation consultant is to obtain validation soil samples from the walls and base of the excavation (see the Validation Plan in Section 6). In the event that groundwater is encountered at the base of the remedial excavation this should be validated in accordance with Section 6; and • Subject to successful validation, backfill the remedial excavation to make safe (i.e. profile to be in keeping with the surrounding site levels). All documents including landfill disposal dockets, UST disposal/destruction dockets, liquid waste disposal etc. should 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.

The detailed validation plan relevant to the above items is provided in Section 6.1.

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

5.4 Remediation Documentation

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

- Asbestos removal documentation, including licences, removal control plans, air monitoring results (where relevant), and surface clearance inspections;
- Soil disposal dockets (soil and liquid waste, and dockets for disposal of asbestos containing materials where relevant);
- UST destruction certificates;
- Photographs of remediation works; and
- Waste tracking documentation (where applicable).

Copies of these documents must be forwarded to the validation consultant on completion of the remediation for inclusion in the validation report.

5.5 Soil Disposal Volumes (Remediation)

A soil volume analysis should be undertaken on completion of the works and reconciled with the quantities shown on the soil disposal dockets. A review of the disposal facility's licence issued under the Protection of the POEO Act 1997 should also be undertaken to assess whether each facility is appropriately licensed to receive the waste.

The preliminary estimate for the excess cut soil volume for the project is approximately 1,660m^3 (surplus) which could equate to approximately 3,000 tonnes of soil. This estimate is preliminary only and should be confirmed by the client's quantity surveyor. The estimate is based on a tonnage conversion of 1.8 applied to the volume of the total cut volume of 17,015m^3 - the total fill volume of 15,355m^3. The quantities associated with the USTs have not be calculated and will depend on the outcome of the validation.

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 observations made during remediation.

6.1 Validation Sampling and Documents

The validation requirements for the site are outlined below:

6.1.1 Validation Requirements - Demolition of Structures

Table 6-1: Validation Requirements – Demolition of structures

Aspect	Sampling	Analysis	Observations and Documentation
Demolition of Structures (Section 5.3.2)			
Demolition of structures	As per the hazardous building materials report	As per the hazardous building materials report	Copy of hazardous building materials report to be provided to the validation consultant along with any monitoring and/or clearance reports from the demolition. Letter of compliance is required from the demolition contractor confirming that the demolition occurred with regards to the hazardous building materials report.

6.1.2 Validation Requirements – Supplementary Waste Classification

Table 6-2: Validation Requirements – Supplementary Waste Classification

Aspect	Sampling	Analysis	Observations and Documentation
Demolition of Structures (Section 5.3.3)			
Demolition of structures	Three locations per building (or equal to three per 300m^3). Samples to be collected from all fill profiles and underlying natural material.	Heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), TRH/BTEX, PAHs, OCPs, OPPs, PCBs and asbestos (40-50g analysis)	As required for waste classification reports. Assessment of data against NEPM (2013) HILs/HSLs.

6.1.3 Validation Requirements – Excavation and offsite Disposal of ACM in fill

Table 6-3: Validation Requirements – Excavation and Off-site Disposal of ACM in Fill

Aspect	Sampling	Analysis	Observations and Documentation
Validation of Excavation and Removal of Fill (Section 5.3.4)			
Northern, western and southern excavation walls	One bulk 10L sample per 5m (lineal) collected from each observed fill/soil profile. Screening for ACM through 7mm sieve in accordance with NEPM 2013.	Asbestos concentrations to be calculated as per NEPM 2013 requirements	RWP and AMP to be prepared by the validation consultant. Surface clearance inspections/certificates by the validation consultant. Bulk screening (excavation wall) validation results, including sample location plan, soil log for each wall location, photographs and soil results.
Surface of natural soil following removal of overlying fill.	If deemed necessary to confirm VENM classification. JKE are of the opinion that sampling is not necessary provided all fill is adequately removed and the observation and documentation requirements are met.	If deemed necessary to confirm VENM classification. JKE are of the opinion that analysis is not necessary provided all fill is adequately removed and the observation and documentation requirements are met.	Surface clearance to be provided by licensed asbestos assessor. Inspection to document that all fill has been removed and natural soil is exposed at the surface. Surface clearance to be provided by licensed asbestos assessor. Photographs to be taken. VENM classification to be provided for natural soil/bedrock. Horizontal extent of validated area to be surveyed by the earthworks contractor or clients chosen sub-contractor. Air monitoring results to be reviewed (if applicable).

6.1.4 Validation Requirements – Consolidation and Capping of ACM in Fill

Table 6-4: Validation Requirements – Consolidation and Capping of ACM in Fill

Aspect	Sampling	Analysis	Observations and Documentation
Consolidation and Capping of ACM Impacted Fill (Section 5.3.5)			
Northern, western and southern excavation walls	One bulk 10L sample per 5m (lineal) collected from each observed fill/soil profile. Screening for ACM through 7mm sieve in accordance with NEPM 2013.	Asbestos concentrations to be calculated as per NEPM 2013 requirements	RWP and AMP to be prepared by the validation consultant. Surface clearance inspections/certificates by the validation consultant. Bulk screening (excavation wall) validation results, including sample location plan, soil

Aspect	Sampling	Analysis	Observations and Documentation
			log for each wall location, photographs and soil results.
Surface of natural soil following removal of overlying fill.	If deemed necessary to confirm VENM classification. JKE are of the opinion that sampling is not necessary provided all fill is adequately removed and the observation and documentation requirements are met.	If deemed necessary to confirm VENM classification. JKE are of the opinion that analysis is not necessary provided all fill is adequately removed and the observation and documentation requirements are met.	Surface clearance to be provided by licensed asbestos assessor. Inspection to document that all fill has been removed and natural soil is exposed at the surface. Surface clearance to be provided by licensed asbestos assessor. Photographs to be taken. VENM classification to be provided for natural soil/bedrock. Horizontal extent of validated area to be surveyed by the earthworks contractor or clients chosen sub-contractor. Air monitoring results to be reviewed (if applicable).
Containment Cell	Not required	Not required	Waste classification documentation to be prepared by the validation consultant (as required), for surplus materials. Photographs to be documented. Material tracking log to be maintained by the remediation contractor, including all dates where works occur and the description of works undertaken. As-built details for the cell are to be documented on construction drawings by the remediation contractor and provided to the validation consultant. As a minimum these must include: - The location of the cell, including the cell boundary coordinates; - Invert levels (RLs) to the base of the cell and to the top of the ACM-impacted material placed within it; - Survey levels (RLs) demonstrating the placement of at least 500mm of clean soil capping over the top of the cell (on completion of filling as noted below); - The location and depth of any underground services in the cell footprint; and

Aspect	Sampling	Analysis	Observations and Documentation
			- Details regarding the constructed features over the cell (e.g. pavements, building slabs, landscaping etc).

6.1.5 Validation Requirements – USTs and Associated Infrastructure

Table 6-5: Validation Requirements – USTs and Associated Infrastructure

Aspect	Sampling	Analysis	Observations and Documentation
Remediation of USTs, Associated Infrastructure and Impacted Soils/Bedrock (Section 5.3.6)			
UST backfill	One sample per 25m^3, collected using hand equipment.	Heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), TRHs, BTEX, PAHs and asbestos.	RWP to be prepared by the validation consultant. Samples to be screened using PID. Observations of staining and odour to be recorded. Photographs to be taken. Disposal dockets to be retained.
UST pit chase out spoil (if required)	One sample per 25m^3, collected using hand equipment.	TRHs, BTEX and PAHs	As above.
UST pit – excavation base UST pit – excavation walls	Minimum of two samples per UST to be collected using the excavator after removal of the tank. One sample per excavation wall and per vertical metre. Additional sampling is also to target obvious indicators of contamination and changes in soil profile.	Lead, TRH/BTEXN	Samples to be screened using PID. Observations of staining and odour to be recorded. Photographs to be taken.
Infrastructure (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.

Aspect	Sampling	Analysis	Observations and Documentation
Groundwater (if encountered in excavation)	One 'grab' sample to be collected using a bailer.	Heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), TRHs, BTEX, and low level PAHs.	Observations of sheen and odour to be recorded.

6.1.6 Validation Requirements – Imported Materials – Relevant to all Works

Table 6-6: Validation Requirements – Imported Materials

Aspect	Sampling	Analysis	Observations and Documentation
Imported Materials – validation of imported materials is required for any materials imported onto the site during the remediation and to the point in time that the site validation report is prepared (e.g. temporary backfill, gravels for site preparation etc).			
Imported VENM backfill (if required) Imported garden mix/topsoil	Minimum of three samples per source	Heavy metals (as above), TRHs, BTEX, PAHs, OCP/OPP, PCBs and asbestos. Additional analysis may be required depending on the site history of the source property.	VENM documentation/report required (should include source site history to demonstrate analytes are appropriate). 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 or Excavated Natural Material (ENM)	Minimum of three samples per source/material type. Additional testing may be required for ENM to meet the specification within the ENM Order.	Heavy metals (as above), TRHs, BTEX, PAHs, OCP/OPP, PCBs and asbestos. Additional testing may be required for ENM (e.g. foreign materials, pH and electrical conductivity)	Documentation required to confirm material has been classified with reference to a relevant Resource Recovery Order/Exemption. Review of the facility's Environment Protection Licence (EPL). Material is to be inspected by the validation consultant upon importation to confirm it is free of visible/olfactory

Aspect	Sampling	Analysis	Observations and Documentation
		depending on available documentation.	indicators of contamination and is consistent with documentation. Dockets for imported material to be provided. Where check sampling occurs by the validation consultant due to deficiencies or irregularities in existing documentation, the following is required: - Date of sampling and description of material sampled; - An estimate of the volume of material imported at the time of sampling; - Sample location plan; and - Analytical reports and tabulated results with comparison to the VAC.
Imported engineering materials comprising only natural quarried products.	At the validation consultant's discretion based on robustness of supplier documentation.	At the validation consultant's discretion based on robustness of supplier documentation.	Documentation to be provided from the supplier confirming the material is a product comprising only VENM (i.e. natural quarried product). 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. Dockets for imported material to be provided. 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 tables below:

6.2.1 Supplementary Waste Classification

Table 6-7: VAC Supplementary Waste Classification

Validation Aspect (Section 5.3.3)	Criteria
All soil data	Health and ecological risks: Health-based Investigation Levels (HILs), Health-based Screening Levels (HSLs), Ecological Investigations Levels (EILs) and Ecological Screening Levels (ESLs) based on NEPM (2013) requirements. Management limits and direct contact limits for hydrocarbons to be considered as required. Waste: Data to be assessed against thresholds in Part 1 of the Waste Classification Guidelines (2014).

6.2.2 Excavation and Offsite Disposal of ACM Impacted Fill

Table 6-8: VAC Excavation and Offsite Disposal of ACM Impacted Fill

Validation Aspect (Section 5.3.4)	Criteria
Validation samples collected from walls	Asbestos is to be absent in all bulk samples collected from the walls of the remediation area. A risk-based approach for assessing asbestos/ACM concentrations in bulk samples can be considered following further consultation between the validation consultant and the client/project manager, with regards to the remediation objectives.
Surface clearance inspections / certificates	Confirmation that excavation base and walls are free of visible asbestos/ACM.

6.2.3 Consolidation and Capping of ACM Impacted Fill

Table 6-9: VAC – Consolidation and Capping of ACM Impacted Fill

Validation Aspect (Section 5.3.5)	Criteria
Validation samples collected from walls	Asbestos is to be absent in all bulk samples collected from the walls of the north-east remediation area. A risk-based approach for assessing asbestos/ACM concentrations in bulk samples can be considered following further consultation between the validation consultant and the client/project manager, with regards to the remediation objectives.
Surface clearance inspections / certificates	Confirmation that excavation base and walls are free of visible asbestos/ACM.
Cell cap	Survey to demonstrate that the clean soil cap across the top of the cell is at least 500mm thick.

6.2.4 USTs and Associated Infrastructure

Table 6-10: VAC – USTs and Associated Infrastructure

Validation Aspect (Section 5.3.6)	Criteria
Soil validation	<u>Remediation of USTs, Associated Infrastructure and Impacted Soils/Bedrock:</u> TRH/BTEXN = <PQL Lead = 50mg/kg The above VAC are nominated to demonstrate that the natural soils/bedrock around the USTs and associated infrastructure are not impacted by the contaminants of concern, in order to facilitate the VENM classification of the natural material to be excavated for the basement. For the surrounding materials to be classified as VENM, none of the soils/bedrock can be stained or odorous, and all of the overlying fill is to be removed. The presence of odours or exceedances of the VAC may compromise the VENM classification. However, from a risk perspective in the context of the proposed land use, such traces are unlikely to result in an unacceptable risk to future site users. In the event that persistent traces of TRH/BTEXN are reported above the VAC, these concentrations can be assess in the context of human health risks, in accordance with Schedule B1 of NEPM (2103) and an alternative classification (other than VENM) would need to be pursued for this material prior to the commencement of the bulk earthworks excavation.
Waste classification (backfill/chase out soils associated with remediation of USTs)	In accordance with the procedures and criteria outlined in Part 1 of the Waste Classification Guidelines 2014 and any other exemptions/approvals as required.

6.2.5 Imported Materials – Relevant to all Works

Table 6-11: VAC – Imported Materials

Validation Aspect	Criteria
Imported materials	Material imported as general fill must only be VENM or ENM. Results for VENM and other imported materials will need to be consistent with expectations for those materials. For VENM analysis, it is expected that: - Heavy metal concentrations are to be less than the most conservative Added Contaminant Limit (ACL) concentrations for an urban residential and public open space exposure setting presented in Schedule B1 of the NEPM 2013; and - Organic compounds are to be less than the laboratory Practical Quantitation Limits (PQLs) and asbestos to be absent. Recycled materials are to meet the criteria of the relevant exemption/order under which they are produced. Landscaping materials will be initially assessed against the same criteria as for VENM. In the event of validation failure (which is likely for organics such as PAHs and TRHs), a risk-based assessment approach could be adopted, subject to the validation consultant consulting with the Site Auditor.

Validation Aspect	Criteria
	Aesthetics: soils to be free of staining and odours.

6.3 Validation Report

As part of the 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 NSW OEH Guidelines for Consultants Reporting on Contaminated Sites (2011), or the relevant guidelines applicable at the time of remediation (noting that the Consultants Reporting Guidelines are currently being revised and are out for public consultation).

6.4 Data Quality

Appropriate QA/QC samples should be obtained during the validation (where applicable) and analysed for the same suite of contaminants as the primary samples. As a minimum, QA/QC sampling should include duplicates (5% inter-laboratory and 5% intra-laboratory), trip spikes and trip blanks. Rinsate samples should be obtained if re-usable sampling equipment is utilised.

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 should be established for the validation with regards to the seven-step process outlined NEPM (2013). The seven steps include the following:

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

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

7 CONTINGENCY PLAN

A review of the proposed remediation works has indicated that the greatest risk that may affect the success of the remediation is an unexpected find. A contingency plan for unexpected finds is outlined below, in conjunction with a selection of other contingencies that may apply to this project.

7.1 Unexpected Finds

Residual hazards that may exist at the site would generally be expected to be detectable through visual or olfactory means. At this site, these types of hazards may include friable types of asbestos in soil or odorous/stained hydrocarbon impacted soils outside the UST Remediation area.

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 validation consultant should be contacted;
- Temporary barricades should be erected to isolate the area from access to workers;
- In the event suspected friable asbestos material is encountered, the validation consultant is to be contacted (the validation consultant will have an in-house hygienist or asbestos assessor);
- An additional sampling and analytical rationale should be established by the validation consultant and should be implemented with reference to the relevant guideline documents;
- The validation consultant should then assess the extent of remediation that may be required and consultation between the consultant, site auditor and other stakeholders should occur;
- In the event remediation is required outside the purview of the RWP an addendum RWP should be prepared and submitted to the consent authority for approval; and
- Appropriate validation sampling should be undertaken and the results should be included in the validation report.

7.2 Soil Validation Failure

In the event of a soil validation failure, the excavation should be extended in the direction of the failure (in consultation with the validation consultant) and the area re-validated.

7.3 Importation Failure for VENM or Other Imported Materials

Where material to be imported onto the site does not meet the importation acceptance criteria detailed in Section 6.2, the material should not be accepted unless it can be demonstrated that the material poses a negligible risk to human health and the environment, and the use of the material on-site is not contrary to relevant legislation and guidance regarding waste and resource recovery.

7.4 Disposal of Hazardous Waste

Material classed as ‘Hazardous Waste’ under the Waste Classification Guidelines (2014) may require further assessment and stabilisation prior to off-site disposal. Disposal approval may also be required from the licensed landfill facility. The presence of Hazardous Waste may result in significant delays and additional cost to the project.

7.5 Potential Groundwater Impacts – UST Area

In the event that the soil validation and visual observations for the UST remediation area indicate there is a potential for impacts to groundwater that may pose a risk to the receptors, a supplementary investigation is to be designed and implemented by the validation consultant to assess risks posed by groundwater contamination in the context of the proposed development. As a minimum, the investigation would need to include the installation of three appropriately designed groundwater monitoring wells, development of the wells to remove any water disturbed during the installation, low flow sampling, laboratory analysis for the contaminants of concern, then documentation of an appropriate risk assessment.

In the event that the risk assessment identifies unacceptable risks, a supplementary RAP or RWP will need to be prepared to outline the remediation and validation required for groundwater.

8 SITE MANAGEMENT PLAN FOR REMEDIATION WORKS

The information outlined in this section of the RAP is for the remediation work only and should be implemented concurrently with any other requirements outlined in the development consent/ approval.

An AMP should be prepared to manage the risks to receptors during the remediation works and to manage the ACM and low concentrations of FA at the site. The AMP should be implemented concurrently with the site management plan.

8.1 Asbestos Controls and Licensing Requirements

The following requirements should be met for the asbestos remediation works at the site:

- A Class B licensed asbestos removalist should be engaged to undertake the excavation/removal works. The licenced contractor is to prepare an ARCP for the site works;
- SafeWork NSW are to be notified prior to excavation works (minimum 5 business days);
- All personnel and contractors must be informed of site conditions, asbestos work areas and any exclusion zones;
- Mandatory air monitoring is to be undertaken on a daily basis during excavation works and all readings are to be below the detection limit of 0.01 fibres per millilitre. The requirement for daily air monitoring has been set due to the 'friable' nature of the asbestos, the sensitive land use within the site, the highly visible nature of the site within a residential area and duty to eliminate or minimise exposure to airborne asbestos and so that the exposure standard of 0.01 fibres/ml is not exceeded. The requirement for air monitoring during the ACM remediation will be at the discretion of the removal contractor;
- Asbestos clearance certificate/s should be provided by a SafeWork NSW licensed asbestos assessor following the removal of all asbestos impacted fill material from the site. JKE note that validation sampling is required; and
- The site is managed in accordance with this plan, the AMP and the general requirements of SafeWork NSW and strategies outlined in the relevant regulations, guidelines, codes and standards.

8.2 Interim Site Measures

The following interim measures should be adopted immediately:

- Construct fencing as required to secure the remediation areas; and
- Appropriate warning signage should be erected as required.

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 on the next page.

Table 8-1: Project Contacts

Task	Company	Contact Details
Project Manager	CBRE	(02) 9333 3333
Remediation Contractor	To be appointed	-
Asbestos Removal Contractor	To be appointed	-
Environmental / Validation Consultant	Subject to formal engagement by contractor (JKE able to act in this capacity)	(02) 9888 5000
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 and isolate the remediation area/s. Warning signs should be erected, which outline the PPE required for the specific remediation work.

8.5 Timing and Sequencing of Remediation Works

The anticipated sequence of remediation works is outlined in Section 5.3. This is to be confirmed in each RWP. It is anticipated that remediation and validation will occur in stages. Stage validation is permissible under this RAP.

8.6 Site Soil and Water Management Plan

The contractor should prepare a detailed soil and water management plan prior to the commencement of site works. 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 in the river 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.

8.7 Noise and Vibration Control Plan

The guidelines for minimisation of noise on construction sites outlined in AS-2460 (2002)[19] 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;
- Loading or unloading of dry soil as close as possible to stockpiles to prevent spreading of loose material around the development area; and
- The expanse of cleared land should be kept to a minimum to achieve a clean and economical working environment. 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.

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

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 Waste Classification Guidelines.

8.9 Temporary Dewatering

Temporary dewatering is not anticipated to be required as part of the remediation works. If a rain event occurs during the UST area remediation that triggers a need to remove water from the excavations/tank pits, this water should be assessed then pumped out by a liquid waste contractor. This water should not be pumped to stormwater or sewer unless a prior application is made and this is approved by the relevant authorities.

Reference should be made to the development consent for temporary construction dewatering requirements during the construction activities as this may be required concurrently with the basement construction/excavation.

8.10 Air Monitoring

Reference is to be made to the AMP for details regarding asbestos air fibre monitoring. 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)].

The 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 land users 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 Work Health and Safety (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 for asbestos works. 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 by the site. This should, as a minimum, include measures to recycle and re-use natural excavated material wherever possible.

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, 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 consent authority under the development approval process.

9 LONG TERM ENVIRONMENTAL MANAGEMENT PLAN (EMP)

Where any contaminated material is retained on site (refer to Section 5.3.5), an EMP will be required and will include (as a minimum) the following:

- Site details;
- Site description;
- A brief summary of the site history, investigations and remediation;
- A description of the contaminant of concern (i.e. asbestos) and the contamination extent;
- Information on the exposure pathways for the contaminant;
- A detailed description of the final capping system. This will include the survey co-ordinates of the burial cells; descriptions and photographs of the capping system; dimensions of the capping system; dimensions of the containment cells; plans showing locations; and representative cross sections through the capping system/cells;
- A Management Plan for ongoing maintenance of the capping layer (including inspection requirements);
- A contingency plan to be implemented in the event that the capping layer has to be disturbed or penetrated (e.g. installation of new services);
- An inspection protocol for the capping system. Apart from visual inspections no active ongoing monitoring (i.e. sampling of soil, water or air) would be required.
- Nomination of a timeframe for periodic review of the EMP;
- Requirement for public notification of the EMP;
- Nomination of a primary point of contact;
- Nomination of roles and responsibilities of stakeholders; and
- A statement to the effect that the containment system provides a suitable barrier to eliminate the potential exposure pathway for asbestos during day to day use.

JKE recommend that early engagement be undertaken with the consent authority and any other relevant stakeholders so that the EMP can be publicly notified and enforceable.

10 CONCLUSION

JKE are of the opinion that the site can be made suitable for the proposed development described in Section 1.1 provided this RAP is implemented accordingly. A site validation report, should be prepared on completion of remediation activities and should be submitted to the consent authority to demonstrate that the site (or each development stage) is suitable for the intended landuse.

10.1 Remediation Category

Site remediation can fall under the following two categories outlined in SEPP55:

Table 10-1: Remediation Category

Category	Details
Category 1	Category 1 remediation works are those undertaken in the following areas specified under Clause 9 of SEPP55: • A designated development; • Carried out on land declared to be a critical habitat; • Development for which another state or regional environmental planning policy requires a development consent; or • Carried out in an area or zone classified as: ➢ Coastal Protection; ➢ Conservation or heritage conservation; ➢ Habitat protection, or habitat or wildlife corridor; ➢ Environmental protection; ➢ Escarpment, escarpment protection or preservation; ➢ Floodway or wetland; ➢ Nature reserve, scenic area or scenic protection; etc. • Work that is not carried out in accordance with the site management provisions contained in the consent authority Development Control Plan (DCP)/Local Environmental Plan (LEP) etc. Approval is required from the consent authority for Category 1 remediation work. The RAP needs to be assessed and determined either as part of the existing development application or as a new and separate development application. Category 1 remediation work is identified as advertised development work unless the remediation work is a designated development or a state significant development.
Category 2	Remediation works which do not fall under the above category are classed as Category 2. Development consent is not required for Category 2 remediation works, however the consent authority should be given 30 days' notice prior to commencement of works.

The client should seek advice from their planning consultant regarding the appropriate category. Council should be notified of the proposed remediation works prior to commencement.

10.2 Regulatory Requirements

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

Table 10-2: Regulatory Requirement

Guideline	Applicability
SEPP55	Adequate notification is to be provided for remediation in accordance with SEPP55. Under Clause 17 of SEPP55, a notice of completion of remediation work is to be given to council within 30 days of completion of the work. The notice of completion of remediation works must be in accordance with Clause 18 of SEPP55.
Duty to Report Contamination (2015)	At this stage, JKE consider that there is no requirement to notify the NSW EPA of the site contamination. This requirement should be reassessed following review of the validation results, including the asbestos air monitoring data.
Protection of the Environment Operations Act 1997	Section 143 of the Protection of the Environment Operations 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 relevant waste that is disposed off-site. Asbestos waste must be tracked using WasteLocate.
POEO (Waste) Regulation 2014	Part 7 of the POEO Waste Regulation 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. Clause 78 of the POEO Waste Regulation requires that a person who transport asbestos waste must ensure that: • Any part of any vehicle in which the person transports the waste is covered, and leak-proof, during the transportation; and • If the waste consists of bonded asbestos material—it is securely packaged during the transportation; and • If the waste consists of friable asbestos material—it is kept in a sealed container during transportation; and • If the waste consists of asbestos-contaminated soils—it is wetted down. Asbestos waste in any form must not be re-used or recycled.
SafeWork NSW Code of Practice: How to manage and control asbestos in the workplace (2019)	Sites with asbestos become a 'workplace' when work is carried out there and require a register and AMP. Appropriate SafeWork NSW notification will be required for asbestos removal works or handling. Contractors are also required to be appropriately licensed for the asbestos works undertaken (i.e. Class B licence for non-friable/bonded asbestos work).

Guideline	Applicability
UPSS Technical Note: Site Validation Reporting (2010)	The validation report must be submitted to the local authority (usually council) within 60 days of completion of the validation/remediation work.

11 LIMITATIONS

The report limitations are outlined below:

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

Important Information About This Report

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

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

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

JKE will not accept any responsibility whatsoever for situations where one or more of the above factors have changed since completion of the 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

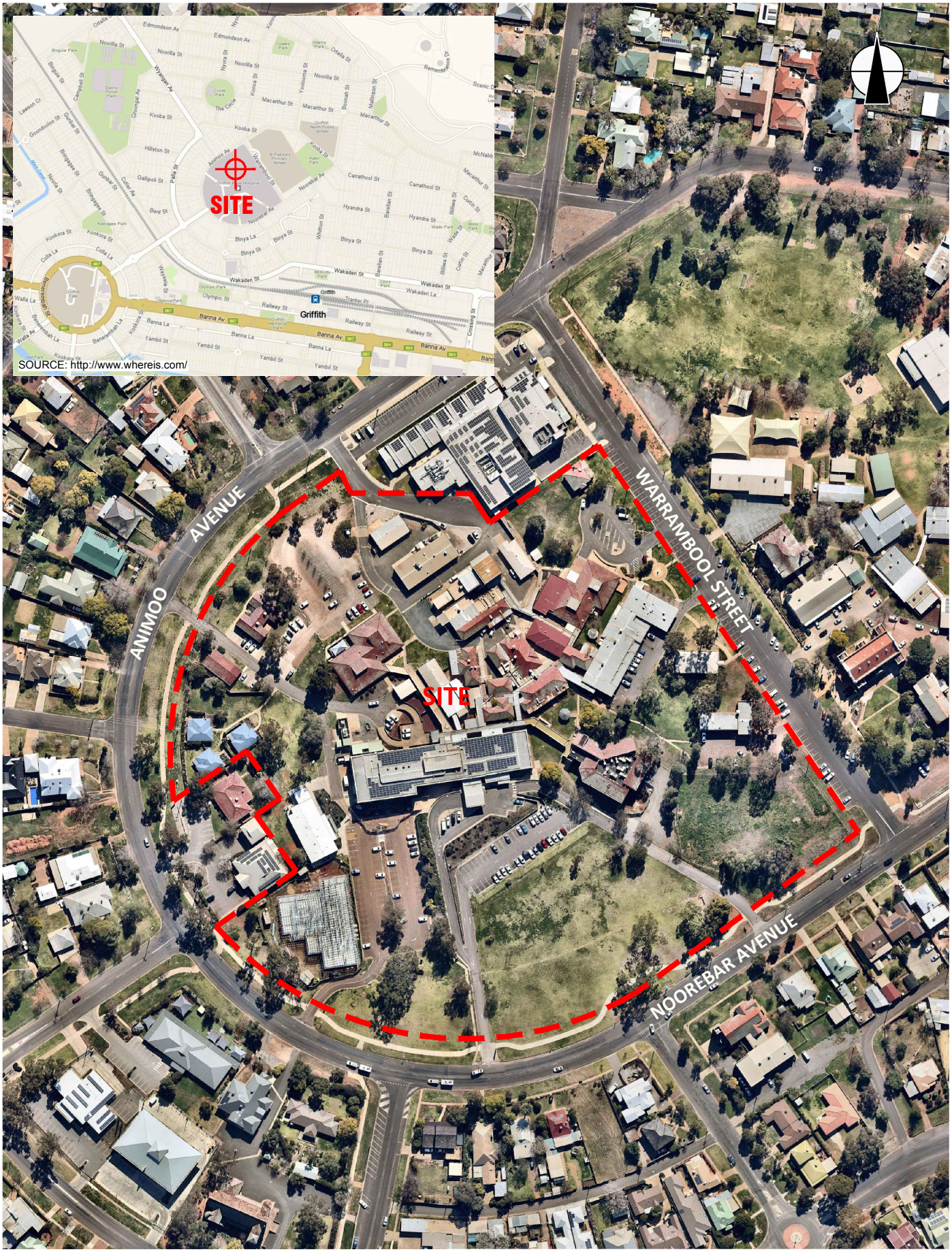
Borehole and test pit logs are prepared by environmental scientists, engineers or geologists based upon interpretation of field conditions and laboratory evaluation of field samples. Logs are normally provided in our reports and these should not be re-drawn for inclusion in site remediation or other 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: Report Figures



AERIAL IMAGE SOURCE: MAPS.AU.NEARMAP.COM

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

Title: **SITE LOCATION PLAN**

Location: GRIFFITH REGIONAL HEALTH SERVICE, 1 NOOREBAR AVENUE, GRIFFITH, NSW

Project No: E30991BTrpt3

Figure: 1

JKEnvironments

PLOT DATE: 6/04/2020 11:11:52 AM DWG FILE: Z:\5 EIS\5C- EIS JOBS\30000\SIE30991KH GRIFFITH\CAD\E30991BTRPT3\E30991BTRPT3.DWG

TP124 (0.0-0.1)	ACM
Asbestos	0.0436%

BH101(0.15)
BH114(0.2)
BH211(0.0)
BH210(0.0)
BH100(0.25)
BH13(0.0)
IP130(0.2)
IP131(0.4)
BH116(0.3)
TP125(0.1)
BH209(0.2)
BH104(0.4)
BH207(0.1)
IP133(0.6)
BH212(0.2)
BH115(0.2)
IP134(0.5)
BH208(0.3)
TP124(0.1)
BH205(0.2)
IP135
BH213(0.2)
IP132(0.2)
IP137(0.2)
136
BH206(0.9)
BH204(0.2)
BH113(0.2)
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BH14(0.25)
BH103(0.2)
BH105(0.2)
IP140(0.2)
BH214(0.3)
TP123(0.1)
IP139(0.2)
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BH102
BH215(0.5)
IP141(0.4)
BH216(0.6)
BH106(0.2)
BH202(0.7)
TP122(0.1)
BH108(0.2)
BH217(0.3)
BH111(0.2)
BH201(0.4)
BH107(0.4)
BH11(0.0)
BH12(0.0)
BH5(0.5)
TP121(1.1)
TP120(0.2)
BH4(0.0)
BH110(0.2)
IP142(0.2)
BH109(0.25)
BH6(0.2)
BH3(0.0)
BH9(0.2)
BH10(0.0)
IP143(0.6)
BH2(0.45)
BH7(0.0)
BH8(0.0)
BH1(0.1)

LEGEND

	APPROXIMATE SITE BOUNDARY
BH201(m)	BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (M) BH201 TO BH217 WERE DRILLED AS PART OF THE CURRENT JKE INVESTIGATION.
BH101(m)	BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (M) BH100 TO BH116 DRILLED AS PART OF THE 2018 GHD INVESTIGATIONS.
BH116(m)	GROUNDWATER MONITORING WELL LOCATIONS, NUMBER AND DEPTH OF FILL (M) BH116 DRILLED AS PART OF THE 2018 GHD INVESTIGATIONS.
IP130(m)	BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (M) IP130 TO IP142 DRILLED AS PART OF THE 2018 GHD INVESTIGATIONS.
TP120(m)	TEST PITS LOCATION, NUMBER AND DEPTH OF FILL (M) TP120 TO TP121 EXCAVATED AS PART OF THE 2018 GHD INVESTIGATIONS.
BH1(m)	BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (M) BH1 TO BH14 DRILLED AS PART OF THE NOVEMBER 2017 EIS INVESTIGATION.
	ACM REMEDIATION ZONE
	UST REMEDIATION ZONE

0 15 30 45 60 75
SCALE 1:1500 @A3 METRES

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

Title: **REMEDIATION ZONES**

Location: GRIFFITH REGIONAL HEALTH SERVICE, 1 NOOREBAR AVENUE GRIFFITH, NSW

Project No: E30991BTrpt3 Figure: 2

JKEnvironments

PLOT DATE: 6/04/2020 11:11:02 AM DWG FILE: Z:\5 EIS\5C EIS JOBS\30000'S\E30991KH GRIFFITH\CADIE30991BTRPT3\E30991BTRPT3.DWG

Appendix B: Proposed Bulk Earthworks Plans

BULK EARTHWORKS NOTES

1. SURVEY

a. SURVEY DATUM
THESE PLANS ARE BASED UPON THE EXISTING CONDITIONS SURVEY PREPARED BY THE FOLLOWING:
- SITE SURVEY SUPPLIED BY 'VERIS' REGISTERED SURVEYORS - PROJECT No. 17362.00 , REVISION A DATED 24/01/18.
- EXISTING SERVICES FROM SITE SURVEY SUPPLIED BY 'VERIS' REGISTERED SURVEYORS - PROJECT No. 201966 , DRAWING No. 201966-UTILS-001A, DATED 26/03/20

LEVELS SHOWN ARE TO A.H.D.

b. SETOUT
THE CONTRACTOR SHALL SETOUT THE WORKS FROM THE NOMINATED DESIGN LINES, SURVEY BENCHMARKS AND CONTROL POINTS SHOWN ON THE PLANS AND TO THE SPECIFIED DETAILS.

c. REFERENCES PROTECTION
THE CONTRACTOR SHALL MAINTAIN AND PROTECT THE PEGS AND SURVEY MARKS FOR THE DURATION OF THE WORKS.

2. EARTHWORKS

a. GENERAL
EARTHWORKS SHALL BE CARRIED OUT TO THE FINISHED SURFACE LEVELS SHOWN ON THE PLANS.

b. SUBGRADE PREPARATION/FILLING
THE FILL/SAND SUBGRADE SHOULD BE COMPACTED WITH A HEAVYWEIGHT VIBRATING ROLLER. A MINIMUM DRY DENSITY RATIO OF 98% OF THE MAXIMUM DRY DENSITY SHOULD BE ACHIEVED AT THE SURFACE.
WEAK OR UNSTABLE AREAS THAT DO NOT MEET THE COMPACTION STANDARD MUST BE EXCAVATED TO A MINIMUM DEPTH OF 500mm AND REPLACED WITH SELECTED FILL.
SELECTED FILL SHOULD BE PLACED IN UNIFORM LAYERS NOT EXCEEDING 200mm LOOSE AND THEN COMPACTED TO A DRY DENSITY RATIO OF 98% WITHIN THE RANGE OF 85% TO 115% OF THE OPTIMUM MOISTURE CONTENT

c. VOLUMES ARE APPROXIMATE ONLY AND DO NOT INCORPORATE BULKING FACTORS AND OVER EXCAVATION. VOLUMES HAVE BEEN CALCULATED BETWEEN STRIPPED SURFACE LEVELS AND BULK EARTHWORKS LEVELS.

d. GROUND WATER SEEPAGE MAY OCCUR IN EXCAVATED AREAS. DE-WATERING MAY BE REQUIRED IN THIS INSTANCE.

e. THIS DRAWING ONLY DETAILS EXCAVATION ASSOCIATED WITH THE BUILDING SLAB AND LIFT CORE FOOTINGS (IGNORING STRUCTURAL FOOTINGS UNO, BEAMS AND COLUMNS). IN ADDITION TO MAKING NO ALLOWANCE FOR TRENCH BACKFILL, TREE ROOTBALLS OR DETAILED EXCAVATION.

f. THE EXCAVATED MATERIAL IS TO BE TEMPORARILY STOCKPILED WITHIN THE LANDSCAPED AREAS (TO BE CONFIRMED ON-SITE) AND RE-USED AS LANDSCAPING SOIL BUILD-UP IN ACCORDANCE WITH LANDSCAPE ARCHITECTS SPECIFICATIONS.

g. REFER TO ARBORIST REPORT FOR TREE PROTECTION MEASURES IF REQUIRED.

h. 500mm ZONE OFFSET FROM BUILDING HAS BEEN ALLOWED FOR FORM WORK AND SCAFFOLDING WHERE SPECIFIED UNO.

i. PROVIDE TEMPORARY MAXIMUM 1 IN 1 BATTERS U.N.O. GEOTECH TO CONFIRM BATTER ACCEPTABILITY DURING CONSTRUCTION.

3. SITE CLEARANCE

a. DEMOLITION CLEAN UP
PRIOR TO COMPLETION, THE CONTRACTOR SHALL ENSURE THE SITE OF WORKS IS TIDIED AND OBTAIN A CLEARANCE FROM THE SUPERVISING ENGINEER OR PROJECT MANAGER.

4. TESTING

a. DATA
THE CONTRACTOR SHALL SUPPLY WRITTEN TEST RESULTS FROM A NATA REGISTERED GEOTECHNICAL ENGINEER CONFIRMING COMPLIANCE WITH THE SATISFACTIONS FOR ALL EARTHWORKS.

b. AUDIT
TEST RESULTS WILL BE REVIEWED BY THE SUPERINTENDENT AND WHERE SO REQUIRED ADDITIONAL TESTS WILL BE PROVIDED BY THE CONTRACTOR TO THE SUPERINTENDENT'S SATISFACTION.

5. SERVICES

a. EXISTING
ALL STATUTORY AUTHORITY SERVICES MUST BE MAINTAINED AND PROTECTED BY THE CONTRACTOR AT ALL TIMES UNLESS OTHERWISE SHOWN. EXISTING SERVICE LOCATIONS SHOWN HAVE BEEN OBTAINED FROM STATUTORY AUTHORITY RECORDS AND/OR SITE PLANS WHERE AVAILABLE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN AND ALL SERVICES SHOULD BE PROVEN ON SITE PRIOR TO THE COMMENCEMENT OF WORKS IN THEIR VICINITY.

6. DRAINAGE

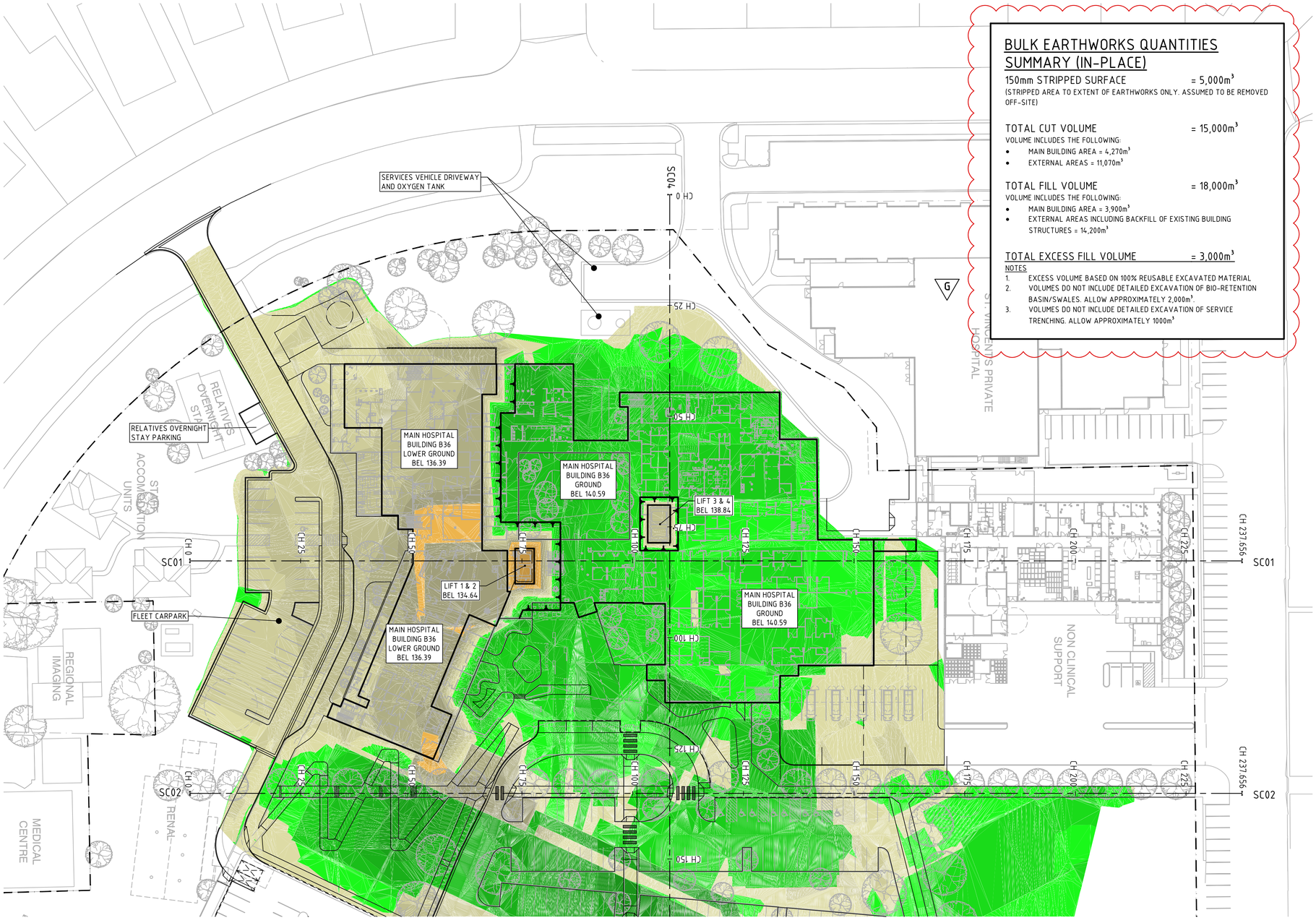
a. GENERAL
THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING TEMPORARY DRAINAGE.

b. EXISTING
EXISTING DRAINS ARE TO BE RETAINED WHERE POSSIBLE TO ENSURE THE SITE IS ABLE TO BE DRAINED. THEY SHOULD ONLY BE REMOVED WHEN THEY ARE NO LONGER REQUIRED.

c. TEMPORARY
THE CONTRACTOR SHALL ENSURE THAT THE SITE REMAINS FREE DRAINING DURING THE COURSE OF THE WORKS.

BULK EARTHWORKS DEPTH RANGE

CUT LOWER		CUT UPPER	CUT COLOUR	FILL LOWER		FILL UPPER	FILL COLOUR
-4.0	to	-3.5		0	to	0.5	
-3.5	to	-3.0		0.5	to	1.0	
-3.0	to	-2.5		1.0	to	1.5	
-2.5	to	-2.0		1.5	to	2.0	
-2.0	to	-1.5		2.0	to	2.5	
-1.5	to	-1.0		2.5	to	3.0	
-1.0	to	-0.5		3.0	to	3.5	
-0.5	to	0					



BULK EARTHWORKS QUANTITIES SUMMARY (IN-PLACE)

150mm STRIPPED SURFACE = 5,000m³
(STRIPPED AREA TO EXTENT OF EARTHWORKS ONLY. ASSUMED TO BE REMOVED OFF-SITE)

TOTAL CUT VOLUME = 15,000m³
VOLUME INCLUDES THE FOLLOWING:
- MAIN BUILDING AREA = 4,270m³
- EXTERNAL AREAS = 11,070m³

TOTAL FILL VOLUME = 18,000m³
VOLUME INCLUDES THE FOLLOWING:
- MAIN BUILDING AREA = 3,900m³
- EXTERNAL AREAS INCLUDING BACKFILL OF EXISTING BUILDING STRUCTURES = 14,200m³

TOTAL EXCESS FILL VOLUME = 3,000m³

NOTES
1. EXCESS VOLUME BASED ON 100% REUSABLE EXCAVATED MATERIAL
2. VOLUMES DO NOT INCLUDE DETAILED EXCAVATION OF BIO-RETENTION BASIN/SWALES. ALLOW APPROXIMATELY 2,000m³.
3. VOLUMES DO NOT INCLUDE DETAILED EXCAVATION OF SERVICE TRENCHING. ALLOW APPROXIMATELY 1000m³

FOR CONTINUATION REFER TO SHEET B36-0012

HEALTH AND SAFETY

H1. THE OBLIGATION OF BONACCI GROUP PTY LTD (OR OTHER RELEVANT BONACCI ENTITY) (BONACCI) AS THE DESIGN ENGINEER IS LIMITED TO ENSURING THAT THOSE PARTS OF THE BUILDING OR STRUCTURE THAT ARE TO BE USED AS A WORKPLACE ARE, AS FAR AS REASONABLY PRACTICABLE, DESIGNED TO BE SAFE AND WITHOUT RISKS TO THE HEALTH OF THOSE PERSONS USING THE BUILDING OR STRUCTURE AS A WORKPLACE FOR THE PURPOSE FOR WHICH IT WAS DESIGNED IN ACCORDANCE WITH SECT. 28 OF THE OCCUPATIONAL HEALTH AND SAFETY ACT 2004 (VIC).

H2. BONACCI IS NOT RESPONSIBLE FOR THE OCCUPATIONAL HEALTH AND SAFETY OF PERSONS AT THE SITE AS THOSE OBLIGATIONS RESIDE WITH THE CONTRACTORS AND/OR SUB-CONTRACTORS WHO OCCUPY OR HAVE CONTROL OF THE SITE IN ACCORDANCE WITH APPLICABLE OCCUPATIONAL HEALTH AND SAFETY LEGISLATION, CODES OR PRACTICE, GUIDANCE NOTES, AUSTRALIAN STANDARDS AND OTHER RELEVANT DOCUMENTATION.

H3. ANY ADVICE OR GUIDANCE CONCERNING OCCUPATIONAL HEALTH AND SAFETY ISSUES ARISING AT THE SITE SHOULD BE DIRECTED TO THE HEALTH AND SAFETY EXECUTIVE OR OFFICER NOMINATED FOR THE PROJECT.

THE CONTRACTOR SHALL BE TOTALLY RESPONSIBLE FOR AND AT ALL TIMES PROVIDE A SAFE WORKING ENVIRONMENT IN THE VICINITY OF THE SITE OF WORKS IN FULL COMPLIANCE WITH THE OCCUPATIONAL HEALTH AND SAFETY REGULATIONS.

NOT FOR CONSTRUCTION

DIAL 1100 BEFORE YOU DIG

ALL EXISTING PROPERTY SERVICES' LOCATIONS AND DEPTHS ARE APPROXIMATE AND MUST BE VERIFIED ON SITE.
THE CONTRACTOR SHOULD SUPPLY PRECISE LOCATIONS AND DEPTHS TO THE ENGINEER FOR REVIEW PRIOR TO ANY WORKS THAT MAY AFFECT THESE SERVICES.

WARNING
NO DRAINAGE WORKS SHALL COMMENCE UNTIL THE CONTRACTOR CONFIRMS THE I.L. OF ALL EXISTING DRAINS, AND CONFIRMS IN WRITING WITH THE ENGINEERING SUPERVISOR.

WARNING
BEWARE OF UNDERGROUND SERVICES
THE LOCATIONS OF UNDERGROUND SERVICES SHOWN ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE.

Rev	Description	Date	By	App
E	80% DESIGN DEVELOPMENT ISSUE	31.07.20	HM	-
D	70% DESIGN DEVELOPMENT ISSUE	19.06.20	HM	-
C	50% DESIGN DEVELOPMENT ISSUE	14.05.20	HM	-
B	100% SCHEMATIC DESIGN ISSUE	10.02.20	JF	-
A	100% SCHEMATIC DESIGN ISSUE	31.01.20	JF	-
G	ISSUE FOR SSDA REMEDIATION ACTION PLAN	01.02.21	HM	-
F	PRELIMINARY ISSUE	11.12.20	JF	-

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

CBRE

NSW GOVERNMENT Health Infrastructure

BONACCI

Bonacci Group (NSW) Pty Ltd
ABN 29 102 716 352
Consulting Engineers, Structural - Civil - Infrastructure
Level 6, 37 York Street, Sydney, NSW 2000 Australia
Tel: +61 2 8247 8400 Fax: +61 2 8247 8444
sydney@bonaccigroup.com
www.bonaccigroup.com

Project Name: GRIFFITH BASE HOSPITAL REDEVELOPMENT
NOOREBAR AVE, GRIFFITH NSW 2680

Drawing Title: BULK EARTHWORKS PLAN SHEET 1

PRELIMINARY

Designed	GK	Approved	Date
Drawn	JF		
Scale	1:500		
Date	JAN 2020		
Sheet	A1	Project Ref	Drawing No Rev
			130565-BON-CV-DWG-B36-0011 G

File: G:\Job\10616\03_Civil\130565-BON-CV-DWG-B36-0011.dwg Plotted: 01.02.21 at 1:50 PM By: Hilda Mendez

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THE FILL/SAND SUBGRADE SHOULD BE COMPACTED WITH A HEAVYWEIGHT VIBRATING ROLLER. A MINIMUM DRY DENSITY RATIO OF 98% OF THE MAXIMUM DRY DENSITY SHOULD BE ACHIEVED AT THE SURFACE.
WEAK OR UNSTABLE AREAS THAT DO NOT MEET THE COMPACTION STANDARD MUST BE EXCAVATED TO A MINIMUM DEPTH OF 500mm AND REPLACED WITH SELECTED FILL.
SELECTED FILL SHOULD BE PLACED IN UNIFORM LAYERS NOT EXCEEDING 200mm LOOSE AND THEN COMPACTED TO A DRY DENSITY RATIO OF 98% WITHIN THE RANGE OF 85% TO 115% OF THE OPTIMUM MOISTURE CONTENT

c. VOLUMES ARE APPROXIMATE ONLY AND DO NOT INCORPORATE BULKING FACTORS AND OVER EXCAVATION. VOLUMES HAVE BEEN CALCULATED BETWEEN STRIPPED SURFACE LEVELS AND BULK EARTHWORKS LEVELS.

d. GROUND WATER SEEPAGE MAY OCCUR IN EXCAVATED AREAS. DE-WATERING MAY BE REQUIRED IN THIS INSTANCE.

e. THIS DRAWING ONLY DETAILS EXCAVATION ASSOCIATED WITH THE BUILDING SLAB AND LIFT CORE FOOTINGS (IGNORING STRUCTURAL FOOTINGS UNO, BEAMS AND COLUMNS). IN ADDITION TO MAKING NO ALLOWANCE FOR TRENCH BACKFILL, TREE ROOTBALLS OR DETAILED EXCAVATION.

f. THE EXCAVATED MATERIAL IS TO BE TEMPORARILY STOCKPILED WITHIN THE LANDSCAPED AREAS (TO BE CONFIRMED ON-SITE) AND RE-USED AS LANDSCAPING SOIL BUILD-UP IN ACCORDANCE WITH LANDSCAPE ARCHITECTS SPECIFICATIONS.

g. REFER TO ARBORIST REPORT FOR TREE PROTECTION MEASURES IF REQUIRED.

h. 500mm ZONE OFFSET FROM BUILDING HAS BEEN ALLOWED FOR FORM WORK AND SCAFFOLDING WHERE SPECIFIED UNO.

i. PROVIDE TEMPORARY MAXIMUM 1 IN 1 BATTERS U.N.O. GEOTECH TO CONFIRM BATTER ACCEPTABILITY DURING CONSTRUCTION.

3. SITE CLEARANCE

a. DEMOLITION CLEAN UP
PRIOR TO COMPLETION, THE CONTRACTOR SHALL ENSURE THE SITE OF WORKS IS TIDIED AND OBTAIN A CLEARANCE FROM THE SUPERVISING ENGINEER OR PROJECT MANAGER.

4. TESTING

a. DATA
THE CONTRACTOR SHALL SUPPLY WRITTEN TEST RESULTS FROM A NATA REGISTERED GEOTECHNICAL ENGINEER CONFIRMING COMPLIANCE WITH THE SATISFACTIONS FOR ALL EARTHWORKS.

b. AUDIT
TEST RESULTS WILL BE REVIEWED BY THE SUPERINTENDENT AND WHERE SO REQUIRED ADDITIONAL TESTS WILL BE PROVIDED BY THE CONTRACTOR TO THE SUPERINTENDENT'S SATISFACTION.

5. SERVICES

a. EXISTING
ALL STATUTORY AUTHORITY SERVICES MUST BE MAINTAINED AND PROTECTED BY THE CONTRACTOR AT ALL TIMES UNLESS OTHERWISE SHOWN. EXISTING SERVICE LOCATIONS SHOWN HAVE BEEN OBTAINED FROM STATUTORY AUTHORITY RECORDS AND/OR SITE PLANS WHERE AVAILABLE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN AND ALL SERVICES SHOULD BE PROVEN ON SITE PRIOR TO THE COMMENCEMENT OF WORKS IN THEIR VICINITY.

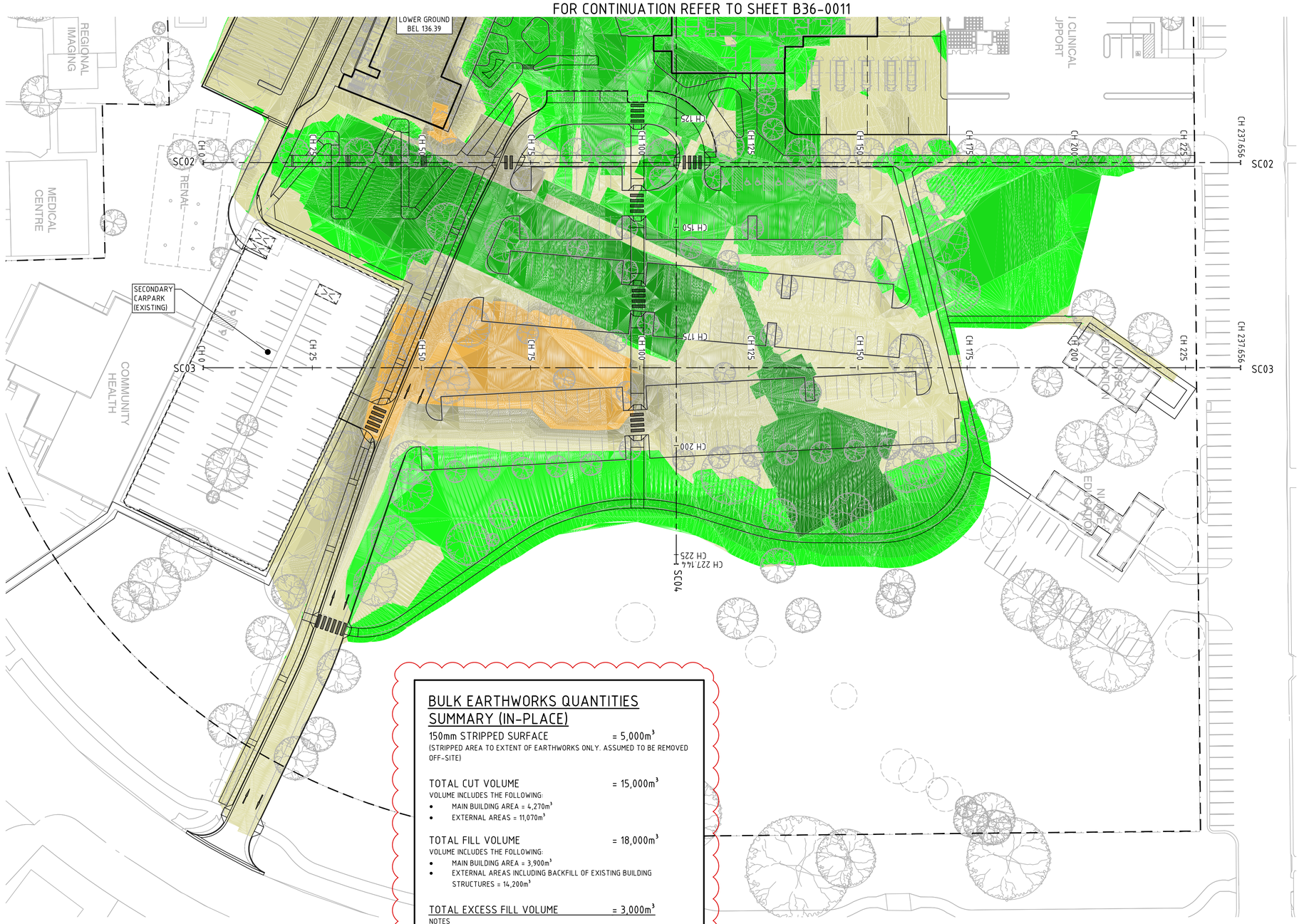
6. DRAINAGE

a. GENERAL
THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING TEMPORARY DRAINAGE.

b. EXISTING
EXISTING DRAINS ARE TO BE RETAINED WHERE POSSIBLE TO ENSURE THE SITE IS ABLE TO BE DRAINED. THEY SHOULD ONLY BE REMOVED WHEN THEY ARE NO LONGER REQUIRED.

c. TEMPORARY
THE CONTRACTOR SHALL ENSURE THAT THE SITE REMAINS FREE DRAINING DURING THE COURSE OF THE WORKS.

FOR CONTINUATION REFER TO SHEET B36-0011



BULK EARTHWORKS QUANTITIES SUMMARY (IN-PLACE)

150mm STRIPPED SURFACE = 5,000m³
(STRIPPED AREA TO EXTENT OF EARTHWORKS ONLY. ASSUMED TO BE REMOVED OFF-SITE)

TOTAL CUT VOLUME = 15,000m³
VOLUME INCLUDES THE FOLLOWING:
- MAIN BUILDING AREA = 4,270m³
- EXTERNAL AREAS = 11,070m³

TOTAL FILL VOLUME = 18,000m³
VOLUME INCLUDES THE FOLLOWING:
- MAIN BUILDING AREA = 3,900m³
- EXTERNAL AREAS INCLUDING BACKFILL OF EXISTING BUILDING STRUCTURES = 14,200m³

TOTAL EXCESS FILL VOLUME = 3,000m³

NOTES
1. EXCESS VOLUME BASED ON 100% REUSABLE EXCAVATED MATERIAL
2. VOLUMES DO NOT INCLUDE DETAILED EXCAVATION OF BIO-RETENTION BASIN/SWALES. ALLOW APPROXIMATELY 2,000m³.
3. VOLUMES DO NOT INCLUDE DETAILED EXCAVATION OF SERVICE TRENCHING. ALLOW APPROXIMATELY 1000m³

G

BULK EARTHWORKS DEPTH RANGE

CUT LOWER		CUT UPPER	CUT COLOUR	FILL LOWER		FILL UPPER	FILL COLOUR
-4.0	to	-3.5		0	to	0.5	
-3.5	to	-3.0		0.5	to	1.0	
-3.0	to	-2.5		1.0	to	1.5	
-2.5	to	-2.0		1.5	to	2.0	
-2.0	to	-1.5		2.0	to	2.5	
-1.5	to	-1.0		2.5	to	3.0	
-1.0	to	-0.5		3.0	to	3.5	
-0.5	to	0					

NOT FOR CONSTRUCTION

DIAL 1100 BEFORE YOU DIG

ALL EXISTING PROPERTY SERVICES' LOCATIONS AND DEPTHS ARE APPROXIMATE AND MUST BE VERIFIED ON SITE.
THE CONTRACTOR SHOULD SUPPLY PRECISE LOCATIONS AND DEPTHS TO THE ENGINEER FOR REVIEW PRIOR TO ANY WORKS THAT MAY AFFECT THESE SERVICES.

WARNING
NO DRAINAGE WORKS SHALL COMMENCE UNTIL THE CONTRACTOR CONFIRMS THE I.L. OF ALL EXISTING DRAINS, AND CONFIRMS IN WRITING WITH THE ENGINEERING SUPERVISOR.

WARNING
BEWARE OF UNDERGROUND SERVICES
THE LOCATIONS OF UNDERGROUND SERVICES SHOWN ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE.

THE CONTRACTOR SHALL BE TOTALLY RESPONSIBLE FOR AND AT ALL TIMES PROVIDE A SAFE WORKING ENVIRONMENT IN THE VICINITY OF THE SITE OF WORKS IN FULL COMPLIANCE WITH THE OCCUPATIONAL HEALTH AND SAFETY REGULATIONS.

HEALTH AND SAFETY

H1. THE OBLIGATION OF BONACCI GROUP PTY LTD (OR OTHER RELEVANT BONACCI ENTITY) (BONACCI) AS THE DESIGN ENGINEER IS LIMITED TO ENSURING THAT THOSE PARTS OF THE BUILDING OR STRUCTURE THAT ARE TO BE USED AS A WORKPLACE ARE, AS FAR AS REASONABLY PRACTICABLE, DESIGNED TO BE SAFE AND WITHOUT RISKS TO THE HEALTH OF THOSE PERSONS USING THE BUILDING OR STRUCTURE AS A WORKPLACE FOR THE PURPOSE FOR WHICH IT WAS DESIGNED IN ACCORDANCE WITH SECT. 28 OF THE OCCUPATIONAL HEALTH AND SAFETY ACT 2004 (VIC).

H2. BONACCI IS NOT RESPONSIBLE FOR THE OCCUPATIONAL HEALTH AND SAFETY OF PERSONS AT THE SITE AS THOSE OBLIGATIONS RESIDE WITH THE CONTRACTORS AND/OR SUB-CONTRACTORS WHO OCCUPY OR HAVE CONTROL OF THE SITE IN ACCORDANCE WITH APPLICABLE OCCUPATIONAL HEALTH AND SAFETY LEGISLATION, CODES OR PRACTICE, GUIDANCE NOTES, AUSTRALIAN STANDARDS AND OTHER RELEVANT DOCUMENTATION.

H3. ANY ADVICE OR GUIDANCE CONCERNING OCCUPATIONAL HEALTH AND SAFETY ISSUES ARISING AT THE SITE SHOULD BE DIRECTED TO THE HEALTH AND SAFETY EXECUTIVE OR OFFICER NOMINATED FOR THE PROJECT.

Rev	Description	Date	By	App
E	80% DESIGN DEVELOPMENT ISSUE	31.07.20	HM	-
D	70% DESIGN DEVELOPMENT ISSUE	19.06.20	HM	-
C	50% DESIGN DEVELOPMENT ISSUE	14.05.20	HM	-
B	100% SCHEMATIC DESIGN ISSUE	10.02.20	JF	-
A	100% SCHEMATIC DESIGN ISSUE	31.01.20	JF	-
G	ISSUE FOR SSDA REMEDIATION ACTION PLAN	01.02.21	HM	-
F	PRELIMINARY ISSUE	11.12.20	JF	-

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

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Project Name: GRIFFITH BASE HOSPITAL REDEVELOPMENT NOOREBAR AVE, GRIFFITH NSW 2680
Drawing Title: BULK EARTHWORKS PLAN SHEET 2

PRELIMINARY

Designed	GK	Approved	Date
Drawn	JF		
Scale	1:500		
Date	JAN 2020		
Sheet	A1	Project Ref	Drawing No / Rev
			130565-BON-CV-DWG-B36-0012 G

File: G:\Job\10616\03_Civil\130565-BON-CV-DWG-B36-0012.dwg Plotted: 01.02.21 at 12:47 PM By: Hilda Mendez

Appendix C: Previous Assessment Information

Site Plans & Laboratory Summary Tables

EIS PESA Report 2017

AERIAL IMAGE ©: 2015 GOOGLE INC.

SITE LOCATION PLAN

ENVIRONMENTAL INVESTIGATION SERVICES

EIS

SAMPLE LOCATION PLAN

ENVIRONMENTAL INVESTIGATION SERVICES

TABLE A
SOIL LABORATORY RESULTS COMPARED TO HILs
All data in mg/kg unless stated otherwise

			HEAVY METALS								PAHs		ORGANOCHLORINE PESTICIDES (OCPs)							OP PESTICIDES (OPPs)	TOTAL PCBs	ASBESTOS FIBRES
			Arsenic	Cadmium	Chromium VI [2]	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	B(a)P TEQ [3]	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) [1]			100	20	100	6000	300	40	400	7400	300	3	10	270	300	6	50	240	6	160	1	Detected/Not Detected
Sample Reference	**Sample Depth**	**Sample Description**																				
BH1	0-0.1	Topsoil: silty clay	LPQL	LPQL	23	8	8	LPQL	8	16	0.53	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH2	0-0.3	Topsoil: silty clay	LPQL	LPQL	23	9	20	LPQL	8	26	0.4	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH3	0-0.45	Sandy silty clay	4	LPQL	23	8	9	LPQL	7	30	0.54	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH4	0-0.5	Silty clay	LPQL	LPQL	21	16	10	0.2	6	32	0.2	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH5	0-0.2	Fill: clayey gravel	LPQL	LPQL	43	30	9	LPQL	73	38	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH5	1.3-1.5	Silty clay	LPQL	LPQL	17	6	6	LPQL	7	9	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH6	0-0.2	Fill: gravelly clay	LPQL	LPQL	28	9	11	LPQL	9	26	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH6	0.5-0.95	Silty clay	LPQL	LPQL	21	5	6	LPQL	6	10	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH7	0.5-0.6	Silty clay	LPQL	LPQL	21	7	7	LPQL	9	10	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH8	0.1-0.3	Silty clay	LPQL	LPQL	20	10	27	LPQL	9	42	0.6	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH9	0-0.2	Topsoil: silty clay	LPQL	LPQL	16	6	10	LPQL	6	20	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH10	0-0.2	Sandy silt	LPQL	LPQL	19	5	12	LPQL	6	15	1.7	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH11	0-0.2	Sandy silt	LPQL	LPQL	19	7	19	LPQL	7	47	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH12	0-0.2	Sandy silt	LPQL	LPQL	20	7	12	LPQL	7	22	0.3	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH13	0-0.2	Sandy clayey silt	LPQL	LPQL	21	10	17	LPQL	9	44	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH14	0-0.2	Fill: silty clay	LPQL	LPQL	23	13	14	LPQL	14	50	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
Total Number of Samples			16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	14
Maximum Value			4	LPQL	43	30	27	0.2	73	50	1.7	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NC

Explanation:

1 - Site Assessment Criteria (SAC): NEPM 2013, HIL-A: 'Residential with garden/accessible soils; children's day care centers; preschools; and primary schools'

2 - The 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.

3 - B(a)P TEQ - Benzo(a)pyrene Toxicity Equivalence Quotient has been calculated based on 8 carcinogenic PAHs and their Toxic Equivalence Factors (TEFs) outlined in NEPM 2013

Concentration above the SAC **VALUE**

Abbreviations:

PAHs: Polycyclic Aromatic Hydrocarbons
B(a)P: Benzo(a)pyrene
PQL: Practical Quantitation Limit
LPQL: Less than PQL
OPP: Organophosphorus Pesticides
OCP: Organochlorine Pesticides
PCBs: Polychlorinated Biphenyls
UCL: Upper Level Confidence Limit on Mean Value
HILs: Health Investigation Levels
NA: Not Analysed
NC: Not Calculated
NSL: No Set Limit
SAC: Site Assessment Criteria
NEPM: National Environmental Protection Measure

TABLE B
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	PID [2]
PQL - Envirolab Services					25	50	0.2	0.5	1	3	1	
HSL Land Use Category [1]					**RESIDENTIAL WITH ACCESSIBLE SOIL**							
Sample Reference	**Sample Depth**	**Sample Description**	**Depth Category**	**Soil Category**								
BH1	0-0.1	Topsoil: silty clay	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH2	0-0.3	Topsoil: silty clay	0m to < 1m	Clay	LPQL	85	LPQL	LPQL	LPQL	LPQL	LPQL	26
BH3	0-0.45	Sandy silty clay	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH4	0-0.5	Silty clay	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH5	0-0.2	Fill: clayey gravel	0m to < 1m	Sand	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH5	1.3-1.5	Silty clay	1m to <2m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH6	0-0.2	Fill: gravelly clay	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH6	0.5-0.95	Silty clay	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH7	0.5-0.6	Silty clay	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH8	0.1-0.3	Silty clay	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH9	0-0.2	Topsoil: silty clay	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH10	0-0.2	Sandy silt	0m to < 1m	Silt	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH11	0-0.2	Sandy silt	0m to < 1m	Silt	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH12	0-0.2	Sandy silt	0m to < 1m	Silt	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH13	0-0.2	Sandy clayey silt	0m to < 1m	Silt	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH14	0-0.2	Fill: silty clay	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
Total Number of Samples					16	16	16	16	16	16	16	16
Maximum Value					LPQL	85	LPQL	LPQL	LPQL	LPQL	LPQL	26

Explanation:
1 - Site Assessment Criteria (SAC): NEPM 2013
2 - Field PID values obtained during the investigation

Concentration above the SAC **VALUE**
The guideline corresponding to the elevated value is highlighted in grey in the Site Assessment Criteria Table below

Abbreviations:
UCL: Upper Level Confidence Limit on Mean Value
HSLs: Health Screening Levels
NA: Not Analysed
NC: Not Calculated
NL: Not Limiting
SAC: Site Assessment Criteria
PQL: Practical Quantitation Limit
LPQL: Less than PQL
NEPM: National Environmental Protection Measure

SITE ASSESSMENT CRITERIA

					C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene
PQL - Envirolab Services					25	50	0.2	0.5	1	3	1
HSL Land Use Category [1]					**RESIDENTIAL WITH ACCESSIBLE SOIL**						
Sample Reference	**Sample Depth**	**Sample Description**	**Depth Category**	**Soil Category**							
BH1	0-0.1	Topsoil: silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH2	0-0.3	Topsoil: silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH3	0-0.45	Sandy silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH4	0-0.5	Silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH5	0-0.2	Fill: clayey gravel	0m to < 1m	Sand	45	110	0.5	160	55	40	3
BH5	1.3-1.5	Silty clay	1m to <2m	Clay	90	NL	1	NL	NL	310	NL
BH6	0-0.2	Fill: gravelly clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH6	0.5-0.95	Silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH7	0.5-0.6	Silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH8	0.1-0.3	Sandy silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH9	0-0.2	Topsoil: silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH10	0-0.2	Sandy silt	0m to < 1m	Silt	40	230	0.6	390	NL	95	4
BH11	0-0.2	Sandy silt	0m to < 1m	Silt	40	230	0.6	390	NL	95	4
BH12	0-0.2	Sandy silt	0m to < 1m	Silt	40	230	0.6	390	NL	95	4
BH13	0-0.2	Sandy clayey silt	0m to < 1m	Silt	40	230	0.6	390	NL	95	4
BH14	0-0.2	Fill: silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5

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

Land Use Category [1]				URBAN RESIDENTIAL AND PUBLIC OPEN SPACE																		
							AGED HEAVY METALS-EILs						EILs		ESLs							
				pH	CEC ($cmol_c/kg$)	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	0.1	0.1	25	50	100	100	0.2	0.5	1	3	0.05
Ambient Background Concentration (ABC) [2]				-	-	-	NSL	13	28	163	5	122	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL
Sample Reference	**Sample Depth**	**Sample Description**	**Soil Texture**																			
BH1	0-0.1	Topsoil: silty clay	Fine	NA	NA	NA	LPQL	23	8	8	8	16	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0.09
BH2	0-0.3	Topsoil: silty clay	Fine	NA	NA	NA	LPQL	23	9	20	8	26	LPQL	LPQL	LPQL	85	140	LPQL	LPQL	LPQL	LPQL	LPQL	0.07
BH3	0-0.45	Sandy silty clay	Fine	NA	NA	NA	4	23	8	9	7	30	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0.08
BH4	0-0.5	Silty clay	Fine	NA	NA	NA	LPQL	21	16	10	6	32	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH5	0-0.2	Fill: clayey gravel	Coarse	7.6	33	11	LPQL	43	30	9	73	38	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH5	1.3-1.5	Silty clay	Fine	NA	NA	NA	LPQL	17	6	6	7	9	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH6	0-0.2	Fill: gravelly clay	Fine	NA	NA	NA	LPQL	28	9	11	9	26	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH6	0.5-0.95	Silty clay	Fine	NA	NA	NA	LPQL	21	5	6	6	10	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH7	0.5-0.6	Silty clay	Fine	NA	NA	NA	LPQL	21	7	7	9	10	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH8	0.1-0.3	Silty clay	Fine	NA	NA	NA	LPQL	20	10	27	9	42	LPQL	LPQL	LPQL	LPQL	130	LPQL	LPQL	LPQL	LPQL	LPQL	0.1
BH9	0-0.2	Topsoil: silty clay	Fine	NA	NA	NA	LPQL	16	6	10	6	20	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH10	0-0.2	Sandy silt	Fine	NA	NA	NA	LPQL	19	5	12	6	15	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0.2
BH11	0-0.2	Sandy silt	Fine	NA	NA	NA	LPQL	19	7	19	7	47	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH12	0-0.2	Sandy silt	Fine	NA	NA	NA	LPQL	20	7	12	7	22	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0.05
BH13	0-0.2	Sandy clayey silt	Fine	NA	NA	NA	LPQL	21	10	17	9	44	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH14	0-0.2	Fill: silty clay	Fine	NA	NA	NA	LPQL	23	13	14	14	50	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
Total Number of Samples				1	1	1	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
Maximum Value				7.6	33	11	4	43	30	27	73	50	LPQL	LPQL	LPQL	85	140	LPQL	LPQL	LPQL	LPQL	LPQL	0.2

Explanation:

1 - Site Assessment Criteria (SAC): NEPM 2013

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

Concentration above the SAC VALUE

The guideline corresponding to the elevated value is highlighted in grey in the EIL and ESL Assessment Criteria Table below

Abbreviations:

EILs: Ecological Investigation Levels
B(a)P: Benzo(a)pyrene
PQL: Practical Quantitation Limit
UCL: Upper Level Confidence Limit on Mean Value
ESLs: Ecological Screening Levels
NA: Not Analysed
LPQL: Less than PQL
SAC: Site Assessment Criteria
NEPM: National Environmental Protection Measure
NC: Not Calculated
NSL: No Set Limit
ABC: Ambient Background Concentration

EIL AND ESL ASSESSMENT CRITERIA

Land Use Category [1]				URBAN RESIDENTIAL AND PUBLIC OPEN SPACE																		
							AGED HEAVY METALS-EILs						EILs		ESLs							
				pH	CEC ($cmol_c/kg$)	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	0.1	0.1	25	50	100	100	0.2	0.5	1	3	0.05
Ambient Background Concentration (ABC) [2]				-	-	-	NSL	13	28	163	5	122	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL
Sample Reference	**Sample Depth**	**Sample Description**	**Soil Texture**																			
BH1	0-0.1	Topsoil: silty clay	Fine	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	1300	5600	60	105	125	45	33
BH2	0-0.3	Topsoil: silty clay	Fine	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	1300	5600	60	105	125	45	33
BH3	0-0.45	Sandy silty clay	Fine	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	1300	5600	60	105	125	45	33
BH4	0-0.5	Silty clay	Fine	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	1300	5600	60	105	125	45	33
BH5	0-0.2	Fill: clayey gravel	Coarse	7.6	33	11	100	413	248	1263	425	1322	170	180	180	120	300	2800	50	85	70	105	33
BH5	1.3-1.5	Silty clay	Fine	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	1300	5600	60	105	125	45	33
BH6	0-0.2	Fill: gravelly clay	Fine	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	1300	5600	60	105	125	45	33
BH6	0.5-0.95	Silty clay	Fine	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	1300	5600	60	105	125	45	33
BH7	0.5-0.6	Silty clay	Fine	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	1300	5600	60	105	125	45	33
BH8	0.1-0.3	Sandy silty clay	Fine	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	1300	5600	60	105	125	45	33
BH9	0-0.2	Topsoil: silty clay	Fine	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	1300	5600	60	105	125	45	33
BH10	0-0.2	Sandy silt	Fine	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	1300	5600	60	105	125	45	33
BH11	0-0.2	Sandy silt	Fine	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	1300	5600	60	105	125	45	33
BH12	0-0.2	Sandy silt	Fine	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	1300	5600	60	105	125	45	33
BH13	0-0.2	Sandy clayey silt	Fine	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	1300	5600	60	105	125	45	33
BH14	0-0.2	Fill: silty clay	Fine	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	1300	5600	60	105	125	45	33

EIS

TABLE D
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 [2]	Total Scheduled[3]		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	250	0.2	0.5	1	3	100
General Solid Waste CT1 [1]			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 [1]			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 [1]			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 [1]			2000	400	7600	NSL	6000	200	4200	NSL	800	23	432	30	1000	<50	<50	2600		NSL		40,000	72	2,073	4,320	7,200	-
Sample Reference	**Sample Depth**	**Sample Description**																									
BH1	0-0.1	Topsoil: silty clay	LPQL	LPQL	23	8	8	LPQL	8	16	0.53	0.09	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH2	0-0.3	Topsoil: silty clay	LPQL	LPQL	23	9	20	LPQL	8	26	0.4	0.07	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	84	LPQL	110	194	LPQL	LPQL	LPQL	LPQL	LPQL
BH3	0-0.45	Sandy silty clay	4	LPQL	23	8	9	LPQL	7	30	0.54	0.08	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH4	0-0.5	Silty clay	LPQL	LPQL	21	16	10	0.2	6	32	0.2	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH5	0-0.2	Fill: clayey gravel	LPQL	LPQL	43	30	9	LPQL	**73**	38	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH5	1.3-1.5	Silty clay	LPQL	LPQL	17	6	6	LPQL	7	9	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH6	0-0.2	Fill: gravelly clay	LPQL	LPQL	28	9	11	LPQL	9	26	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH6	0.5-0.95	Silty clay	LPQL	LPQL	21	5	6	LPQL	6	10	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH7	0.5-0.6	Silty clay	LPQL	LPQL	21	7	7	LPQL	9	10	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH8	0.1-0.3	Silty clay	LPQL	LPQL	20	10	27	LPQL	9	42	0.6	0.1	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	110	110	LPQL	LPQL	LPQL	LPQL	LPQL
BH9	0-0.2	Topsoil: silty clay	LPQL	LPQL	16	6	10	LPQL	6	20	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH10	0-0.2	Sandy silt	LPQL	LPQL	19	5	12	LPQL	6	15	1.7	0.2	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH11	0-0.2	Sandy silt	LPQL	LPQL	19	7	19	LPQL	7	47	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH12	0-0.2	Sandy silt	LPQL	LPQL	20	7	12	LPQL	7	22	0.3	0.05	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH13	0-0.2	Sandy clayey silt	LPQL	LPQL	21	10	17	LPQL	9	44	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH14	0-0.2	Fill: silty clay	LPQL	LPQL	23	13	14	LPQL	14	50	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
Total Number of samples			16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	14
Maximum Value			4	LPQL	43	30	27	0.2	73	50	1.7	0.2	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	84	LPQL	110	194	LPQL	LPQL	LPQL	LPQL	NC

Explanation:

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

[2] - Assessment of Total Moderately Harmful pesticides includes: Dichlorovos, Dimethoate, Fenitrothion, Ethion, Malathion and Parathion

[3] - 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

Concentration above the CT1 **VALUE**
Concentration above SCC1 **VALUE**
Concentration above the SCC2 **VALUE**

Abbreviations:

PAHs: Polycyclic Aromatic Hydrocarbons
B(a)P: Benzo(a)pyrene
PQL: Practical Quantitation Limit
LPQL: Less than PQL
PID: Photoionisation Detector
PCBs: Polychlorinated Biphenyls
UCL: Upper Level Confidence Limit on Mean Value
NA: Not Analysed
NC: Not Calculated
NSL: No Set Limit
SAC: Site Assessment Criteria
TRH: Total Recoverable Hydrocarbons
CT: Contaminant Threshold
SCC: Specific Contaminant Concentration
HILs: Health Investigation Levels
NEPM: National Environmental Protection Measure
BTEX: Monocyclic Aromatic Hydrocarbons

TABLE E

SOIL LABORATORY TCLP RESULTS

All data in mg/L unless stated otherwise

			Nickel
PQL - Envirolab Services			0.02
TCLP1 - General Solid Waste [1]			2
TCLP2 - Restricted Solid Waste [1]			8
TCLP3 - Hazardous Waste [1]			>8
Sample Reference	**Sample Depth**	**Sample Description**	
BH5	0-0.2	Fill: clayey gravel	LPQL
Total Number of samples			1
Maximum Value			LPQL

Explanation:

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

General Solid Waste	**VALUE**
Restricted Solid Waste	**VALUE**
Hazardous Waste	**VALUE**

Abbreviations:

PQL: Practical Quantitation Limit

LPQL: Less than PQL

B(a)P: Benzo(a)pyrene

NC: Not Calculated

NA: Not Analysed

TCLP: Toxicity Characteristics Leaching Procedure

TABLE F
SOIL INTRA-LABORATORY DUPLICATE RESULTS & RPD CALCULATIONS
All results in mg/kg unless stated otherwise

SAMPLE	ANALYSIS	Envirolab PQL	INITIAL	REPEAT	MEAN	RPD %
Sample Ref = BH10 (0-0.2m)	Arsenic	4	LPQL	LPQL	NC	NC
Dup Ref = Dup 1	Cadmium	0.4	LPQL	LPQL	NC	NC
	Chromium	1	19	20	19.5	5
Envirolab Report: 179648	Copper	1	5	5	5.0	0
	Lead	1	12	11	11.5	9
	Mercury	0.1	LPQL	LPQL	NC	NC
	Nickel	1	6	6	6.0	0
	Zinc	1	15	16	15.5	6
	Naphthalene	0.1	LPQL	LPQL	NC	NC
	Acenaphthylene	0.1	LPQL	LPQL	NC	NC
	Acenaphthene	0.1	LPQL	LPQL	NC	NC
	Fluorene	0.1	LPQL	LPQL	NC	NC
	Phenanthrene	0.1	0.1	0.2	0.2	67
	Anthracene	0.1	LPQL	LPQL	NC	NC
	Fluoranthene	0.1	0.3	0.5	0.4	50
	Pyrene	0.1	0.4	0.8	0.6	67
	Benzo(a)anthracene	0.1	0.1	0.3	0.2	100
	Chrysene	0.1	0.1	0.4	0.3	120
	Benzo(b,j+k)fluoranthene	0.2	0.3	0.5	0.4	50
	Benzo(a)pyrene	0.05	0.2	0.3	0.3	40
	Indeno(123-cd)pyrene	0.1	0.1	0.2	0.2	67
	Dibenzo(ah)anthracene	0.1	LPQL	LPQL	NC	NC
	Benzo(ghi)perylene	0.1	0.2	0.3	0.3	40
	Total OCPs	0.1	LPQL	LPQL	NC	NC
	Total OPPs	0.1	LPQL	LPQL	NC	NC
	Total PCBs	0.1	LPQL	LPQL	NC	NC
	TRH C_6-C_{10} (F1)	25	LPQL	LPQL	NC	NC
	TRH >C_{10}-C_{16} (F2)	50	LPQL	LPQL	NC	NC
	TRH >C_{16}-C_{34} (F3)	100	LPQL	LPQL	NC	NC
	TRH >C_{34}-C_{40} (F4)	100	LPQL	LPQL	NC	NC
	Benzene	0.5	LPQL	LPQL	NC	NC
	Toluene	0.5	LPQL	LPQL	NC	NC
	Ethylbenzene	1	LPQL	LPQL	NC	NC
	m+p-xylene	2	LPQL	LPQL	NC	NC
	o-xylene	1	LPQL	LPQL	NC	NC

Explanation:

The RPD value is calculated as the absolute value of the difference between the initial and repeat results divided by the average value expressed as a percentage. The following acceptance criteria will be used to assess the RPD results:

Results > 10 times PQL = RPD value <= 50% are acceptable
Results between 5 & 10 times PQL = RPD value <= 75% are acceptable
Results < 5 times PQL = RPD value <= 100% are acceptable

If result is LPQL then 50% of the PQL is used for the calculation

RPD Results Above the Acceptance Criteria VALUE

Abbreviations:

PQL: Practical Quantitation Limit
LPQL: Less than PQL
NA: Not Analysed
NC: Not Calculated
OCP: Organochlorine Pesticides
OPP: Organophosphorus Pesticides
PCBs: Polychlorinated Biphenyls
TRH: Total Recoverable Hydrocarbons

TABLE G

SUMMARY OF FIELD QA/QC RESULTS

ANALYSIS	Envirolab PQL		TB1[S]
			7/11/2017
	mg/kg	µg/L	mg/kg
Benzene	1	1	LPQL
Toluene	1	1	LPQL
Ethylbenzene	1	1	LPQL
m+p-xylene	2	2	LPQL
o-xylene	1	1	LPQL

Explanation:

[W] Sample type (water)

[S] Sample type (sand)

BTEX concentrations in trip spikes are presented as % recovery

Values above PQLs/Acceptance criteria **VALUE**

Abbreviations:

PQL: Practical Quantitation Limit

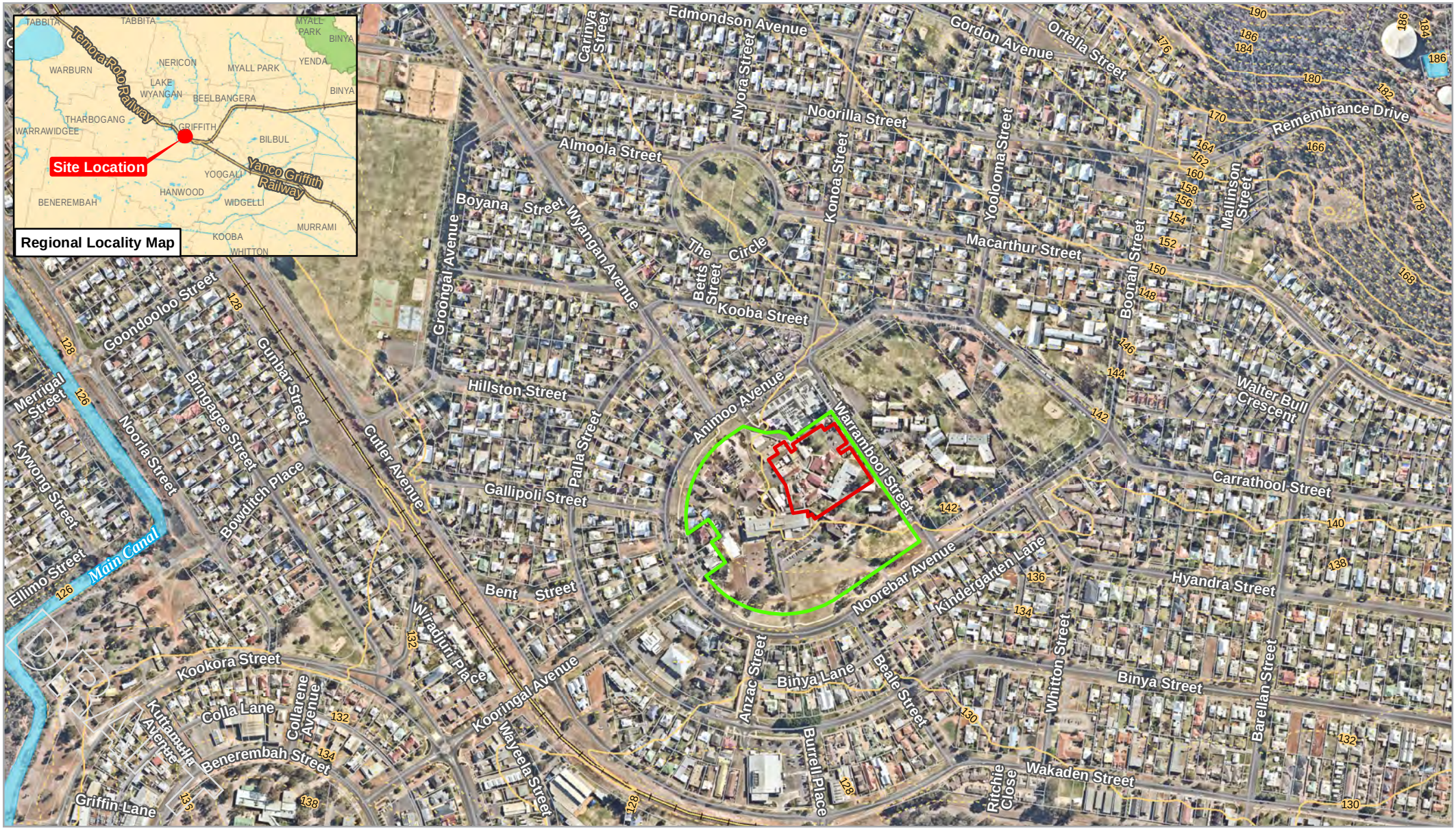
LPQL: Less than PQL

NA: Not Analysed

NC: Not Calculated

TB: Trip Blank

GHD Stage 1 Development Area Phase 2 ESA report 2018



Legend

- Stage 1 Development Area (Approximate)
- Stage 2 Development Area
- Waterbodies
- Cadastre
- Roads
- Railways
- Contours

Paper Size ISO A4

0 50 100 150 200

Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

GHD

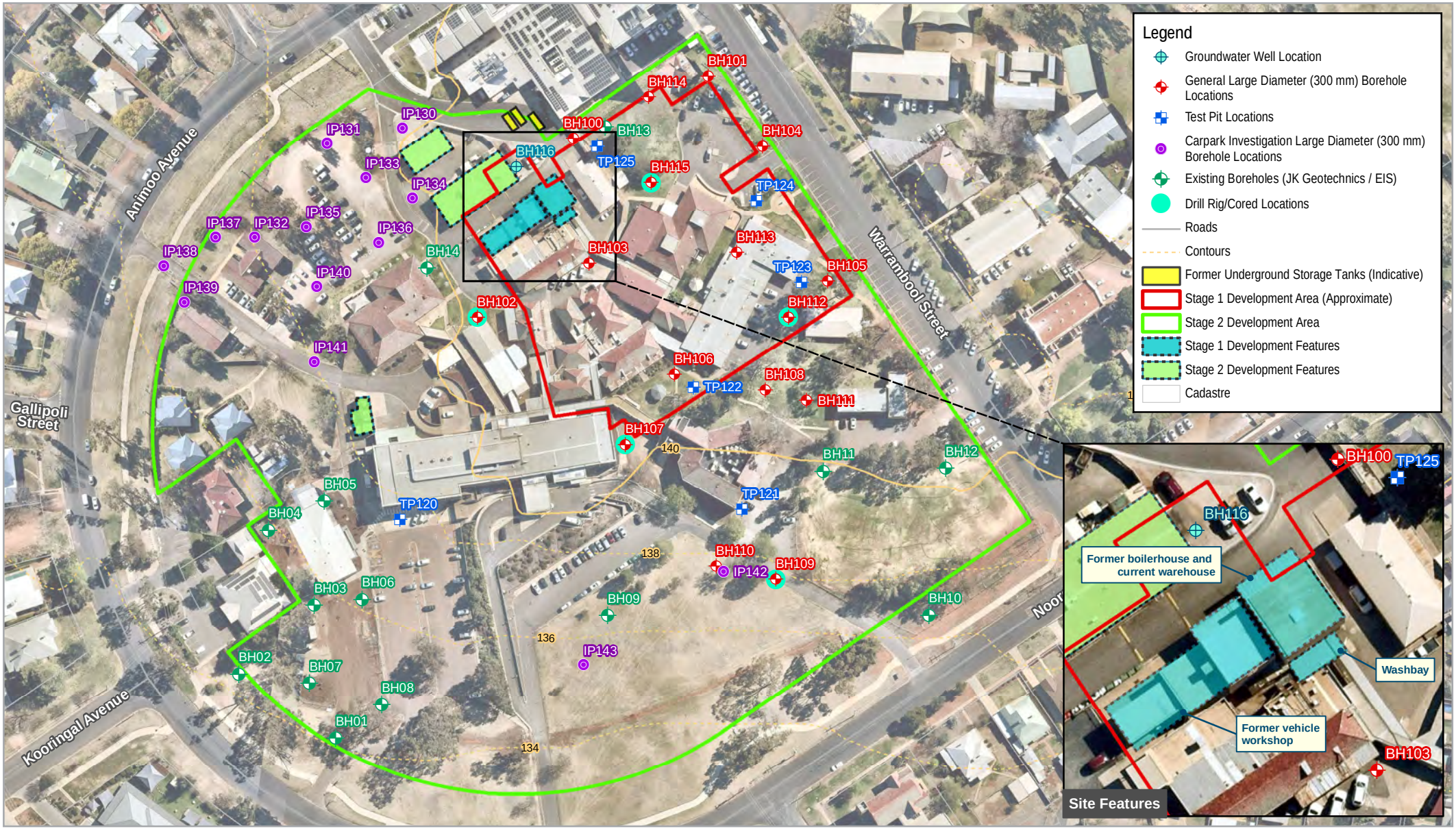
Health Infrastructure
Griffith Hospital Redevelopment
Geotechnical Investigation and Contamination Assessment

Stage 1 Development Area
Site Locality Plan

Project No. 21-27721
Revision No. A
Date 29 Nov 2018

FIGURE 1

Data source: General topo - NSW LPI DTDB 2012. Cadastre - NSW LPI DCDB 2012. Aerial imagery - Nearmap (Image date: 30 Sept 2018, Extraction date: 23 November 2018). Existing borehole locations - JK Geotechnics, 2017 (Borehole Location Plan Report No. 30991L, Fig. No. 2). Created by: kqvelasco



DRAFT

Paper Size ISO A4

0 20 40 60 80

Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

GHD

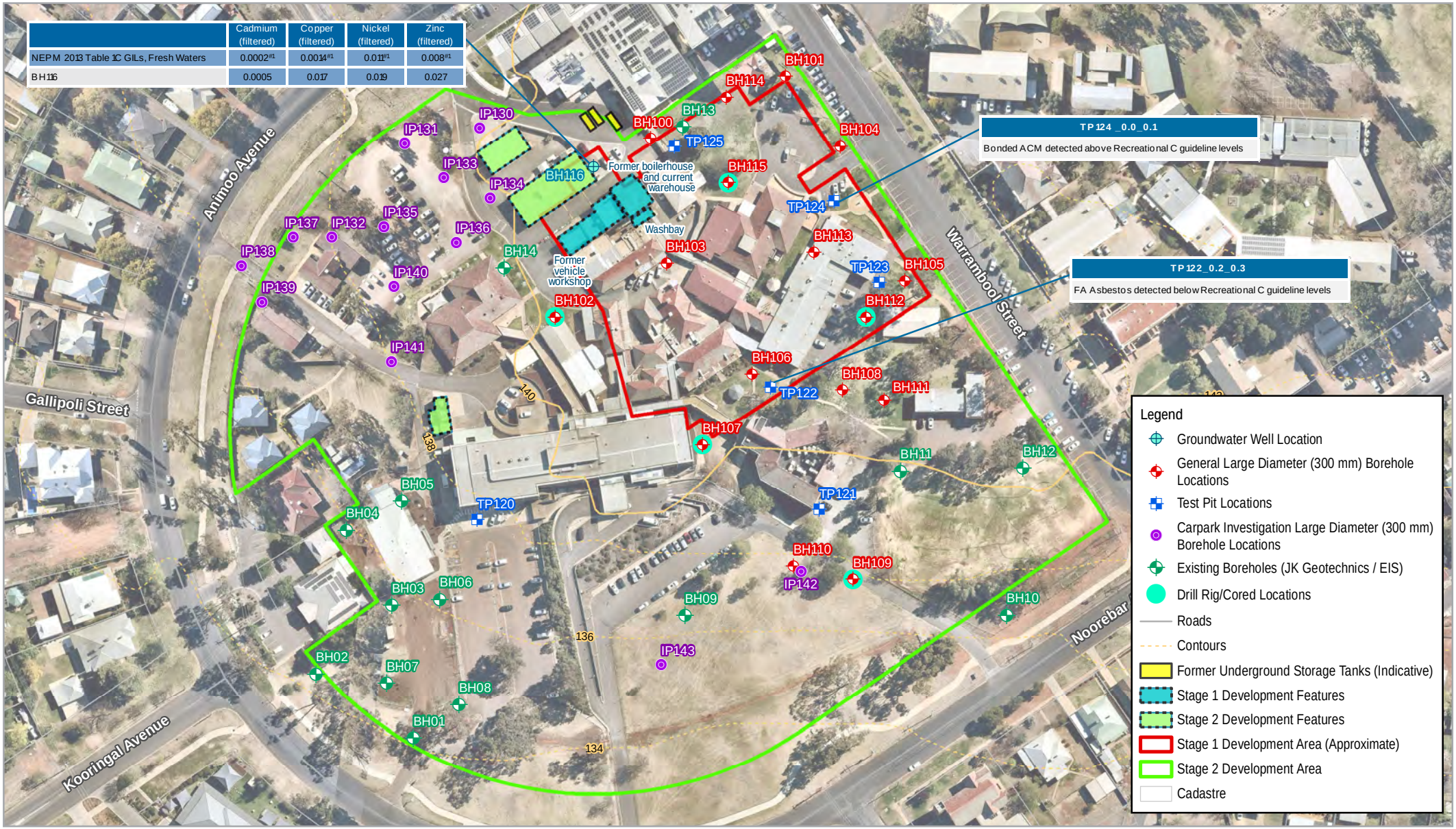
Health Infrastructure
Griffith Hospital Redevelopment
Geotechnical Investigation and Contamination Assessment

Project No. 21-27721
Revision No. A
Date 29 Nov 2018

Stage 1 Development Area Sampling Location Plan and Site Features

FIGURE 2

Data source: General topo - NSW LPI DTDB 2012. Cadastre - NSW LPI DCDB 2012. Aerial imagery - Nearmap (Image date: 30 Sept 2018, Extraction date: 23 November 2018). Existing borehole locations - JK Geotechnics, 2017 (Borehole Location Plan Report No. 30991L, Fig. No. 2). Created by: kqvelasco



DRAFT

Paper Size ISO A4

0 20 40 60 80

Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

GHD

Health Infrastructure
Griffith Hospital Redevelopment
Geotechnical Investigation and Contamination Assessment

Project No. 21-27721
Revision No. A
Date 29 Nov 2018

Stage 1 Development Area Guideline Exceedance Locations

FIGURE 3

Data source: General topo - NSW LPI DTDB 2012. Cadastre - NSW LPI DCDB 2012. Aerial imagery - Nearmap (Image date: 30 Sept 2018, Extraction date: 23 November 2018). Existing borehole locations - JK Geotechnics, 2017 (Borehole Location Plan Report No. 30991L, Fig. No. 2) . Created by: kqvelasco

Appendix D Table QA1
Quality Samples

Health Infrastructure NSW
Griffith Hospital Redevelopment
– Contamination Investigation

	Groundwater QA/QC Samples			Soil QA/QC Samples							
Lab Report Number	627174	627174	627174	626759	627011	626158	626161	626158	626161	627011	627011
Field ID	RB02_GW	TB02	TS02	BH103	RB01_SOIL	TB1	TB2	TS1	TS2	TB01	TS01
Sampled_Date/Time	8/11/2018	8/11/2018	8/11/2018	2/11/2018	8/11/2018		31/10/2018		31/10/2018	8/11/2018	8/11/2018
Sample Type	Rinsate	Trip_B	Trip_S	Rinsate	Rinsate	Trip_B	Trip_B	Trip_S	Trip_S	Trip_B	Trip_S
Matrix	Water	Water	Water	Water	Water	Water	Water	Water	Water	Soil	Soil
Method_Type	**ChemName**											
F1-BTEX	F1 (C6-C10 minus BTEX)		<20				<20	<20				
Heavy Metal	Arsenic	<0.001			<0.001	<0.001						
	Arsenic (Filtered)											
	Cadmium	<0.0002			<0.0002	<0.0002						
	Cadmium (Filtered)											
	Chromium (III+VI)	<0.001			<0.001	<0.001						
	Chromium (III+VI) (Filtered)											
	Copper	<0.001			<0.001	<0.001						
	Copper (Filtered)											
	Lead	<0.001			<0.001	<0.001						
	Lead (Filtered)											
	Mercury	<0.0001			<0.0001	<0.0001						
	Mercury (Filtered)											
	Nickel	<0.001			<0.001	<0.001						
	Nickel (Filtered)											
	Zinc	<0.005			<0.005	<0.005						
	Zinc (Filtered)											
Organic	Naphthalene (BTEXN)		<10	100*			<10	<10	78*	99*	<0.5	83*
	F1 (C6-C10 minus BTEX)										<20	
	C6-C10 Fraction		<20	77*			<20	<20	81*	72*	<20	110*
	F2 (>C10-C16 minus Naphthalene)											
	>C10-C16 Fraction											
	F3 (>C16-C34 Fraction)											
	F4 (>C34-C40 Fraction)											
	>C10-C40 (Sum of Total)											
	C6-C9 Fraction		<20	76*			<20	<20	76*	75*	<20	100*
Volatile	Benzene		<1	100*			<1	<1	110*	110*	<0.1	110*
	Toluene		<1	100*			<1	<1	94*	88*	<0.1	100*
	Ethylbenzene		<1	110*			<1	<1	94*	85*	<0.1	100*
	Xylene (o)		<1	110*			<1	<1	100*	97*	<0.1	100*
	Xylene (m & p)		<2	110*			<2	<2	98*	96*	<0.2	100*
	Xylene Total		<3	110*			<3	<3	97*	89*	<0.3	100*

* Results reported as percentage recovery.

Filter: Lab_Report_Number in('627011','627174','626734','626759','626158','626161')
\\ghdnet\ghd\AU\Sydney\Projects\21\27721\Contamination\Esdat_output\3. QA\QA2 - FieldBlankWater.xlsx

Appendix D
Table QA2
Duplicate RPD Comparison

Lab Report Number	626161	626161		626161	626161		626161	626161		627011	627011		627011	ES1833667		627011	ES1833667	
Field ID	BH108 0.7-1.0	QA3	RPD	IP133 0.4-0.6	QA2	RPD	IP136 0.4-0.6	QA1	RPD	TP124 0.0 0.1	QA01	RPD	TP124 0.0 0.1	QA02	RPD	TP122 0.0 0.1	QA04	RPD
Sampled Date/Time	1/11/2018	1/11/2018		31/10/2018	31/10/2018		31/10/2018	31/10/2018		8/11/2018	8/11/2018		8/11/2018	8/11/2018		8/11/2018	8/11/2018	

Method_Type	ChemName	Units	EQL																	
Inorganic	Moisture Content (dried @ 103°C)	%	1	8.2	7	16	3.1	2.9	7	11	12	9	13	13	0	13					
Heavy Metal	Arsenic	mg/kg	2 : 5 (Interlab)	3	2.7	11	2.6	2.7	4	3.3	3.8	14	2.5	2.7	8	2.5	<5	0	2.1	<5	0
	Cadmium	mg/kg	0.4 : 1 (Interlab)	<0.4	<0.4	0	<0.4	<0.4	0	<0.4	<0.4	0	<0.4	<0.4	0	<0.4	<1	0	<0.4	<1	0
	Chromium (III+VI)	mg/kg	5 : 2 (Interlab)	23	23	0	19	19	0	33	33	0	**27**	**37**	**31**	**27**	**19**	**35**	16	13	21
	Copper	mg/kg	5	8.7	7.8	11	7.6	7.5	1	11	12	9	11	15	31	11	9	20	7	6	15
	Lead	mg/kg	5	9.7	10	3	14	14	0	9.1	9.5	4	**14**	**75**	**137**	14	18	25	6.9	6	14
	Mercury	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0
	Nickel	mg/kg	5 : 2 (Interlab)	13	9.6	30	8.5	8	6	22	24	9	**26**	**47**	**58**	**26**	**19**	**31**	5.7	4	35
	Zinc	mg/kg	5	20	22	10	31	27	14	21	22	5	41	52	24	41	41	0	26	21	21
Organic	Naphthalene (BTEXN)	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5					
Volatile	Benzene	mg/kg	0.1 : 0.2 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.2	0	<0.1	<0.2	0
	Toluene	mg/kg	0.1 : 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.5	0
	Ethylbenzene	mg/kg	0.1 : 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.5	0
	Xylene (o)	mg/kg	0.1 : 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.5	0
	Xylene (m & p)	mg/kg	0.2 : 0.5 (Interlab)	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.5	0	<0.2	<0.5	0
	Xylene Total	mg/kg	0.3 : 0.5 (Interlab)	<0.3	<0.3	0	<0.3	<0.3	0	<0.3	<0.3	0	<0.3	<0.3	0	<0.3	<0.5	0	<0.3	<0.5	0
Organic	F1 (C6-C10 minus BTEX)	mg/kg	20 : 10 (Interlab)	<20	<20	0	<20	<20	0	<20	<20	0	<20	<20	0	<20	<10	0	<20	<10	0
	C6-C10 Fraction	mg/kg	20 : 10 (Interlab)	<20	<20	0	<20	<20	0	<20	<20	0	<20	<20	0	<20	<10	0	<20	<10	0
	F2 (>C10-C16 minus Naphthalene)	mg/kg	50	<50	<50	0	<50	<50	0	<50	<50	0	<50	<50	0	<50	<50	0	<50	<50	0
	>C10-C16 Fraction	mg/kg	50	<50	<50	0	<50	<50	0	<50	<50	0	<50	<50	0	<50	<50	0	<50	<50	0
	F3 (>C16-C34 Fraction)	mg/kg	100	<100	<100	0	<100	<100	0	<100	<100	0	120	110	9	120	<100	18	<100	<100	0
	F4 (>C34-C40 Fraction)	mg/kg	100	<100	<100	0	<100	<100	0	<100	<100	0	<100	<100	0	<100	<100	0	<100	<100	0
	>C10-C40 (Sum of Total)	mg/kg	100 : 50 (Interlab)	<100	<100	0	<100	<100	0	<100	<100	0	120	110	9	120	<50	82	<100	<50	0
	C6-C9 Fraction	mg/kg	20 : 10 (Interlab)	<20	<20	0	<20	<20	0	<20	<20	0	<20	<20	0	<20	<10	0	<20	<10	0
TPH	C10-C14 Fraction	mg/kg	20 : 50 (Interlab)	<20	<20	0	<20	<20	0	<20	<20	0	<20	<20	0	<20	<50	0	<20	<50	0
	C15-C28 Fraction	mg/kg	50 : 100 (Interlab)	<50	<50	0	<50	<50	0	<50	<50	0	77	72	7	77	<100	0	<50	<100	0
	C29-C36 Fraction	mg/kg	50 : 100 (Interlab)	<50	<50	0	<50	<50	0	<50	<50	0	66	57	15	66	<100	0	<50	<100	0
	C10-C36 (Sum of Total)	mg/kg	50	<50	<50	0	<50	<50	0	<50	<50	0	143	129	10	143	<50	96	<50	<50	0
PAH	Acenaphthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Acenaphthylene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Benz(a)anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Benzo(a) pyrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Benzo[b+j]fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Benzo(k)fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Benzo(g,h,i)perylene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Chrysene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Dibenz(a,h)anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Fluorene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Naphthalene-PAH	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5					
	Phenanthrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Pyrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	PAHs (Sum of total) - Lab calc	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Total 8 PAHs (as BaP TEQ)(zero LOR) - Lab Calc	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Total 8 PAHs (as BaP TEQ)(half LOR) - Lab Calc	mg/kg	0.5	0.6	0.6	0	0.6	0.6	0	0.6	0.6	0	0.6	0.6	0	0.6	0.6	0	0.6	0.6	0
	Total 8 PAHs (as BaP TEQ)(full LOR) - Lab Calc	mg/kg	0.5	1.2	1.2	0	1.2	1.2	0	1.2	1.2	0	1.2	1.2	0	1.2	1.2	0	1.2	1.2	0

*RPDs have only been considered where a concentration is greater than 10 times the EQL.
**GHD adopts a nominal acceptance criterion of < 50% RPD for field duplicates and splits for organics and an acceptance criterion of < 30% RPD for inorganics.
***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

								Inorganics				Particle Size Analysis	Exchangeable cations	TOC	Asbestos			
								Moisture (%)	Electrical conductivity (lab)	Moisture Content (dried @ 103°C)	pH (aqueous extract)	Clay (<2 µm)	CEC	Total Organic Carbon	Organic Fibres - Comment	Respirable Fibres - Comment	Asbestos from ACM in Soil	Asbestos from FA & AF in Soil
								%	µS/cm	%	pH Units	%	meq/100g	%	Comment	Comment	%w/w	%w/w
EQL								1	10	1	0.1	1	0.05	0.1				
NEPM 2013 Table 1A(1) HIL B Res																		
NEPM 2013 Table 1A(1) HIL C Rec																		
NEPM 2013 Table 1A(3) HSL A/B Res Soil for Vapour Intrusion, Sand																		
0-1m																		
NEPM 2013 Table 7 HSL C Rec Asbestos contamination in soil																	0.02	0.001[#11]
Location Code	**Depth**	**Date**	**Field ID**	**Sample Type**	**Matrix Type**	**Lab Report Number**												
BH101	0.05 - 0.2	2/11/2018	BH101 0.05-0.2M	Normal	soil	626759		-	-	3.3	-	-	-	-	Organic fibres detected.	No respirable fibres detected.	-	-
BH101	0.8 - 1	2/11/2018	BH101 0.8-1.0M	Normal	soil	626759		-	-	9.8	-	-	-	-	-	-	-	-
BH103	0.05 - 0.2	2/11/2018	BH103 0.05-0.2M	Normal	soil	626759		-	-	16	-	-	-	-	Organic fibres detected.	No respirable fibres detected.	-	-
BH104	0.05 - 0.2	2/11/2018	BH104 0.05-0.2M	Normal	soil	626759		-	-	6.2	-	-	-	-	Organic fibres detected.	No respirable fibres detected.	-	-
BH104	0.4 - 0.5	2/11/2018	BH104 0.4-0.5M	Normal	soil	626759		-	-	5.7	-	-	-	-	-	-	-	-
BH105	0.05 - 0.2	30/10/2018	BH105_0.05-0.2	Normal	soil	626158		-	-	6.2	-	-	-	-	Organic fibres detected.	No respirable fibres detected.	-	-
BH105	0.9 - 1.1	30/10/2018	BH105_0.9-1.1	Normal	soil	626158		-	260	15	8.3	11	29	0.4	-	-	-	-
BH106	0.1 - 0.2	30/10/2018	BH106_0.1-0.2	Normal	soil	626158		-	-	4.8	-	-	-	-	Organic fibres detected.	No respirable fibres detected.	-	-
BH112	0.05 - 0.2	31/10/2018	BH112_0.05-0.2	Normal	soil	626158		-	-	-	-	-	-	-	Organic fibres detected.	No respirable fibres detected.	-	-
BH112	0.8 - 1	31/10/2018	BH112_0.8-1.0	Normal	soil	626158		-	-	6.8	-	-	-	-	-	-	-	-
BH113	0.05 - 0.2	2/11/2018	BH113_0.05-0.2	Normal	soil	626158		-	-	7.0	-	-	-	-	Organic fibres detected.	No respirable fibres detected.	-	-
BH115	0.05 - 0.2	31/10/2018	BH115_0.05-0.2	Normal	soil	626158		-	-	19	-	-	-	-	Organic fibres detected.	No respirable fibres detected.	-	-
BH116	0.05 - 0.2	1/11/2018	BH116_0.05-0.2	Normal	soil	626158		-	-	6.0	-	-	-	-	-	-	-	-
BH116	0.3 - 0.5	1/11/2018	BH116_0.3-0.5	Normal	soil	626158		-	-	5.2	-	-	-	-	Organic fibres detected.	No respirable fibres detected.	0.0000	0.0000
BH116	0.6 - 0.8	1/11/2018	BH116_0.6-0.8	Normal	soil	626158		-	170	7.6	7.0	7.5	15	0.7	-	-	-	-
BH116	0.9 - 1.1	1/11/2018	BH116_0.9-1.1	Normal	soil	626158		-	-	11	-	-	-	-	-	-	-	-
TP122	0 - 0.1	8/11/2018	QA04	Interlab_D	soil	ES1833667		21.2	-	-	-	-	-	-	-	-	-	-
TP122	0 - 0.1	8/11/2018	TP122_0.0_0.1	Normal	soil	627011		-	-	17	-	-	-	-	-	-	-	-
TP122	0.2 - 0.3	8/11/2018	TP122_0.2_0.3	Normal	soil	627011		-	-	-	-	-	-	-	Organic fibres detected.	No respirable fibres detected.	0.0000	0.000032
TP122	0.6 - 0.7	8/11/2018	TP122_0.6_0.7	Normal	soil	627011		-	-	13	-	-	-	-	-	-	-	-
TP123	0 - 0.1	8/11/2018	TP123_0.0_0.1	Normal	soil	627011		-	-	13	-	-	-	-	Organic fibres detected.	No respirable fibres detected.	0.0000	0.0000
TP124	0 - 0.1	8/11/2018	QA01	Field_D	soil	627011		-	-	13	-	-	-	-	-	-	-	-
TP124	0 - 0.1	8/11/2018	QA02	Interlab_D	soil	ES1833667		12.4	-	-	-	-	-	-	-	-	-	-
TP124	0 - 0.1	8/11/2018	TP124_0.0_0.1	Normal	soil	627011		-	-	13	-	-	-	-	Organic fibres detected.	No respirable fibres detected.	0.0436	0.0000
TP124	0.6 - 0.7	8/11/2018	TP124_0.6_0.7	Normal	soil	627011		-	-	4.8	-	-	-	-	-	-	-	-
TP125	0.2 - 0.3	8/11/2018	TP125_0.2_0.3	Normal	soil	627011		-	-	6.4	-	-	-	-	Organic fibres detected.	No respirable fibres detected.	0.0000	0.0000

Comments

#1 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe important and should be considered where appropriate (refer Shedule B7).

#2 In the absence of a guideline value for total chromium, chromium VI value adopted

#3 Lead: HILs A,B,C based on blood lead models (IEUBK & HIL D on adult lead model for where 50% bioavailability considered. Site-specific bioavailability should be considered where appropriate.

#4 Elemental mercury: HIL does not address elemental mercury. a site specific assessment should be considered if elemental mercury is present, or suspected to be present.

#5 Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application should consider presence of carcinogenic PAHs (should meet BaP TEQ HIL) & napthalene (should meet relevant HSL)

#6 Carcinogenic PAHs: HIL based on 8 carc. PAHs & their TEFs (rel to BaP ref Schedule 7) BaP TEQ calc by multiplying the conc of each carc. PAH in sample by its BaP TEF (ref Table 1A(1)) & summing

#7 PCBs: HIL refers to non-dioxin like PCBs only. Where PCB source is known, or suspected at a site, a site-specific assessment of exposure to all PCBs (inc dioxin like PCBs) should be undertaken

#8 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.

#9 To obtain F2 subtract napthalene from the >C10 - C16 fraction.

#10 Not limiting: Derived soil HSL exceeds soil saturation concentration

#11 Only applies where the FA & AF are able to be quantified by gravimetric procedures. Not applicable to free fibres.

#12 Nil

								Metals									
							Asbestos Reported Result	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc	Benzene
							Comment	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL								2	0.4	2	5	5	0.1	2	5	0.1
NEPM 2013 Table 1A(1) HIL B Res								500[#1]	150	500[#2]	30,000	1,200[#3]	120[#4]	1,200	60,000	
NEPM 2013 Table 1A(1) HIL C Rec								300[#1]	90	300[#2]	17,000	600[#3]	80[#4]	1,200	30,000	
NEPM 2013 Table 1A(3) HSL A/B Res Soil for Vapour Intrusion, Sand																
0-1m																0.5
NEPM 2013 Table 7 HSL C Rec Asbestos contamination in soil																
Location Code	**Depth**	**Date**	**Field ID**	**Sample Type**	**Matrix Type**	**Lab Report Number**										
BH101	0.05 - 0.2	2/11/2018	BH101 0.05-0.2M	Normal	soil	626759	No asbestos detected at the reporting limit of 0.01% w/w.	<2	<0.4	18	<5	<5	<0.1	<5	11	<0.1
BH101	0.8 - 1	2/11/2018	BH101 0.8-1.0M	Normal	soil	626759	-	3.5	<0.4	25	9.1	7.5	<0.1	9.3	14	<0.1
BH103	0.05 - 0.2	2/11/2018	BH103 0.05-0.2M	Normal	soil	626759	No asbestos detected at the reporting limit of 0.01% w/w.	<2	<0.4	26	12	46	<0.1	27	37	<0.1
BH104	0.05 - 0.2	2/11/2018	BH104 0.05-0.2M	Normal	soil	626759	No asbestos detected at the reporting limit of 0.01% w/w.	5.5	<0.4	54	19	6.6	<0.1	59	31	<0.1
BH104	0.4 - 0.5	2/11/2018	BH104 0.4-0.5M	Normal	soil	626759	-	<2	<0.4	20	<5	<5	<0.1	9.2	8.0	<0.1
BH105	0.05 - 0.2	30/10/2018	BH105_0.05-0.2	Normal	soil	626158	No asbestos detected at the reporting limit of 0.01% w/w.	2.3	<0.4	22	11	13	0.1	9.0	40	<0.1
BH105	0.9 - 1.1	30/10/2018	BH105_0.9-1.1	Normal	soil	626158	-	4.8	<0.4	35	12	12	<0.1	22	28	<0.1
BH106	0.1 - 0.2	30/10/2018	BH106_0.1-0.2	Normal	soil	626158	No asbestos detected at the reporting limit of 0.01% w/w.	3.1	<0.4	21	9.3	12	<0.1	7.9	32	<0.1
BH112	0.05 - 0.2	31/10/2018	BH112_0.05-0.2	Normal	soil	626158	No asbestos detected at the reporting limit of 0.01% w/w.	-	-	-	-	-	-	-	-	-
BH112	0.8 - 1	31/10/2018	BH112_0.8-1.0	Normal	soil	626158	-	2.9	<0.4	19	6.5	8.9	<0.1	11	12	<0.1
BH113	0.05 - 0.2	2/11/2018	BH113_0.05-0.2	Normal	soil	626158	No asbestos detected at the reporting limit of 0.01% w/w.	4.9	<0.4	27	13	12	<0.1	13	51	<0.1
BH115	0.05 - 0.2	31/10/2018	BH115_0.05-0.2	Normal	soil	626158	No asbestos detected at the reporting limit of 0.01% w/w.	3.8	<0.4	30	13	15	<0.1	22	39	<0.1
BH116	0.05 - 0.2	1/11/2018	BH116_0.05-0.2	Normal	soil	626158	-	4.5	<0.4	46	12	20	<0.1	38	40	<0.1
BH116	0.3 - 0.5	1/11/2018	BH116_0.3-0.5	Normal	soil	626158	No asbestos detected at the reporting limit of 0.01% w/w.	-	-	-	-	-	-	-	-	-
BH116	0.6 - 0.8	1/11/2018	BH116_0.6-0.8	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-
BH116	0.9 - 1.1	1/11/2018	BH116_0.9-1.1	Normal	soil	626158	-	3.9	<0.4	19	5.8	8.1	<0.1	7.6	9.4	<0.1
TP122	0 - 0.1	8/11/2018	QA04	Interlab_D	soil	ES1833667	-	<5	<1	13	6	6	<0.1	4	21	<0.2
TP122	0 - 0.1	8/11/2018	TP122_0.0_0.1	Normal	soil	627011	-	2.1	<0.4	16	7.0	6.9	<0.1	5.7	26	<0.1
TP122	0.2 - 0.3	8/11/2018	TP122_0.2_0.3	Normal	soil	627011	**FA Chrysotile asbestos detected in weathered fibre cement fragments below reporting limit**	-	-	-	-	-	-	-	-	-
TP122	0.6 - 0.7	8/11/2018	TP122_0.6_0.7	Normal	soil	627011	-	2.4	<0.4	25	6.2	6.1	<0.1	8.5	11	<0.1
TP123	0 - 0.1	8/11/2018	TP123_0.0_0.1	Normal	soil	627011	No asbestos detected at the reporting limit of 0.001% w/w.*	2.9	<0.4	21	15	53	<0.1	9.5	41	<0.1
TP124	0 - 0.1	8/11/2018	QA01	Field_D	soil	627011	-	2.7	<0.4	37	15	75	<0.1	47	52	<0.1
TP124	0 - 0.1	8/11/2018	QA02	Interlab_D	soil	ES1833667	-	<5	<1	19	9	18	<0.1	19	41	<0.2
TP124	0 - 0.1	8/11/2018	TP124_0.0_0.1	Normal	soil	627011	**Chrysotile asbestos detected in fibre cement fragments.**	2.5	<0.4	27	11	14	<0.1	26	41	<0.1
TP124	0.6 - 0.7	8/11/2018	TP124_0.6_0.7	Normal	soil	627011	-	<2	<0.4	24	5.3	7.6	<0.1	15	11	<0.1
TP125	0.2 - 0.3	8/11/2018	TP125_0.2_0.3	Normal	soil	627011	No asbestos detected at the reporting limit of 0.001% w/w.*	2.2	<0.4	22	17	10	<0.1	7.8	17	<0.1

Comments

#1 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe important and should be considered where
#2 In the absence of a guideline value for total chromium, chromium VI value adopted
#3 Lead: HILs A,B,C based on blood lead models (IEUBK & HIL D on adult lead model for where 50% bioavailability considere
#4 Elemental mercury: HIL does not address elemental mercury. a site specific assessment should be considered if elemental
#5 Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application should consider presence of carcinoge
#6 Carcinogenic PAHs: HIL based on 8 carc. PAHs & their TEFs (rel to BaP ref Schedule 7) BaP TEQ calc by multiplying the c
#7 PCBs: HIL refers to non-dioxin like PCBs only. Where PCB source is known, or suspected at a site, a site-specific assessm
#8 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#9 To obtain F2 subtract napthalene from the >C10 - C16 fraction.
#10 Not limiting: Derived soil HSL exceeds soil saturation concentration
#11 Only applies where the FA & AF are able to be quantified by gravimetric procedures. Not applicable to free fibres.
#12 Nil

								BTEXN							TRH - NEPM 2013							TRH - NEPM 1999			
								Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	Naphthalene (BTEXN)	BTEX (Sum of Total) - Lab Calc	F1 (C6-C10 minus BTEX)	C6-C10 Fraction	F2 (>C10-C16 minus Naphthalene)	>C10-C16 Fraction	F3 (>C16-C34 Fraction)	F4 (>C34-C40 Fraction)	>C10-C40 (Sum of Total)	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction
								mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL								0.1	0.1	0.1	0.2	0.3	0.5	0.2	10	10	50	50	100	100	50	10	20	50	50
NEPM 2013 Table 1A(1) HIL B Res																									
NEPM 2013 Table 1A(1) HIL C Rec																									
NEPM 2013 Table 1A(3) HSL A/B Res Soil for Vapour Intrusion, Sand																									
0-1m								160	55			40	3		45[#8]		110[#9]								
NEPM 2013 Table 7 HSL C Rec Asbestos contamination in soil																									
Location Code	**Depth**	**Date**	**Field ID**	**Sample Type**	**Matrix Type**	**Lab Report Number**																			
BH101	0.05 - 0.2	2/11/2018	BH101 0.05-0.2M	Normal	soil	626759		<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50
BH101	0.8 - 1	2/11/2018	BH101 0.8-1.0M	Normal	soil	626759		<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50
BH103	0.05 - 0.2	2/11/2018	BH103 0.05-0.2M	Normal	soil	626759		<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50
BH104	0.05 - 0.2	2/11/2018	BH104 0.05-0.2M	Normal	soil	626759		<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50
BH104	0.4 - 0.5	2/11/2018	BH104 0.4-0.5M	Normal	soil	626759		<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50
BH105	0.05 - 0.2	30/10/2018	BH105_0.05-0.2	Normal	soil	626158		<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50
BH105	0.9 - 1.1	30/10/2018	BH105_0.9-1.1	Normal	soil	626158		<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50
BH106	0.1 - 0.2	30/10/2018	BH106_0.1-0.2	Normal	soil	626158		<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50
BH112	0.05 - 0.2	31/10/2018	BH112_0.05-0.2	Normal	soil	626158		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH112	0.8 - 1	31/10/2018	BH112_0.8-1.0	Normal	soil	626158		<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50
BH113	0.05 - 0.2	2/11/2018	BH113_0.05-0.2	Normal	soil	626158		<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50
BH115	0.05 - 0.2	31/10/2018	BH115_0.05-0.2	Normal	soil	626158		<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100	<100	<20	28	75	<50
BH116	0.05 - 0.2	1/11/2018	BH116_0.05-0.2	Normal	soil	626158		<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50
BH116	0.3 - 0.5	1/11/2018	BH116_0.3-0.5	Normal	soil	626158		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH116	0.6 - 0.8	1/11/2018	BH116_0.6-0.8	Normal	soil	626158		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH116	0.9 - 1.1	1/11/2018	BH116_0.9-1.1	Normal	soil	626158		<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50
TP122	0 - 0.1	8/11/2018	QA04	Interlab_D	soil	ES1833667		<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.2	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100
TP122	0 - 0.1	8/11/2018	TP122_0.0_0.1	Normal	soil	627011		<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50
TP122	0.2 - 0.3	8/11/2018	TP122_0.2_0.3	Normal	soil	627011		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP122	0.6 - 0.7	8/11/2018	TP122_0.6_0.7	Normal	soil	627011		<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50
TP123	0 - 0.1	8/11/2018	TP123_0.0_0.1	Normal	soil	627011		<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50
TP124	0 - 0.1	8/11/2018	QA01	Field_D	soil	627011		<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	110	<100	110	<20	<20	72	57
TP124	0 - 0.1	8/11/2018	QA02	Interlab_D	soil	ES1833667		<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.2	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100	<100
TP124	0 - 0.1	8/11/2018	TP124_0.0_0.1	Normal	soil	627011		<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	120	<100	120	<20	<20	77	66
TP124	0.6 - 0.7	8/11/2018	TP124_0.6_0.7	Normal	soil	627011		<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50
TP125	0.2 - 0.3	8/11/2018	TP125_0.2_0.3	Normal	soil	627011		<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50

Comments

#1 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe important and should be considered where
#2 In the absence of a guideline value for total chromium, chromium VI value adopted
#3 Lead: HILs A,B,C based on blood lead models (IEUBK & HIL D on adult lead model for where 50% bioavailability considere
#4 Elemental mercury: HIL does not address elemental mercury. a site specific assessment should be considered if elemental
#5 Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application should consider presence of carcinoge
#6 Carcinogenic PAHs: HIL based on 8 carc. PAHs & their TEFs (rel to BaP ref Schedule 7) BaP TEQ calc by multiplying the c
#7 PCBs: HIL refers to non-dioxin like PCBs only. Where PCB source is known, or suspected at a site, a site-specific assessm
#8 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#9 To obtain F2 subtract napthalene from the >C10 - C16 fraction.
#10 Not limiting: Derived soil HSL exceeds soil saturation concentration
#11 Only applies where the FA & AF are able to be quantified by gravimetric procedures. Not applicable to free fibres.
#12 Nil

		PAHs																	
	C10-C36 (Sum of Total)	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo[b+j]fluoranthene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Naphthalene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene-PAH	Phenanthrene	Pyrene
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	50	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
NEPM 2013 Table 1A(1) HIL B Res																		
NEPM 2013 Table 1A(1) HIL C Rec																		
NEPM 2013 Table 1A(3) HSL A/B Res Soil for Vapour Intrusion, Sand																		
0-1m													3			3		
NEPM 2013 Table 7 HSL C Rec Asbestos contamination in soil																		
Location Code	**Depth**	**Date**	**Field ID**	**Sample Type**	**Matrix Type**	**Lab Report Number**													
BH101	0.05 - 0.2	2/11/2018	BH101 0.05-0.2M	Normal	soil	626759	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
BH101	0.8 - 1	2/11/2018	BH101 0.8-1.0M	Normal	soil	626759	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
BH103	0.05 - 0.2	2/11/2018	BH103 0.05-0.2M	Normal	soil	626759	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
BH104	0.05 - 0.2	2/11/2018	BH104 0.05-0.2M	Normal	soil	626759	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
BH104	0.4 - 0.5	2/11/2018	BH104 0.4-0.5M	Normal	soil	626759	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
BH105	0.05 - 0.2	30/10/2018	BH105_0.05-0.2	Normal	soil	626158	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
BH105	0.9 - 1.1	30/10/2018	BH105_0.9-1.1	Normal	soil	626158	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
BH106	0.1 - 0.2	30/10/2018	BH106_0.1-0.2	Normal	soil	626158	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
BH112	0.05 - 0.2	31/10/2018	BH112_0.05-0.2	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH112	0.8 - 1	31/10/2018	BH112_0.8-1.0	Normal	soil	626158	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
BH113	0.05 - 0.2	2/11/2018	BH113_0.05-0.2	Normal	soil	626158	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
BH115	0.05 - 0.2	31/10/2018	BH115_0.05-0.2	Normal	soil	626158	103	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
BH116	0.05 - 0.2	1/11/2018	BH116_0.05-0.2	Normal	soil	626158	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
BH116	0.3 - 0.5	1/11/2018	BH116_0.3-0.5	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH116	0.6 - 0.8	1/11/2018	BH116_0.6-0.8	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH116	0.9 - 1.1	1/11/2018	BH116_0.9-1.1	Normal	soil	626158	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
TP122	0 - 0.1	8/11/2018	QA04	Interlab_D	soil	ES1833667	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
TP122	0 - 0.1	8/11/2018	TP122_0.0_0.1	Normal	soil	627011	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
TP122	0.2 - 0.3	8/11/2018	TP122_0.2_0.3	Normal	soil	627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP122	0.6 - 0.7	8/11/2018	TP122_0.6_0.7	Normal	soil	627011	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
TP123	0 - 0.1	8/11/2018	TP123_0.0_0.1	Normal	soil	627011	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
TP124	0 - 0.1	8/11/2018	QA01	Field_D	soil	627011	129	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
TP124	0 - 0.1	8/11/2018	QA02	Interlab_D	soil	ES1833667	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
TP124	0 - 0.1	8/11/2018	TP124_0.0_0.1	Normal	soil	627011	143	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
TP124	0.6 - 0.7	8/11/2018	TP124_0.6_0.7	Normal	soil	627011	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
TP125	0.2 - 0.3	8/11/2018	TP125_0.2_0.3	Normal	soil	627011	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5

Comments

#1 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe important and should be considered where
#2 In the absence of a guideline value for total chromium, chromium VI value adopted
#3 Lead: HILs A,B,C based on blood lead models (IEUBK & HIL D on adult lead model for where 50% bioavailability considere
#4 Elemental mercury: HIL does not address elemental mercury. a site specific assessment should be considered if elemental
#5 Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application should consider presence of carcinoge
#6 Carcinogenic PAHs: HIL based on 8 carc. PAHs & their TEFs (rel to BaP ref Schedule 7) BaP TEQ calc by multiplying the c
#7 PCBs: HIL refers to non-dioxin like PCBs only. Where PCB source is known, or suspected at a site, a site-specific assessm
#8 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#9 To obtain F2 subtract napthalene from the >C10 - C16 fraction.
#10 Not limiting: Derived soil HSL exceeds soil saturation concentration
#11 Only applies where the FA & AF are able to be quantified by gravimetric procedures. Not applicable to free fibres.
#12 Nil

																					OC Pesticides		
						PAHs (Sum of total) - Lab calc	Total 8 PAHs (as BaP TEQ)(zero LOR) - Lab Calc	Total 8 PAHs (as BaP TEQ)(half LOR) - Lab Calc	Total 8 PAHs (as BaP TEQ)(full LOR) - Lab Calc	Organochlorine pesticides EPAVic	Other organochlorine pesticides EPAVic	4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane	d-BHC	4,4 DDD	4,4 DDT	DDT+DDE+DDD - Lab Calc	Dieldrin	Endosulfan I (alpha)
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL						0.5	0.5	0.5	0.5	0.1	0.1	0.05	0.05	0.05	0.05	0.05	0.1	0.05	0.05	0.05	0.05	0.05	0.05
NEPM 2013 Table 1A(1) HIL B Res						400[#5]	4[#6]	4[#6]	4[#6]						10		90				600		
NEPM 2013 Table 1A(1) HIL C Rec						300[#5]	3[#6]	3[#6]	3[#6]						10		70				400		
NEPM 2013 Table 1A(3) HSL A/B Res Soil for Vapour Intrusion, Sand																							
0-1m																							
NEPM 2013 Table 7 HSL C Rec Asbestos contamination in soil																							
Location Code	**Depth**	**Date**	**Field ID**	**Sample Type**	**Matrix Type**	**Lab Report Number**																	
BH101	0.05 - 0.2	2/11/2018	BH101 0.05-0.2M	Normal	soil	626759	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BH101	0.8 - 1	2/11/2018	BH101 0.8-1.0M	Normal	soil	626759	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BH103	0.05 - 0.2	2/11/2018	BH103 0.05-0.2M	Normal	soil	626759	<0.5	<0.5	0.6	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH104	0.05 - 0.2	2/11/2018	BH104 0.05-0.2M	Normal	soil	626759	<0.5	<0.5	0.6	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH104	0.4 - 0.5	2/11/2018	BH104 0.4-0.5M	Normal	soil	626759	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BH105	0.05 - 0.2	30/10/2018	BH105_0.05-0.2	Normal	soil	626158	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BH105	0.9 - 1.1	30/10/2018	BH105_0.9-1.1	Normal	soil	626158	<0.5	<0.5	0.6	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH106	0.1 - 0.2	30/10/2018	BH106_0.1-0.2	Normal	soil	626158	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BH112	0.05 - 0.2	31/10/2018	BH112_0.05-0.2	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH112	0.8 - 1	31/10/2018	BH112_0.8-1.0	Normal	soil	626158	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BH113	0.05 - 0.2	2/11/2018	BH113_0.05-0.2	Normal	soil	626158	<0.5	<0.5	0.6	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH115	0.05 - 0.2	31/10/2018	BH115_0.05-0.2	Normal	soil	626158	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BH116	0.05 - 0.2	1/11/2018	BH116_0.05-0.2	Normal	soil	626158	<0.5	<0.5	0.6	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH116	0.3 - 0.5	1/11/2018	BH116_0.3-0.5	Normal	soil	626158	-	-	-	-	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BH116	0.6 - 0.8	1/11/2018	BH116_0.6-0.8	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH116	0.9 - 1.1	1/11/2018	BH116_0.9-1.1	Normal	soil	626158	<0.5	<0.5	0.6	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP122	0 - 0.1	8/11/2018	QA04	Interlab_D	soil	ES1833667	<0.5	<0.5	0.6	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP122	0 - 0.1	8/11/2018	TP122_0.0_0.1	Normal	soil	627011	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP122	0.2 - 0.3	8/11/2018	TP122_0.2_0.3	Normal	soil	627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP122	0.6 - 0.7	8/11/2018	TP122_0.6_0.7	Normal	soil	627011	<0.5	<0.5	0.6	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP123	0 - 0.1	8/11/2018	TP123_0.0_0.1	Normal	soil	627011	<0.5	<0.5	0.6	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP124	0 - 0.1	8/11/2018	QA01	Field_D	soil	627011	<0.5	<0.5	0.6	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP124	0 - 0.1	8/11/2018	QA02	Interlab_D	soil	ES1833667	<0.5	<0.5	0.6	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP124	0 - 0.1	8/11/2018	TP124_0.0_0.1	Normal	soil	627011	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP124	0.6 - 0.7	8/11/2018	TP124_0.6_0.7	Normal	soil	627011	<0.5	<0.5	0.6	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP125	0.2 - 0.3	8/11/2018	TP125_0.2_0.3	Normal	soil	627011	<0.5	<0.5	0.6	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Comments

#1 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe important and should be considered where
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#8 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#9 To obtain F2 subtract napthalene from the >C10 - C16 fraction.
#10 Not limiting: Derived soil HSL exceeds soil saturation concentration
#11 Only applies where the FA & AF are able to be quantified by gravimetric procedures. Not applicable to free fibres.
#12 Nil

							Endosulfan II (beta)	Endosulfan Sulfate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor	Toxaphene	Tokuthion	Azinphos methyl	Bolstar (Sulprofos)	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Coumaphos
							mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL							0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	1	0.2	0.2	0.2	0.2	0.2	0.2	2
NEPM 2013 Table 1A(1) HIL B Res									20				10		15	500	30					340		
NEPM 2013 Table 1A(1) HIL C Rec									20				10		10	400	30					250		
NEPM 2013 Table 1A(3) HSL A/B Res Soil for Vapour Intrusion, Sand																								
0-1m																								
NEPM 2013 Table 7 HSL C Rec Asbestos contamination in soil																								
Location Code	**Depth**	**Date**	**Field ID**	**Sample Type**	**Matrix Type**	**Lab Report Number**																		
BH101	0.05 - 0.2	2/11/2018	BH101 0.05-0.2M	Normal	soil	626759	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2
BH101	0.8 - 1	2/11/2018	BH101 0.8-1.0M	Normal	soil	626759	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2
BH103	0.05 - 0.2	2/11/2018	BH103 0.05-0.2M	Normal	soil	626759	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH104	0.05 - 0.2	2/11/2018	BH104 0.05-0.2M	Normal	soil	626759	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH104	0.4 - 0.5	2/11/2018	BH104 0.4-0.5M	Normal	soil	626759	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2
BH105	0.05 - 0.2	30/10/2018	BH105_0.05-0.2	Normal	soil	626158	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2
BH105	0.9 - 1.1	30/10/2018	BH105_0.9-1.1	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH106	0.1 - 0.2	30/10/2018	BH106_0.1-0.2	Normal	soil	626158	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2
BH112	0.05 - 0.2	31/10/2018	BH112_0.05-0.2	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH112	0.8 - 1	31/10/2018	BH112_0.8-1.0	Normal	soil	626158	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2
BH113	0.05 - 0.2	2/11/2018	BH113_0.05-0.2	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH115	0.05 - 0.2	31/10/2018	BH115_0.05-0.2	Normal	soil	626158	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2
BH116	0.05 - 0.2	1/11/2018	BH116_0.05-0.2	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH116	0.3 - 0.5	1/11/2018	BH116_0.3-0.5	Normal	soil	626158	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2
BH116	0.6 - 0.8	1/11/2018	BH116_0.6-0.8	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH116	0.9 - 1.1	1/11/2018	BH116_0.9-1.1	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP122	0 - 0.1	8/11/2018	QA04	Interlab_D	soil	ES1833667	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP122	0 - 0.1	8/11/2018	TP122_0.0_0.1	Normal	soil	627011	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2
TP122	0.2 - 0.3	8/11/2018	TP122_0.2_0.3	Normal	soil	627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP122	0.6 - 0.7	8/11/2018	TP122_0.6_0.7	Normal	soil	627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP123	0 - 0.1	8/11/2018	TP123_0.0_0.1	Normal	soil	627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP124	0 - 0.1	8/11/2018	QA01	Field_D	soil	627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP124	0 - 0.1	8/11/2018	QA02	Interlab_D	soil	ES1833667	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP124	0 - 0.1	8/11/2018	TP124_0.0_0.1	Normal	soil	627011	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2
TP124	0.6 - 0.7	8/11/2018	TP124_0.6_0.7	Normal	soil	627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP125	0.2 - 0.3	8/11/2018	TP125_0.2_0.3	Normal	soil	627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Comments

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#9 To obtain F2 subtract napthalene from the >C10 - C16 fraction.
#10 Not limiting: Derived soil HSL exceeds soil saturation concentration
#11 Only applies where the FA & AF are able to be quantified by gravimetric procedures. Not applicable to free fibres.
#12 Nil

							OP Pesticides													
							Demeton-O	Demeton-S	Diazinon	Dichlorvos	Dimethoate	Disulfoton	EPN	Ethion	Ethoprop	Fenitrothion	Fensulfothion	Fenthion	Malathion	Merphos	Methyl parathion	Mevinphos (Phosdrin)	Monocrotophos	Naled (Dibrom)
							mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL							0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2	0.2
NEPM 2013 Table 1A(1) HIL B Res																								
NEPM 2013 Table 1A(1) HIL C Rec																								
NEPM 2013 Table 1A(3) HSL A/B Res Soil for Vapour Intrusion, Sand																								
0-1m																								
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BH101	0.05 - 0.2	2/11/2018	BH101 0.05-0.2M	Normal	soil	626759	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
BH101	0.8 - 1	2/11/2018	BH101 0.8-1.0M	Normal	soil	626759	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
BH103	0.05 - 0.2	2/11/2018	BH103 0.05-0.2M	Normal	soil	626759	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH104	0.05 - 0.2	2/11/2018	BH104 0.05-0.2M	Normal	soil	626759	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH104	0.4 - 0.5	2/11/2018	BH104 0.4-0.5M	Normal	soil	626759	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
BH105	0.05 - 0.2	30/10/2018	BH105_0.05-0.2	Normal	soil	626158	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
BH105	0.9 - 1.1	30/10/2018	BH105_0.9-1.1	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH106	0.1 - 0.2	30/10/2018	BH106_0.1-0.2	Normal	soil	626158	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
BH112	0.05 - 0.2	31/10/2018	BH112_0.05-0.2	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH112	0.8 - 1	31/10/2018	BH112_0.8-1.0	Normal	soil	626158	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
BH113	0.05 - 0.2	2/11/2018	BH113_0.05-0.2	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH115	0.05 - 0.2	31/10/2018	BH115_0.05-0.2	Normal	soil	626158	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
BH116	0.05 - 0.2	1/11/2018	BH116_0.05-0.2	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH116	0.3 - 0.5	1/11/2018	BH116_0.3-0.5	Normal	soil	626158	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
BH116	0.6 - 0.8	1/11/2018	BH116_0.6-0.8	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH116	0.9 - 1.1	1/11/2018	BH116_0.9-1.1	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP122	0 - 0.1	8/11/2018	QA04	Interlab_D	soil	ES1833667	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP122	0 - 0.1	8/11/2018	TP122_0.0_0.1	Normal	soil	627011	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
TP122	0.2 - 0.3	8/11/2018	TP122_0.2_0.3	Normal	soil	627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP122	0.6 - 0.7	8/11/2018	TP122_0.6_0.7	Normal	soil	627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP123	0 - 0.1	8/11/2018	TP123_0.0_0.1	Normal	soil	627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP124	0 - 0.1	8/11/2018	QA01	Field_D	soil	627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP124	0 - 0.1	8/11/2018	QA02	Interlab_D	soil	ES1833667	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP124	0 - 0.1	8/11/2018	TP124_0.0_0.1	Normal	soil	627011	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
TP124	0.6 - 0.7	8/11/2018	TP124_0.6_0.7	Normal	soil	627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP125	0.2 - 0.3	8/11/2018	TP125_0.2_0.3	Normal	soil	627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Comments

#1 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe important and should be considered where
#2 In the absence of a guideline value for total chromium, chromium VI value adopted
#3 Lead: HILs A,B,C based on blood lead models (IEUBK & HIL D on adult lead model for where 50% bioavailability considere
#4 Elemental mercury: HIL does not address elemental mercury. a site specific assessment should be considered if elemental
#5 Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application should consider presence of carcinoge
#6 Carcinogenic PAHs: HIL based on 8 carc. PAHs & their TEFs (rel to BaP ref Schedule 7) BaP TEQ calc by multiplying the c
#7 PCBs: HIL refers to non-dioxin like PCBs only. Where PCB source is known, or suspected at a site, a site-specific assessm
#8 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#9 To obtain F2 subtract napthalene from the >C10 - C16 fraction.
#10 Not limiting: Derived soil HSL exceeds soil saturation concentration
#11 Only applies where the FA & AF are able to be quantified by gravimetric procedures. Not applicable to free fibres.
#12 Nil

																			PCBs	
							Omethoate	Parathion	Phorate	Pirimiphos-methyl	Pyrazophos	Ronnel	Terbufos	Trichloronate	Tetrachlorvinphos	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	PCBs (Total)
							mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL							2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
NEPM 2013 Table 1A(1) HIL B Res																							1[#7]
NEPM 2013 Table 1A(1) HIL C Rec																							1[#7]
NEPM 2013 Table 1A(3) HSL A/B Res Soil for Vapour Intrusion, Sand																							
0-1m																							
NEPM 2013 Table 7 HSL C Rec Asbestos contamination in soil																							
Location Code	**Depth**	**Date**	**Field ID**	**Sample Type**	**Matrix Type**	**Lab Report Number**																	
BH101	0.05 - 0.2	2/11/2018	BH101 0.05-0.2M	Normal	soil	626759	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH101	0.8 - 1	2/11/2018	BH101 0.8-1.0M	Normal	soil	626759	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH103	0.05 - 0.2	2/11/2018	BH103 0.05-0.2M	Normal	soil	626759	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH104	0.05 - 0.2	2/11/2018	BH104 0.05-0.2M	Normal	soil	626759	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH104	0.4 - 0.5	2/11/2018	BH104 0.4-0.5M	Normal	soil	626759	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH105	0.05 - 0.2	30/10/2018	BH105_0.05-0.2	Normal	soil	626158	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH105	0.9 - 1.1	30/10/2018	BH105_0.9-1.1	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH106	0.1 - 0.2	30/10/2018	BH106_0.1-0.2	Normal	soil	626158	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH112	0.05 - 0.2	31/10/2018	BH112_0.05-0.2	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH112	0.8 - 1	31/10/2018	BH112_0.8-1.0	Normal	soil	626158	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH113	0.05 - 0.2	2/11/2018	BH113_0.05-0.2	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH115	0.05 - 0.2	31/10/2018	BH115_0.05-0.2	Normal	soil	626158	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH116	0.05 - 0.2	1/11/2018	BH116_0.05-0.2	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH116	0.3 - 0.5	1/11/2018	BH116_0.3-0.5	Normal	soil	626158	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH116	0.6 - 0.8	1/11/2018	BH116_0.6-0.8	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH116	0.9 - 1.1	1/11/2018	BH116_0.9-1.1	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP122	0 - 0.1	8/11/2018	QA04	Interlab_D	soil	ES1833667	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP122	0 - 0.1	8/11/2018	TP122_0.0_0.1	Normal	soil	627011	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP122	0.2 - 0.3	8/11/2018	TP122_0.2_0.3	Normal	soil	627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP122	0.6 - 0.7	8/11/2018	TP122_0.6_0.7	Normal	soil	627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP123	0 - 0.1	8/11/2018	TP123_0.0_0.1	Normal	soil	627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP124	0 - 0.1	8/11/2018	QA01	Field_D	soil	627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP124	0 - 0.1	8/11/2018	QA02	Interlab_D	soil	ES1833667	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP124	0 - 0.1	8/11/2018	TP124_0.0_0.1	Normal	soil	627011	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TP124	0.6 - 0.7	8/11/2018	TP124_0.6_0.7	Normal	soil	627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP125	0.2 - 0.3	8/11/2018	TP125_0.2_0.3	Normal	soil	627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Comments

#1 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe important and should be considered where
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#8 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#9 To obtain F2 subtract napthalene from the >C10 - C16 fraction.
#10 Not limiting: Derived soil HSL exceeds soil saturation concentration
#11 Only applies where the FA & AF are able to be quantified by gravimetric procedures. Not applicable to free fibres.
#12 Nil

										BTEXN								TRH - NEPM 2013							TRH - NEPM 19		
										Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	Naphthalene (BTEXN)	BTEX (Sum of Total) - Lab Calc	F1 (C6-C10 minus BTEX)	C6-C10 Fraction	F2 (>C10-C16 minus Naphthalene)	>C10-C16 Fraction	F3 (>C16-C34 Fraction)	F4 (>C34-C40 Fraction)	>C10-C40 (Sum of Total)	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction
										mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL										0.1	0.1	0.1	0.1	0.2	0.3	0.5	0.2	10	10	50	50	100	100	50	10	20	50
CRC CARE 2011 Soil Direct Contact HSL-C Recreational / Open Space										120	18,000	5,300			15,000	1,900		5,100		3,800		5,300	7,400				
CRC CARE 2011 Soil Direct Contact HSL-D Commercial / Industrial										430	99,000	27,000			81,000	11,000		26,000		20,000		27,000	38,000				
Location Code	**Depth**	**Date**	**Field ID**	**Sample Type**	**Matrix Type**	**Lab Report Number**																					
BH101	0.05 - 0.2	2/11/2018	BH101 0.05-0.2M	Normal	soil	626759				<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50
BH101	0.8 - 1	2/11/2018	BH101 0.8-1.0M	Normal	soil	626759				<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50
BH103	0.05 - 0.2	2/11/2018	BH103 0.05-0.2M	Normal	soil	626759				<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50
BH104	0.05 - 0.2	2/11/2018	BH104 0.05-0.2M	Normal	soil	626759				<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50
BH104	0.4 - 0.5	2/11/2018	BH104 0.4-0.5M	Normal	soil	626759				<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50
BH105	0.05 - 0.2	30/10/2018	BH105_0.05-0.2	Normal	soil	626158				<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50
BH105	0.9 - 1.1	30/10/2018	BH105_0.9-1.1	Normal	soil	626158				<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50
BH106	0.1 - 0.2	30/10/2018	BH106_0.1-0.2	Normal	soil	626158				<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50
BH112	0.05 - 0.2	31/10/2018	BH112_0.05-0.2	Normal	soil	626158				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH112	0.8 - 1	31/10/2018	BH112_0.8-1.0	Normal	soil	626158				<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50
BH113	0.05 - 0.2	2/11/2018	BH113_0.05-0.2	Normal	soil	626158				<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50
BH115	0.05 - 0.2	31/10/2018	BH115_0.05-0.2	Normal	soil	626158				<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100	<100	<20	28	75
BH116	0.05 - 0.2	1/11/2018	BH116_0.05-0.2	Normal	soil	626158				<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50
BH116	0.3 - 0.5	1/11/2018	BH116_0.3-0.5	Normal	soil	626158				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH116	0.6 - 0.8	1/11/2018	BH116_0.6-0.8	Normal	soil	626158				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH116	0.9 - 1.1	1/11/2018	BH116_0.9-1.1	Normal	soil	626158				<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50
TP122	0 - 0.1	8/11/2018	QA04	Interlab_D	soil	ES1833667				<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.2	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100
TP122	0 - 0.1	8/11/2018	TP122_0.0_0.1	Normal	soil	627011				<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50
TP122	0.2 - 0.3	8/11/2018	TP122_0.2_0.3	Normal	soil	627011				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP122	0.6 - 0.7	8/11/2018	TP122_0.6_0.7	Normal	soil	627011				<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50
TP123	0 - 0.1	8/11/2018	TP123_0.0_0.1	Normal	soil	627011				<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50
TP124	0 - 0.1	8/11/2018	QA01	Field_D	soil	627011				<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	110	<100	110	<20	<20	72
TP124	0 - 0.1	8/11/2018	QA02	Interlab_D	soil	ES1833667				<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.2	<10	<10	<50	<50	<100	<100	<50	<10	<50	<100
TP124	0 - 0.1	8/11/2018	TP124_0.0_0.1	Normal	soil	627011				<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	120	<100	120	<20	<20	77
TP124	0.6 - 0.7	8/11/2018	TP124_0.6_0.7	Normal	soil	627011				<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50
TP125	0.2 - 0.3	8/11/2018	TP125_0.2_0.3	Normal	soil	627011				<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50

Comments
#1 Nil

							99		PAHs														
							C29-C36 Fraction	C10-C36 (Sum of Total)	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo[b+j]fluoranthene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Naphthalene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene-PAH	Phenanthrene
							mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL							50	50	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
CRC CARE 2011 Soil Direct Contact HSL-C Recreational / Open Space																				1,900			1,900	
CRC CARE 2011 Soil Direct Contact HSL-D Commercial / Industrial																				11,000			11,000	
Location Code	**Depth**	**Date**	**Field ID**	**Sample Type**	**Matrix Type**	**Lab Report Number**																		
BH101	0.05 - 0.2	2/11/2018	BH101 0.05-0.2M	Normal	soil	626759	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5
BH101	0.8 - 1	2/11/2018	BH101 0.8-1.0M	Normal	soil	626759	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5
BH103	0.05 - 0.2	2/11/2018	BH103 0.05-0.2M	Normal	soil	626759	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5
BH104	0.05 - 0.2	2/11/2018	BH104 0.05-0.2M	Normal	soil	626759	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5
BH104	0.4 - 0.5	2/11/2018	BH104 0.4-0.5M	Normal	soil	626759	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5
BH105	0.05 - 0.2	30/10/2018	BH105_0.05-0.2	Normal	soil	626158	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5
BH105	0.9 - 1.1	30/10/2018	BH105_0.9-1.1	Normal	soil	626158	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5
BH106	0.1 - 0.2	30/10/2018	BH106_0.1-0.2	Normal	soil	626158	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5
BH112	0.05 - 0.2	31/10/2018	BH112_0.05-0.2	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH112	0.8 - 1	31/10/2018	BH112_0.8-1.0	Normal	soil	626158	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5
BH113	0.05 - 0.2	2/11/2018	BH113_0.05-0.2	Normal	soil	626158	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5
BH115	0.05 - 0.2	31/10/2018	BH115_0.05-0.2	Normal	soil	626158	<50	103	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5
BH116	0.05 - 0.2	1/11/2018	BH116_0.05-0.2	Normal	soil	626158	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5
BH116	0.3 - 0.5	1/11/2018	BH116_0.3-0.5	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH116	0.6 - 0.8	1/11/2018	BH116_0.6-0.8	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH116	0.9 - 1.1	1/11/2018	BH116_0.9-1.1	Normal	soil	626158	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5
TP122	0 - 0.1	8/11/2018	QA04	Interlab_D	soil	ES1833667	<100	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5
TP122	0 - 0.1	8/11/2018	TP122_0.0_0.1	Normal	soil	627011	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5
TP122	0.2 - 0.3	8/11/2018	TP122_0.2_0.3	Normal	soil	627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP122	0.6 - 0.7	8/11/2018	TP122_0.6_0.7	Normal	soil	627011	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5
TP123	0 - 0.1	8/11/2018	TP123_0.0_0.1	Normal	soil	627011	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5
TP124	0 - 0.1	8/11/2018	QA01	Field_D	soil	627011	57	129	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5
TP124	0 - 0.1	8/11/2018	QA02	Interlab_D	soil	ES1833667	<100	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5
TP124	0 - 0.1	8/11/2018	TP124_0.0_0.1	Normal	soil	627011	66	143	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5
TP124	0.6 - 0.7	8/11/2018	TP124_0.6_0.7	Normal	soil	627011	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5
TP125	0.2 - 0.3	8/11/2018	TP125_0.2_0.3	Normal	soil	627011	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5

Comments
#1 Nil

							Pyrene	PAHs (Sum of total) - Lab calc	Total 8 PAHs (as BaP TEQ)(zero LOR) - Lab Calc	Total 8 PAHs (as BaP TEQ)(half LOR) - Lab Calc	Total 8 PAHs (as BaP TEQ)(full LOR) - Lab Calc
							mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL							0.5	0.5	0.5	0.5	0.5
CRC CARE 2011 Soil Direct Contact HSL-C Recreational / Open Space											
CRC CARE 2011 Soil Direct Contact HSL-D Commercial / Industrial											
Location Code	**Depth**	**Date**	**Field ID**	**Sample Type**	**Matrix Type**	**Lab Report Number**					
BH101	0.05 - 0.2	2/11/2018	BH101 0.05-0.2M	Normal	soil	626759	<0.5	<0.5	<0.5	0.6	1.2
BH101	0.8 - 1	2/11/2018	BH101 0.8-1.0M	Normal	soil	626759	<0.5	<0.5	<0.5	0.6	1.2
BH103	0.05 - 0.2	2/11/2018	BH103 0.05-0.2M	Normal	soil	626759	<0.5	<0.5	<0.5	0.6	1.2
BH104	0.05 - 0.2	2/11/2018	BH104 0.05-0.2M	Normal	soil	626759	<0.5	<0.5	<0.5	0.6	1.2
BH104	0.4 - 0.5	2/11/2018	BH104 0.4-0.5M	Normal	soil	626759	<0.5	<0.5	<0.5	0.6	1.2
BH105	0.05 - 0.2	30/10/2018	BH105_0.05-0.2	Normal	soil	626158	<0.5	<0.5	<0.5	0.6	1.2
BH105	0.9 - 1.1	30/10/2018	BH105_0.9-1.1	Normal	soil	626158	<0.5	<0.5	<0.5	0.6	1.2
BH106	0.1 - 0.2	30/10/2018	BH106_0.1-0.2	Normal	soil	626158	<0.5	<0.5	<0.5	0.6	1.2
BH112	0.05 - 0.2	31/10/2018	BH112_0.05-0.2	Normal	soil	626158	-	-	-	-	-
BH112	0.8 - 1	31/10/2018	BH112_0.8-1.0	Normal	soil	626158	<0.5	<0.5	<0.5	0.6	1.2
BH113	0.05 - 0.2	2/11/2018	BH113_0.05-0.2	Normal	soil	626158	<0.5	<0.5	<0.5	0.6	1.2
BH115	0.05 - 0.2	31/10/2018	BH115_0.05-0.2	Normal	soil	626158	<0.5	<0.5	<0.5	0.6	1.2
BH116	0.05 - 0.2	1/11/2018	BH116_0.05-0.2	Normal	soil	626158	<0.5	<0.5	<0.5	0.6	1.2
BH116	0.3 - 0.5	1/11/2018	BH116_0.3-0.5	Normal	soil	626158	-	-	-	-	-
BH116	0.6 - 0.8	1/11/2018	BH116_0.6-0.8	Normal	soil	626158	-	-	-	-	-
BH116	0.9 - 1.1	1/11/2018	BH116_0.9-1.1	Normal	soil	626158	<0.5	<0.5	<0.5	0.6	1.2
TP122	0 - 0.1	8/11/2018	QA04	Interlab_D	soil	ES1833667	<0.5	<0.5	<0.5	0.6	1.2
TP122	0 - 0.1	8/11/2018	TP122_0.0_0.1	Normal	soil	627011	<0.5	<0.5	<0.5	0.6	1.2
TP122	0.2 - 0.3	8/11/2018	TP122_0.2_0.3	Normal	soil	627011	-	-	-	-	-
TP122	0.6 - 0.7	8/11/2018	TP122_0.6_0.7	Normal	soil	627011	<0.5	<0.5	<0.5	0.6	1.2
TP123	0 - 0.1	8/11/2018	TP123_0.0_0.1	Normal	soil	627011	<0.5	<0.5	<0.5	0.6	1.2
TP124	0 - 0.1	8/11/2018	QA01	Field_D	soil	627011	<0.5	<0.5	<0.5	0.6	1.2
TP124	0 - 0.1	8/11/2018	QA02	Interlab_D	soil	ES1833667	<0.5	<0.5	<0.5	0.6	1.2
TP124	0 - 0.1	8/11/2018	TP124_0.0_0.1	Normal	soil	627011	<0.5	<0.5	<0.5	0.6	1.2
TP124	0.6 - 0.7	8/11/2018	TP124_0.6_0.7	Normal	soil	627011	<0.5	<0.5	<0.5	0.6	1.2
TP125	0.2 - 0.3	8/11/2018	TP125_0.2_0.3	Normal	soil	627011	<0.5	<0.5	<0.5	0.6	1.2

Comments
#1 Nil

							Inorganics				Particle Size Analysis	Exchangeable cations				
							Moisture (%)	Electrical conductivity (lab)	Moisture Content (dried @ 103°C)	pH (aqueous extract)	Clay (<2 µm)	CEC	Organic Fibres - Comment	Respirable Fibres - Comment	Asbestos from ACM in Soil	Asbestos from FA & AF in Soil
							%	µS/cm	%	pH Units	%	meq/100g	Comment	Comment	%w/w	%w/w
EQL							1	10	1	0.1	1	0.05				
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																
NEPM 2013 EIL-Urban Residential- Public Open Space																
0-2m																
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil																
0-2m																
Location Code	**Depth**	**Date**	**Field ID**	**Sample Type**	**Matrix Type**	**Lab Report Number**										
BH101	0.05 - 0.2	2/11/2018	BH101 0.05-0.2M	Normal	soil	626759	-	-	3.3	-	-	-	Organic fibres detected.	No respirable fibres detected.	-	-
BH101	0.8 - 1	2/11/2018	BH101 0.8-1.0M	Normal	soil	626759	-	-	9.8	-	-	-	-	-	-	-
BH103	0.05 - 0.2	2/11/2018	BH103 0.05-0.2M	Normal	soil	626759	-	-	16	-	-	-	Organic fibres detected.	No respirable fibres detected.	-	-
BH104	0.05 - 0.2	2/11/2018	BH104 0.05-0.2M	Normal	soil	626759	-	-	6.2	-	-	-	Organic fibres detected.	No respirable fibres detected.	-	-
BH104	0.4 - 0.5	2/11/2018	BH104 0.4-0.5M	Normal	soil	626759	-	-	5.7	-	-	-	-	-	-	-
BH105	0.05 - 0.2	30/10/2018	BH105_0.05-0.2	Normal	soil	626158	-	-	6.2	-	-	-	Organic fibres detected.	No respirable fibres detected.	-	-
BH105	0.9 - 1.1	30/10/2018	BH105_0.9-1.1	Normal	soil	626158	-	260	15	8.3	11	29	-	-	-	-
BH106	0.1 - 0.2	30/10/2018	BH106_0.1-0.2	Normal	soil	626158	-	-	4.8	-	-	-	Organic fibres detected.	No respirable fibres detected.	-	-
BH112	0.05 - 0.2	31/10/2018	BH112_0.05-0.2	Normal	soil	626158	-	-	-	-	-	-	Organic fibres detected.	No respirable fibres detected.	-	-
BH112	0.8 - 1	31/10/2018	BH112_0.8-1.0	Normal	soil	626158	-	-	6.8	-	-	-	-	-	-	-
BH113	0.05 - 0.2	2/11/2018	BH113_0.05-0.2	Normal	soil	626158	-	-	7.0	-	-	-	Organic fibres detected.	No respirable fibres detected.	-	-
BH115	0.05 - 0.2	31/10/2018	BH115_0.05-0.2	Normal	soil	626158	-	-	19	-	-	-	Organic fibres detected.	No respirable fibres detected.	-	-
BH116	0.05 - 0.2	1/11/2018	BH116_0.05-0.2	Normal	soil	626158	-	-	6.0	-	-	-	-	-	-	-
BH116	0.3 - 0.5	1/11/2018	BH116_0.3-0.5	Normal	soil	626158	-	-	5.2	-	-	-	Organic fibres detected.	No respirable fibres detected.	0.0000	0.0000
BH116	0.6 - 0.8	1/11/2018	BH116_0.6-0.8	Normal	soil	626158	-	170	7.6	7.0	7.5	15	-	-	-	-
BH116	0.9 - 1.1	1/11/2018	BH116_0.9-1.1	Normal	soil	626158	-	-	11	-	-	-	-	-	-	-
TP122	0 - 0.1	8/11/2018	QA04	Interlab_D	soil	ES1833667	21.2	-	-	-	-	-	-	-	-	-
TP122	0 - 0.1	8/11/2018	TP122_0.0_0.1	Normal	soil	627011	-	-	17	-	-	-	-	-	-	-
TP122	0.2 - 0.3	8/11/2018	TP122_0.2_0.3	Normal	soil	627011	-	-	-	-	-	-	Organic fibres detected.	No respirable fibres detected.	0.0000	0.000032
TP122	0.6 - 0.7	8/11/2018	TP122_0.6_0.7	Normal	soil	627011	-	-	13	-	-	-	-	-	-	-
TP123	0 - 0.1	8/11/2018	TP123_0.0_0.1	Normal	soil	627011	-	-	13	-	-	-	Organic fibres detected.	No respirable fibres detected.	0.0000	0.0000
TP124	0 - 0.1	8/11/2018	QA01	Field_D	soil	627011	-	-	13	-	-	-	-	-	-	-
TP124	0 - 0.1	8/11/2018	QA02	Interlab_D	soil	ES1833667	12.4	-	-	-	-	-	-	-	-	-
TP124	0 - 0.1	8/11/2018	TP124_0.0_0.1	Normal	soil	627011	-	-	13	-	-	-	Organic fibres detected.	No respirable fibres detected.	0.0436	0.0000
TP124	0.6 - 0.7	8/11/2018	TP124_0.6_0.7	Normal	soil	627011	-	-	4.8	-	-	-	-	-	-	-
TP125	0.2 - 0.3	8/11/2018	TP125_0.2_0.3	Normal	soil	627011	-	-	6.4	-	-	-	Organic fibres detected.	No respirable fibres detected.	0.0000	0.0000

Comments

#1 Separate management limits for BTEX & napthalene are not available hence should not be subtracted from the relevant fractions to obtain F1 & F2

#2 Develop site specific based on CEC, pH, clay content, state and traffic volume

#3 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.

#4 Errata 30 April 2014 - Naphthalene should not be subtracted from >C10-C16 (as there is no separate ESL for naphthalene)

#5 Nil

		Asbestos	Metals						
		Asbestos Reported Result	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel
		Comment	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL			2	0.4	2	5	5	0.1	2
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil									
NEPM 2013 EIL-Urban Residential- Public Open Space									
0-2m			100		410	230	1,100		350
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil									
0-2m									
Location Code	**Depth**	**Date**	**Field ID**	**Sample Type**	**Matrix Type**	**Lab Report Number**							
BH101	0.05 - 0.2	2/11/2018	BH101 0.05-0.2M	Normal	soil	626759	No asbestos detected at the reporting limit of 0.01% w/w.	<2	<0.4	18	<5	<5	<0.1	<5
BH101	0.8 - 1	2/11/2018	BH101 0.8-1.0M	Normal	soil	626759	-	3.5	<0.4	25	9.1	7.5	<0.1	9.3
BH103	0.05 - 0.2	2/11/2018	BH103 0.05-0.2M	Normal	soil	626759	No asbestos detected at the reporting limit of 0.01% w/w.	<2	<0.4	26	12	46	<0.1	27
BH104	0.05 - 0.2	2/11/2018	BH104 0.05-0.2M	Normal	soil	626759	No asbestos detected at the reporting limit of 0.01% w/w.	5.5	<0.4	54	19	6.6	<0.1	59
BH104	0.4 - 0.5	2/11/2018	BH104 0.4-0.5M	Normal	soil	626759	-	<2	<0.4	20	<5	<5	<0.1	9.2
BH105	0.05 - 0.2	30/10/2018	BH105_0.05-0.2	Normal	soil	626158	No asbestos detected at the reporting limit of 0.01% w/w.	2.3	<0.4	22	11	13	0.1	9.0
BH105	0.9 - 1.1	30/10/2018	BH105_0.9-1.1	Normal	soil	626158	-	4.8	<0.4	35	12	12	<0.1	22
BH106	0.1 - 0.2	30/10/2018	BH106_0.1-0.2	Normal	soil	626158	No asbestos detected at the reporting limit of 0.01% w/w.	3.1	<0.4	21	9.3	12	<0.1	7.9
BH112	0.05 - 0.2	31/10/2018	BH112_0.05-0.2	Normal	soil	626158	No asbestos detected at the reporting limit of 0.01% w/w.	-	-	-	-	-	-	-
BH112	0.8 - 1	31/10/2018	BH112_0.8-1.0	Normal	soil	626158	-	2.9	<0.4	19	6.5	8.9	<0.1	11
BH113	0.05 - 0.2	2/11/2018	BH113_0.05-0.2	Normal	soil	626158	No asbestos detected at the reporting limit of 0.01% w/w.	4.9	<0.4	27	13	12	<0.1	13
BH115	0.05 - 0.2	31/10/2018	BH115_0.05-0.2	Normal	soil	626158	No asbestos detected at the reporting limit of 0.01% w/w.	3.8	<0.4	30	13	15	<0.1	22
BH116	0.05 - 0.2	1/11/2018	BH116_0.05-0.2	Normal	soil	626158	-	4.5	<0.4	46	12	20	<0.1	38
BH116	0.3 - 0.5	1/11/2018	BH116_0.3-0.5	Normal	soil	626158	No asbestos detected at the reporting limit of 0.01% w/w.	-	-	-	-	-	-	-
BH116	0.6 - 0.8	1/11/2018	BH116_0.6-0.8	Normal	soil	626158	-	-	-	-	-	-	-	-
BH116	0.9 - 1.1	1/11/2018	BH116_0.9-1.1	Normal	soil	626158	-	3.9	<0.4	19	5.8	8.1	<0.1	7.6
TP122	0 - 0.1	8/11/2018	QA04	Interlab_D	soil	ES1833667	-	<5	<1	13	6	6	<0.1	4
TP122	0 - 0.1	8/11/2018	TP122_0.0_0.1	Normal	soil	627011	-	2.1	<0.4	16	7.0	6.9	<0.1	5.7
TP122	0.2 - 0.3	8/11/2018	TP122_0.2_0.3	Normal	soil	627011	**FA Chrysotile asbestos detected in weathered fibre cement fragments below reporting limit**	-	-	-	-	-	-	-
TP122	0.6 - 0.7	8/11/2018	TP122_0.6_0.7	Normal	soil	627011	-	2.4	<0.4	25	6.2	6.1	<0.1	8.5
TP123	0 - 0.1	8/11/2018	TP123_0.0_0.1	Normal	soil	627011	No asbestos detected at the reporting limit of 0.001% w/w.*	2.9	<0.4	21	15	53	<0.1	9.5
TP124	0 - 0.1	8/11/2018	QA01	Field_D	soil	627011	-	2.7	<0.4	37	15	75	<0.1	47
TP124	0 - 0.1	8/11/2018	QA02	Interlab_D	soil	ES1833667	-	<5	<1	19	9	18	<0.1	19
TP124	0 - 0.1	8/11/2018	TP124_0.0_0.1	Normal	soil	627011	**Chrysotile asbestos detected in fibre cement fragments.**	2.5	<0.4	27	11	14	<0.1	26
TP124	0.6 - 0.7	8/11/2018	TP124_0.6_0.7	Normal	soil	627011	-	<2	<0.4	24	5.3	7.6	<0.1	15
TP125	0.2 - 0.3	8/11/2018	TP125_0.2_0.3	Normal	soil	627011	No asbestos detected at the reporting limit of 0.001% w/w.*	2.2	<0.4	22	17	10	<0.1	7.8

Comments

#1 Separate management limits for BTEX & napthalene are not available hence should not be subtracted from the relevai

#2 Develop site specific based on CEC, pH, clay content, state and traffic volume

#3 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.

#4 Errata 30 April 2014 - Naphthalene should not be subtracted from >C10-C16 (as there is no separate ESL for naphtha

#5 Nil

		BTEXN								TRH - NEPM 2013					
	Zinc	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	Naphthalene (BTEXN)	BTEX (Sum of Total) - Lab Calc	F1 (C6-C10 minus BTEX)	C6-C10 Fraction	F2 (>C10-C16 minus Naphthalene)	>C10-C16 Fraction	F3 (>C16-C34 Fraction)	F4 (>C34-C40 Fraction)
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	5	0.1	0.1	0.1	0.1	0.2	0.3	0.5	0.2	10	10	50	50	100	100
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil											700[#1]		1,000[#1]	2,500	10,000
NEPM 2013 EIL-Urban Residential- Public Open Space															
0-2m	1000							170							
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil															
0-2m		50	85	70			105			180[#3]			120[#4]	300	2,800

Location Code	Depth	Date	Field ID	Sample Type	Matrix Type	Lab Report Number													
BH101	0.05 - 0.2	2/11/2018	BH101 0.05-0.2M	Normal	soil	626759	11	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100
BH101	0.8 - 1	2/11/2018	BH101 0.8-1.0M	Normal	soil	626759	14	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100
BH103	0.05 - 0.2	2/11/2018	BH103 0.05-0.2M	Normal	soil	626759	37	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100
BH104	0.05 - 0.2	2/11/2018	BH104 0.05-0.2M	Normal	soil	626759	31	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100
BH104	0.4 - 0.5	2/11/2018	BH104 0.4-0.5M	Normal	soil	626759	8.0	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100
BH105	0.05 - 0.2	30/10/2018	BH105_0.05-0.2	Normal	soil	626158	40	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100
BH105	0.9 - 1.1	30/10/2018	BH105_0.9-1.1	Normal	soil	626158	28	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100
BH106	0.1 - 0.2	30/10/2018	BH106_0.1-0.2	Normal	soil	626158	32	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100
BH112	0.05 - 0.2	31/10/2018	BH112_0.05-0.2	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH112	0.8 - 1	31/10/2018	BH112_0.8-1.0	Normal	soil	626158	12	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100
BH113	0.05 - 0.2	2/11/2018	BH113_0.05-0.2	Normal	soil	626158	51	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100
BH115	0.05 - 0.2	31/10/2018	BH115_0.05-0.2	Normal	soil	626158	39	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100
BH116	0.05 - 0.2	1/11/2018	BH116_0.05-0.2	Normal	soil	626158	40	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100
BH116	0.3 - 0.5	1/11/2018	BH116_0.3-0.5	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH116	0.6 - 0.8	1/11/2018	BH116_0.6-0.8	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH116	0.9 - 1.1	1/11/2018	BH116_0.9-1.1	Normal	soil	626158	9.4	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100
TP122	0 - 0.1	8/11/2018	QA04	Interlab_D	soil	ES1833667	21	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.2	<10	<10	<50	<50	<100	<100
TP122	0 - 0.1	8/11/2018	TP122_0.0_0.1	Normal	soil	627011	26	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100
TP122	0.2 - 0.3	8/11/2018	TP122_0.2_0.3	Normal	soil	627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP122	0.6 - 0.7	8/11/2018	TP122_0.6_0.7	Normal	soil	627011	11	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100
TP123	0 - 0.1	8/11/2018	TP123_0.0_0.1	Normal	soil	627011	41	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100
TP124	0 - 0.1	8/11/2018	QA01	Field_D	soil	627011	52	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	110	<100
TP124	0 - 0.1	8/11/2018	QA02	Interlab_D	soil	ES1833667	41	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.2	<10	<10	<50	<50	<100	<100
TP124	0 - 0.1	8/11/2018	TP124_0.0_0.1	Normal	soil	627011	41	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	120	<100
TP124	0.6 - 0.7	8/11/2018	TP124_0.6_0.7	Normal	soil	627011	11	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100
TP125	0.2 - 0.3	8/11/2018	TP125_0.2_0.3	Normal	soil	627011	17	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	<20	<20	<50	<50	<100	<100

Comments

#1 Separate management limits for BTEX & napthalene are not available hence should not be subtracted from the relevai

#2 Develop site specific based on CEC, pH, clay content, state and traffic volume

#3 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.

#4 Errata 30 April 2014 - Naphthalene should not be subtracted from >C10-C16 (as there is no separate ESL for naphtha

#5 Nil

									TRH - NEPM 1999																
								>C10-C40 (Sum of Total)	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 (Sum of Total)	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo[b+j]fluoranthene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene
								mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL								50	10	20	50	50	50	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																						
NEPM 2013 EIL-Urban Residential- Public Open Space																						
0-2m																						
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil																						
0-2m																		0.7				
Location Code	**Depth**	**Date**	**Field ID**	**Sample Type**	**Matrix Type**	**Lab Report Number**																
BH101	0.05 - 0.2	2/11/2018	BH101 0.05-0.2M	Normal	soil	626759		<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH101	0.8 - 1	2/11/2018	BH101 0.8-1.0M	Normal	soil	626759		<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH103	0.05 - 0.2	2/11/2018	BH103 0.05-0.2M	Normal	soil	626759		<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH104	0.05 - 0.2	2/11/2018	BH104 0.05-0.2M	Normal	soil	626759		<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH104	0.4 - 0.5	2/11/2018	BH104 0.4-0.5M	Normal	soil	626759		<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH105	0.05 - 0.2	30/10/2018	BH105_0.05-0.2	Normal	soil	626158		<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH105	0.9 - 1.1	30/10/2018	BH105_0.9-1.1	Normal	soil	626158		<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH106	0.1 - 0.2	30/10/2018	BH106_0.1-0.2	Normal	soil	626158		<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH112	0.05 - 0.2	31/10/2018	BH112_0.05-0.2	Normal	soil	626158		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH112	0.8 - 1	31/10/2018	BH112_0.8-1.0	Normal	soil	626158		<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH113	0.05 - 0.2	2/11/2018	BH113_0.05-0.2	Normal	soil	626158		<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH115	0.05 - 0.2	31/10/2018	BH115_0.05-0.2	Normal	soil	626158		<100	<20	28	75	<50	103	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH116	0.05 - 0.2	1/11/2018	BH116_0.05-0.2	Normal	soil	626158		<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH116	0.3 - 0.5	1/11/2018	BH116_0.3-0.5	Normal	soil	626158		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH116	0.6 - 0.8	1/11/2018	BH116_0.6-0.8	Normal	soil	626158		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH116	0.9 - 1.1	1/11/2018	BH116_0.9-1.1	Normal	soil	626158		<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TP122	0 - 0.1	8/11/2018	QA04	Interlab_D	soil	ES1833667		<50	<10	<50	<100	<100	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TP122	0 - 0.1	8/11/2018	TP122_0.0_0.1	Normal	soil	627011		<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TP122	0.2 - 0.3	8/11/2018	TP122_0.2_0.3	Normal	soil	627011		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP122	0.6 - 0.7	8/11/2018	TP122_0.6_0.7	Normal	soil	627011		<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TP123	0 - 0.1	8/11/2018	TP123_0.0_0.1	Normal	soil	627011		<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TP124	0 - 0.1	8/11/2018	QA01	Field_D	soil	627011		110	<20	<20	72	57	129	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TP124	0 - 0.1	8/11/2018	QA02	Interlab_D	soil	ES1833667		<50	<10	<50	<100	<100	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TP124	0 - 0.1	8/11/2018	TP124_0.0_0.1	Normal	soil	627011		120	<20	<20	77	66	143	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TP124	0.6 - 0.7	8/11/2018	TP124_0.6_0.7	Normal	soil	627011		<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TP125	0.2 - 0.3	8/11/2018	TP125_0.2_0.3	Normal	soil	627011		<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Comments

#1 Separate management limits for BTEX & napthalene are not available hence should not be subtracted from the relevai

#2 Develop site specific based on CEC, pH, clay content, state and traffic volume

#3 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.

#4 Errata 30 April 2014 - Naphthalene should not be subtracted from >C10-C16 (as there is no separate ESL for naphtha

#5 Nil

							PAHs													
							Dibenz(a,h)anthracene	Fluoranthene	Naphthalene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene-PAH	Phenanthrene	Pyrene	PAHs (Sum of total) - Lab calc	Total 8 PAHs (as BaP TEQ)(zero LOR) - Lab Calc	Total 8 PAHs (as BaP TEQ)(half LOR) - Lab Calc	Total 8 PAHs (as BaP TEQ)(full LOR) - Lab Calc	Organochlorine pesticides EPAVic	Other organochlorine pesticides EPAVic	4,4-DDE
							mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL							0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.1	0.1	0.05
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																					
NEPM 2013 EIL-Urban Residential- Public Open Space																					
0-2m									170			170									
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil																					
0-2m																					
Location Code	**Depth**	**Date**	**Field ID**	**Sample Type**	**Matrix Type**	**Lab Report Number**															
BH101	0.05 - 0.2	2/11/2018	BH101 0.05-0.2M	Normal	soil	626759	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.05
BH101	0.8 - 1	2/11/2018	BH101 0.8-1.0M	Normal	soil	626759	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.05
BH103	0.05 - 0.2	2/11/2018	BH103 0.05-0.2M	Normal	soil	626759	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	-	-
BH104	0.05 - 0.2	2/11/2018	BH104 0.05-0.2M	Normal	soil	626759	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	-	-
BH104	0.4 - 0.5	2/11/2018	BH104 0.4-0.5M	Normal	soil	626759	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.05
BH105	0.05 - 0.2	30/10/2018	BH105_0.05-0.2	Normal	soil	626158	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.05
BH105	0.9 - 1.1	30/10/2018	BH105_0.9-1.1	Normal	soil	626158	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	-	-
BH106	0.1 - 0.2	30/10/2018	BH106_0.1-0.2	Normal	soil	626158	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.05
BH112	0.05 - 0.2	31/10/2018	BH112_0.05-0.2	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH112	0.8 - 1	31/10/2018	BH112_0.8-1.0	Normal	soil	626158	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.05
BH113	0.05 - 0.2	2/11/2018	BH113_0.05-0.2	Normal	soil	626158	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	-	-
BH115	0.05 - 0.2	31/10/2018	BH115_0.05-0.2	Normal	soil	626158	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.05
BH116	0.05 - 0.2	1/11/2018	BH116_0.05-0.2	Normal	soil	626158	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	-	-
BH116	0.3 - 0.5	1/11/2018	BH116_0.3-0.5	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	<0.05
BH116	0.6 - 0.8	1/11/2018	BH116_0.6-0.8	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH116	0.9 - 1.1	1/11/2018	BH116_0.9-1.1	Normal	soil	626158	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	-	-
TP122	0 - 0.1	8/11/2018	QA04	Interlab_D	soil	ES1833667	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	-	-
TP122	0 - 0.1	8/11/2018	TP122_0.0_0.1	Normal	soil	627011	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.05
TP122	0.2 - 0.3	8/11/2018	TP122_0.2_0.3	Normal	soil	627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP122	0.6 - 0.7	8/11/2018	TP122_0.6_0.7	Normal	soil	627011	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	-	-
TP123	0 - 0.1	8/11/2018	TP123_0.0_0.1	Normal	soil	627011	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	-	-
TP124	0 - 0.1	8/11/2018	QA01	Field_D	soil	627011	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	-	-
TP124	0 - 0.1	8/11/2018	QA02	Interlab_D	soil	ES1833667	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	-	-
TP124	0 - 0.1	8/11/2018	TP124_0.0_0.1	Normal	soil	627011	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.05
TP124	0.6 - 0.7	8/11/2018	TP124_0.6_0.7	Normal	soil	627011	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	-	-
TP125	0.2 - 0.3	8/11/2018	TP125_0.2_0.3	Normal	soil	627011	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	-	-

Comments

#1 Separate management limits for BTEX & napthalene are not available hence should not be subtracted from the relevai

#2 Develop site specific based on CEC, pH, clay content, state and traffic volume

#3 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.

#4 Errata 30 April 2014 - Naphthalene should not be subtracted from >C10-C16 (as there is no separate ESL for naphtha

#5 Nil

										OC Pesticides							
						a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane	d-BHC	4,4 DDD	4,4 DDT	DDT+DDE+DDD - Lab Calc	Dieldrin	Endosulfan I (alpha)	Endosulfan II (beta)	Endosulfan Sulfate	Endrin	Endrin aldehyde
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL						0.05	0.05	0.05	0.05	0.1	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																				
NEPM 2013 EIL-Urban Residential- Public Open Space																				
0-2m													180	180						
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil																				
0-2m																				
Location Code	**Depth**	**Date**	**Field ID**	**Sample Type**	**Matrix Type**	**Lab Report Number**														
BH101	0.05 - 0.2	2/11/2018	BH101 0.05-0.2M	Normal	soil	626759	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BH101	0.8 - 1	2/11/2018	BH101 0.8-1.0M	Normal	soil	626759	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BH103	0.05 - 0.2	2/11/2018	BH103 0.05-0.2M	Normal	soil	626759	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH104	0.05 - 0.2	2/11/2018	BH104 0.05-0.2M	Normal	soil	626759	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH104	0.4 - 0.5	2/11/2018	BH104 0.4-0.5M	Normal	soil	626759	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BH105	0.05 - 0.2	30/10/2018	BH105_0.05-0.2	Normal	soil	626158	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BH105	0.9 - 1.1	30/10/2018	BH105_0.9-1.1	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH106	0.1 - 0.2	30/10/2018	BH106_0.1-0.2	Normal	soil	626158	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BH112	0.05 - 0.2	31/10/2018	BH112_0.05-0.2	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH112	0.8 - 1	31/10/2018	BH112_0.8-1.0	Normal	soil	626158	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BH113	0.05 - 0.2	2/11/2018	BH113_0.05-0.2	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH115	0.05 - 0.2	31/10/2018	BH115_0.05-0.2	Normal	soil	626158	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BH116	0.05 - 0.2	1/11/2018	BH116_0.05-0.2	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH116	0.3 - 0.5	1/11/2018	BH116_0.3-0.5	Normal	soil	626158	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BH116	0.6 - 0.8	1/11/2018	BH116_0.6-0.8	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH116	0.9 - 1.1	1/11/2018	BH116_0.9-1.1	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP122	0 - 0.1	8/11/2018	QA04	Interlab_D	soil	ES1833667	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP122	0 - 0.1	8/11/2018	TP122_0.0_0.1	Normal	soil	627011	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP122	0.2 - 0.3	8/11/2018	TP122_0.2_0.3	Normal	soil	627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP122	0.6 - 0.7	8/11/2018	TP122_0.6_0.7	Normal	soil	627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP123	0 - 0.1	8/11/2018	TP123_0.0_0.1	Normal	soil	627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP124	0 - 0.1	8/11/2018	QA01	Field_D	soil	627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP124	0 - 0.1	8/11/2018	QA02	Interlab_D	soil	ES1833667	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP124	0 - 0.1	8/11/2018	TP124_0.0_0.1	Normal	soil	627011	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TP124	0.6 - 0.7	8/11/2018	TP124_0.6_0.7	Normal	soil	627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP125	0.2 - 0.3	8/11/2018	TP125_0.2_0.3	Normal	soil	627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Comments

#1 Separate management limits for BTEX & napthalene are not available hence should not be subtracted from the relevai

#2 Develop site specific based on CEC, pH, clay content, state and traffic volume

#3 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.

#4 Errata 30 April 2014 - Naphthalene should not be subtracted from >C10-C16 (as there is no separate ESL for naphtha

#5 Nil

	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor	Toxaphene	Tokuthion	Azinphos methyl	Bolstar (Sulprofos)	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Coumaphos	Demeton-O
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.05	0.05	0.05	0.05	0.05	0.05	1	0.2	0.2	0.2	0.2	0.2	0.2	2	0.2
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil															
NEPM 2013 EIL-Urban Residential- Public Open Space															
0-2m															
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil															
0-2m															
Location Code **Depth** **Date** **Field ID** **Sample Type** **Matrix Type** **Lab Report Number**															
BH101 0.05 - 0.2 2/11/2018 BH101 0.05-0.2M Normal soil 626759	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
BH101 0.8 - 1 2/11/2018 BH101 0.8-1.0M Normal soil 626759	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
BH103 0.05 - 0.2 2/11/2018 BH103 0.05-0.2M Normal soil 626759	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH104 0.05 - 0.2 2/11/2018 BH104 0.05-0.2M Normal soil 626759	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH104 0.4 - 0.5 2/11/2018 BH104 0.4-0.5M Normal soil 626759	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
BH105 0.05 - 0.2 30/10/2018 BH105_0.05-0.2 Normal soil 626158	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
BH105 0.9 - 1.1 30/10/2018 BH105_0.9-1.1 Normal soil 626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH106 0.1 - 0.2 30/10/2018 BH106_0.1-0.2 Normal soil 626158	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
BH112 0.05 - 0.2 31/10/2018 BH112_0.05-0.2 Normal soil 626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH112 0.8 - 1 31/10/2018 BH112_0.8-1.0 Normal soil 626158	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
BH113 0.05 - 0.2 2/11/2018 BH113_0.05-0.2 Normal soil 626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH115 0.05 - 0.2 31/10/2018 BH115_0.05-0.2 Normal soil 626158	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
BH116 0.05 - 0.2 1/11/2018 BH116_0.05-0.2 Normal soil 626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH116 0.3 - 0.5 1/11/2018 BH116_0.3-0.5 Normal soil 626158	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
BH116 0.6 - 0.8 1/11/2018 BH116_0.6-0.8 Normal soil 626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH116 0.9 - 1.1 1/11/2018 BH116_0.9-1.1 Normal soil 626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP122 0 - 0.1 8/11/2018 QA04 Interlab_D soil ES1833667	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP122 0 - 0.1 8/11/2018 TP122_0.0_0.1 Normal soil 627011	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
TP122 0.2 - 0.3 8/11/2018 TP122_0.2_0.3 Normal soil 627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP122 0.6 - 0.7 8/11/2018 TP122_0.6_0.7 Normal soil 627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP123 0 - 0.1 8/11/2018 TP123_0.0_0.1 Normal soil 627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP124 0 - 0.1 8/11/2018 QA01 Field_D soil 627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP124 0 - 0.1 8/11/2018 QA02 Interlab_D soil ES1833667	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP124 0 - 0.1 8/11/2018 TP124_0.0_0.1 Normal soil 627011	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
TP124 0.6 - 0.7 8/11/2018 TP124_0.6_0.7 Normal soil 627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP125 0.2 - 0.3 8/11/2018 TP125_0.2_0.3 Normal soil 627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Comments

#1 Separate management limits for BTEX & napthalene are not available hence should not be subtracted from the relevai

#2 Develop site specific based on CEC, pH, clay content, state and traffic volume

#3 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.

#4 Errata 30 April 2014 - Naphthalene should not be subtracted from >C10-C16 (as there is no separate ESL for naphtha

#5 Nil

							OP Pesticides													
							Demeton-S	Diazinon	Dichlorvos	Dimethoate	Disulfoton	EPN	Ethion	Ethoprop	Fenitrothion	Fensulfothion	Fenthion	Malathion	Merphos	Methyl parathion	Mevinphos (Phosdrin)
							mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL							0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																					
NEPM 2013 EIL-Urban Residential- Public Open Space																					
0-2m																					
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil																					
0-2m																					
Location Code	**Depth**	**Date**	**Field ID**	**Sample Type**	**Matrix Type**	**Lab Report Number**															
BH101	0.05 - 0.2	2/11/2018	BH101 0.05-0.2M	Normal	soil	626759	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH101	0.8 - 1	2/11/2018	BH101 0.8-1.0M	Normal	soil	626759	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH103	0.05 - 0.2	2/11/2018	BH103 0.05-0.2M	Normal	soil	626759	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH104	0.05 - 0.2	2/11/2018	BH104 0.05-0.2M	Normal	soil	626759	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH104	0.4 - 0.5	2/11/2018	BH104 0.4-0.5M	Normal	soil	626759	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH105	0.05 - 0.2	30/10/2018	BH105_0.05-0.2	Normal	soil	626158	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH105	0.9 - 1.1	30/10/2018	BH105_0.9-1.1	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH106	0.1 - 0.2	30/10/2018	BH106_0.1-0.2	Normal	soil	626158	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH112	0.05 - 0.2	31/10/2018	BH112_0.05-0.2	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH112	0.8 - 1	31/10/2018	BH112_0.8-1.0	Normal	soil	626158	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH113	0.05 - 0.2	2/11/2018	BH113_0.05-0.2	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH115	0.05 - 0.2	31/10/2018	BH115_0.05-0.2	Normal	soil	626158	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH116	0.05 - 0.2	1/11/2018	BH116_0.05-0.2	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH116	0.3 - 0.5	1/11/2018	BH116_0.3-0.5	Normal	soil	626158	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH116	0.6 - 0.8	1/11/2018	BH116_0.6-0.8	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH116	0.9 - 1.1	1/11/2018	BH116_0.9-1.1	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP122	0 - 0.1	8/11/2018	QA04	Interlab_D	soil	ES1833667	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP122	0 - 0.1	8/11/2018	TP122_0.0_0.1	Normal	soil	627011	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
TP122	0.2 - 0.3	8/11/2018	TP122_0.2_0.3	Normal	soil	627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP122	0.6 - 0.7	8/11/2018	TP122_0.6_0.7	Normal	soil	627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP123	0 - 0.1	8/11/2018	TP123_0.0_0.1	Normal	soil	627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP124	0 - 0.1	8/11/2018	QA01	Field_D	soil	627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP124	0 - 0.1	8/11/2018	QA02	Interlab_D	soil	ES1833667	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP124	0 - 0.1	8/11/2018	TP124_0.0_0.1	Normal	soil	627011	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
TP124	0.6 - 0.7	8/11/2018	TP124_0.6_0.7	Normal	soil	627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP125	0.2 - 0.3	8/11/2018	TP125_0.2_0.3	Normal	soil	627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Comments

#1 Separate management limits for BTEX & napthalene are not available hence should not be subtracted from the relevai

#2 Develop site specific based on CEC, pH, clay content, state and traffic volume

#3 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.

#4 Errata 30 April 2014 - Naphthalene should not be subtracted from >C10-C16 (as there is no separate ESL for naphtha

#5 Nil

																				PC
							Monocrotophos	Naled (Dibrom)	Omethoate	Parathion	Phorate	Pirimiphos-methyl	Pyrazophos	Ronnel	Terbufos	Trichloronate	Tetrachlorvinphos	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242
							mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL							2	0.2	2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																					
NEPM 2013 EIL-Urban Residential- Public Open Space																					
0-2m																					
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil																					
0-2m																					
Location Code	**Depth**	**Date**	**Field ID**	**Sample Type**	**Matrix Type**	**Lab Report Number**															
BH101	0.05 - 0.2	2/11/2018	BH101 0.05-0.2M	Normal	soil	626759	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1
BH101	0.8 - 1	2/11/2018	BH101 0.8-1.0M	Normal	soil	626759	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1
BH103	0.05 - 0.2	2/11/2018	BH103 0.05-0.2M	Normal	soil	626759	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH104	0.05 - 0.2	2/11/2018	BH104 0.05-0.2M	Normal	soil	626759	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH104	0.4 - 0.5	2/11/2018	BH104 0.4-0.5M	Normal	soil	626759	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1
BH105	0.05 - 0.2	30/10/2018	BH105_0.05-0.2	Normal	soil	626158	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1
BH105	0.9 - 1.1	30/10/2018	BH105_0.9-1.1	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH106	0.1 - 0.2	30/10/2018	BH106_0.1-0.2	Normal	soil	626158	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1
BH112	0.05 - 0.2	31/10/2018	BH112_0.05-0.2	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH112	0.8 - 1	31/10/2018	BH112_0.8-1.0	Normal	soil	626158	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1
BH113	0.05 - 0.2	2/11/2018	BH113_0.05-0.2	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH115	0.05 - 0.2	31/10/2018	BH115_0.05-0.2	Normal	soil	626158	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1
BH116	0.05 - 0.2	1/11/2018	BH116_0.05-0.2	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH116	0.3 - 0.5	1/11/2018	BH116_0.3-0.5	Normal	soil	626158	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1
BH116	0.6 - 0.8	1/11/2018	BH116_0.6-0.8	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH116	0.9 - 1.1	1/11/2018	BH116_0.9-1.1	Normal	soil	626158	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP122	0 - 0.1	8/11/2018	QA04	Interlab_D	soil	ES1833667	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP122	0 - 0.1	8/11/2018	TP122_0.0_0.1	Normal	soil	627011	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1
TP122	0.2 - 0.3	8/11/2018	TP122_0.2_0.3	Normal	soil	627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP122	0.6 - 0.7	8/11/2018	TP122_0.6_0.7	Normal	soil	627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP123	0 - 0.1	8/11/2018	TP123_0.0_0.1	Normal	soil	627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP124	0 - 0.1	8/11/2018	QA01	Field_D	soil	627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP124	0 - 0.1	8/11/2018	QA02	Interlab_D	soil	ES1833667	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP124	0 - 0.1	8/11/2018	TP124_0.0_0.1	Normal	soil	627011	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1
TP124	0.6 - 0.7	8/11/2018	TP124_0.6_0.7	Normal	soil	627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP125	0.2 - 0.3	8/11/2018	TP125_0.2_0.3	Normal	soil	627011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Comments

#1 Separate management limits for BTEX & napthalene are not available hence should not be subtracted from the relevai

#2 Develop site specific based on CEC, pH, clay content, state and traffic volume

#3 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.

#4 Errata 30 April 2014 - Naphthalene should not be subtracted from >C10-C16 (as there is no separate ESL for naphtha

#5 Nil

	Bs			
	Arochlor 1248	Arochlor 1254	Arochlor 1260	PCBs (Total)
	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.1	0.1	0.1	0.1
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil				
NEPM 2013 EIL-Urban Residential- Public Open Space				
0-2m				
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil				
0-2m				

Location Code	Depth	Date	Field ID	Sample Type	Matrix Type	Lab Report Number				
BH101	0.05 - 0.2	2/11/2018	BH101 0.05-0.2M	Normal	soil	626759	<0.1	<0.1	<0.1	<0.1
BH101	0.8 - 1	2/11/2018	BH101 0.8-1.0M	Normal	soil	626759	<0.1	<0.1	<0.1	<0.1
BH103	0.05 - 0.2	2/11/2018	BH103 0.05-0.2M	Normal	soil	626759	-	-	-	-
BH104	0.05 - 0.2	2/11/2018	BH104 0.05-0.2M	Normal	soil	626759	-	-	-	-
BH104	0.4 - 0.5	2/11/2018	BH104 0.4-0.5M	Normal	soil	626759	<0.1	<0.1	<0.1	<0.1
BH105	0.05 - 0.2	30/10/2018	BH105_0.05-0.2	Normal	soil	626158	<0.1	<0.1	<0.1	<0.1
BH105	0.9 - 1.1	30/10/2018	BH105_0.9-1.1	Normal	soil	626158	-	-	-	-
BH106	0.1 - 0.2	30/10/2018	BH106_0.1-0.2	Normal	soil	626158	<0.1	<0.1	<0.1	<0.1
BH112	0.05 - 0.2	31/10/2018	BH112_0.05-0.2	Normal	soil	626158	-	-	-	-
BH112	0.8 - 1	31/10/2018	BH112_0.8-1.0	Normal	soil	626158	<0.1	<0.1	<0.1	<0.1
BH113	0.05 - 0.2	2/11/2018	BH113_0.05-0.2	Normal	soil	626158	-	-	-	-
BH115	0.05 - 0.2	31/10/2018	BH115_0.05-0.2	Normal	soil	626158	<0.1	<0.1	<0.1	<0.1
BH116	0.05 - 0.2	1/11/2018	BH116_0.05-0.2	Normal	soil	626158	-	-	-	-
BH116	0.3 - 0.5	1/11/2018	BH116_0.3-0.5	Normal	soil	626158	<0.1	<0.1	<0.1	<0.1
BH116	0.6 - 0.8	1/11/2018	BH116_0.6-0.8	Normal	soil	626158	-	-	-	-
BH116	0.9 - 1.1	1/11/2018	BH116_0.9-1.1	Normal	soil	626158	-	-	-	-
TP122	0 - 0.1	8/11/2018	QA04	Interlab_D	soil	ES1833667	-	-	-	-
TP122	0 - 0.1	8/11/2018	TP122_0.0_0.1	Normal	soil	627011	<0.1	<0.1	<0.1	<0.1
TP122	0.2 - 0.3	8/11/2018	TP122_0.2_0.3	Normal	soil	627011	-	-	-	-
TP122	0.6 - 0.7	8/11/2018	TP122_0.6_0.7	Normal	soil	627011	-	-	-	-
TP123	0 - 0.1	8/11/2018	TP123_0.0_0.1	Normal	soil	627011	-	-	-	-
TP124	0 - 0.1	8/11/2018	QA01	Field_D	soil	627011	-	-	-	-
TP124	0 - 0.1	8/11/2018	QA02	Interlab_D	soil	ES1833667	-	-	-	-
TP124	0 - 0.1	8/11/2018	TP124_0.0_0.1	Normal	soil	627011	<0.1	<0.1	<0.1	<0.1
TP124	0.6 - 0.7	8/11/2018	TP124_0.6_0.7	Normal	soil	627011	-	-	-	-
TP125	0.2 - 0.3	8/11/2018	TP125_0.2_0.3	Normal	soil	627011	-	-	-	-

Comments

#1 Separate management limits for BTEX & napthalene are not available hence should not be subtracted from the relevai

#2 Develop site specific based on CEC, pH, clay content, state and traffic volume

#3 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.

#4 Errata 30 April 2014 - Naphthalene should not be subtracted from >C10-C16 (as there is no separate ESL for naphtha

#5 Nil

	Metals								BTEXN							
	Arsenic (filtered)	Cadmium (filtered)	Chromium (III+VI) (filtered)	Copper (filtered)	Lead (filtered)	Mercury (filtered)	Nickel (filtered)	Zinc (filtered)	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	Naphthalene (BTEXN)	F1 (C6-C10 minus BTEX)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL	0.001	0.0002	0.001	0.001	0.001	0.0001	0.001	0.005	1	1	1	1	2	3	10	20
NEPM 2013 Table 1C GILs, Fresh Waters		0.0002[#1]	0.001[#2]	0.0014[#1]	0.0034[#1]	6E-05[#3]	0.011[#1]	0.008[#1]	950			350	200[#4]		16	
NEPM 2013 Table 1C GILs, Drinking Water	0.01	0.002[#1]	0.05	2[#1]	0.01[#1]	0.001	0.02[#1]		1	800	300			600		
NEPM 2013 Table 1A(4) HSL A/B Res GW for Vapour Intrusion, Sand																
4-8m									800	NL[#5]	NL[#5]			NL[#5]	NL[#5]	1,000[#6]
ANZECC 2000 FW Med-Low Reliability	**0.013[#8]**	**0.0002**		**0.0014**	**0.0034**		**0.011**	**0.008**	**950**	**180**	**80**	**350**			**16**	

Location Code	Depth	Date	Field ID	Sample Type	Matrix Type	Lab Report Number												
BH116	5 - 5.1	8/11/2018	BH116	Normal	water	627174	0.003	**0.0005**	<0.001	**0.017**	0.001	<0.0001	**0.019**	**0.027**	<1	<1	2	<1	<2	<3	<10	<20

Comments

#1 Values calculated using hardness of 30 mg/L CaCO3. Refer ANZECC & ARMCANZ (2000) for site specific hardness guidance

#2 Figure may not protect key species from chronic toxicity, refer to ANZECC & ARMCANZ (2000) for further guidance.

#3 Chemical for which possible bioaccumulation and secondary poisoning effects should be considered, refer to ANZECC & ARMCANZ (2000) for further guidance.

#4 Measurement based on value for p-Xylene

#5 Not limiting: Derived water HSL exceeds water solubility limit

#6 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.

#7 To obtain F2 subtract napthalene from the >C10 - C16 fraction.

							TRH - NEPM 2013						TRH - NEPM 1999										
							C6-C10 Fraction	F2 (>C10-C16 minus Naphthalene)	>C10-C16 Fraction	F3 (>C16-C34 Fraction)	F4 (>C34-C40 Fraction)	>C10-C40 (Sum of Total)	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 (Sum of Total)	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo[b+j]fluoranthene
							µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL							20	50	50	100	100	100	20	50	100	100	100	1	1	1	1	1	1
NEPM 2013 Table 1C GILs, Fresh Waters																							
NEPM 2013 Table 1C GILs, Drinking Water																						0.01	
NEPM 2013 Table 1A(4) HSL A/B Res GW for Vapour Intrusion, Sand																							
4-8m								1,000[#7]															
ANZECC 2000 FW Med-Low Reliability																				0.01		0.1	
Location Code	**Depth**	**Date**	**Field ID**	**Sample Type**	**Matrix Type**																		
BH116	5 - 5.1	8/11/2018	BH116	Normal	water		<20	<50	<50	<100	<100	<100	<20	<50	<100	<100	<100	<1	<1	<1	<1	<1	<1

Comments

#1 Values calculated using hardness of 30 mg/L CaCO3. Refer ANZECC & ARMCANZ (2000) for site specific hardness guidance

#2 Figure may not protect key species from chronic toxicity, refer to ANZECC & ARMCANZ (2000) for further guidance.

#3 Chemical for which possible bioaccumulation and secondary poisoning effects should be considered, refer to ANZECC & ARMCANZ (2000) for fi

#4 Measurement based on value for p-Xylene

#5 Not limiting: Derived water HSL exceeds water solubility limit

#6 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.

#7 To obtain F2 subtract napthalene from the >C10 - C16 fraction.

							PAHs										
							Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene-PAH	Phenanthrene	Pyrene	PAHs (Sum of total) - Lab calc
							µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL							1	1	1	1	1	1	1	1	1	1	1
NEPM 2013 Table 1C GILs, Fresh Waters														16			
NEPM 2013 Table 1C GILs, Drinking Water																	
NEPM 2013 Table 1A(4) HSL A/B Res GW for Vapour Intrusion, Sand																	
4-8m														999,999,000[#5]			
ANZECC 2000 FW Med-Low Reliability											**1**			**16**	**0.6**		
Location Code	**Depth**	**Date**	**Field ID**	**Sample Type**	**Matrix Type**												
BH116	5 - 5.1	8/11/2018	BH116	Normal	water		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1

Comments

#1 Values calculated using hardness of 30 mg/L CaCO3. Refer ANZECC & ARMCANZ (2000) for site specific hardness guidance

#2 Figure may not protect key species from chronic toxicity, refer to ANZECC & ARMCANZ (2000) for further guidance.

#3 Chemical for which possible bioaccumulation and secondary poisoning effects should be considered, refer to ANZECC & ARMCANZ (2000) for fi

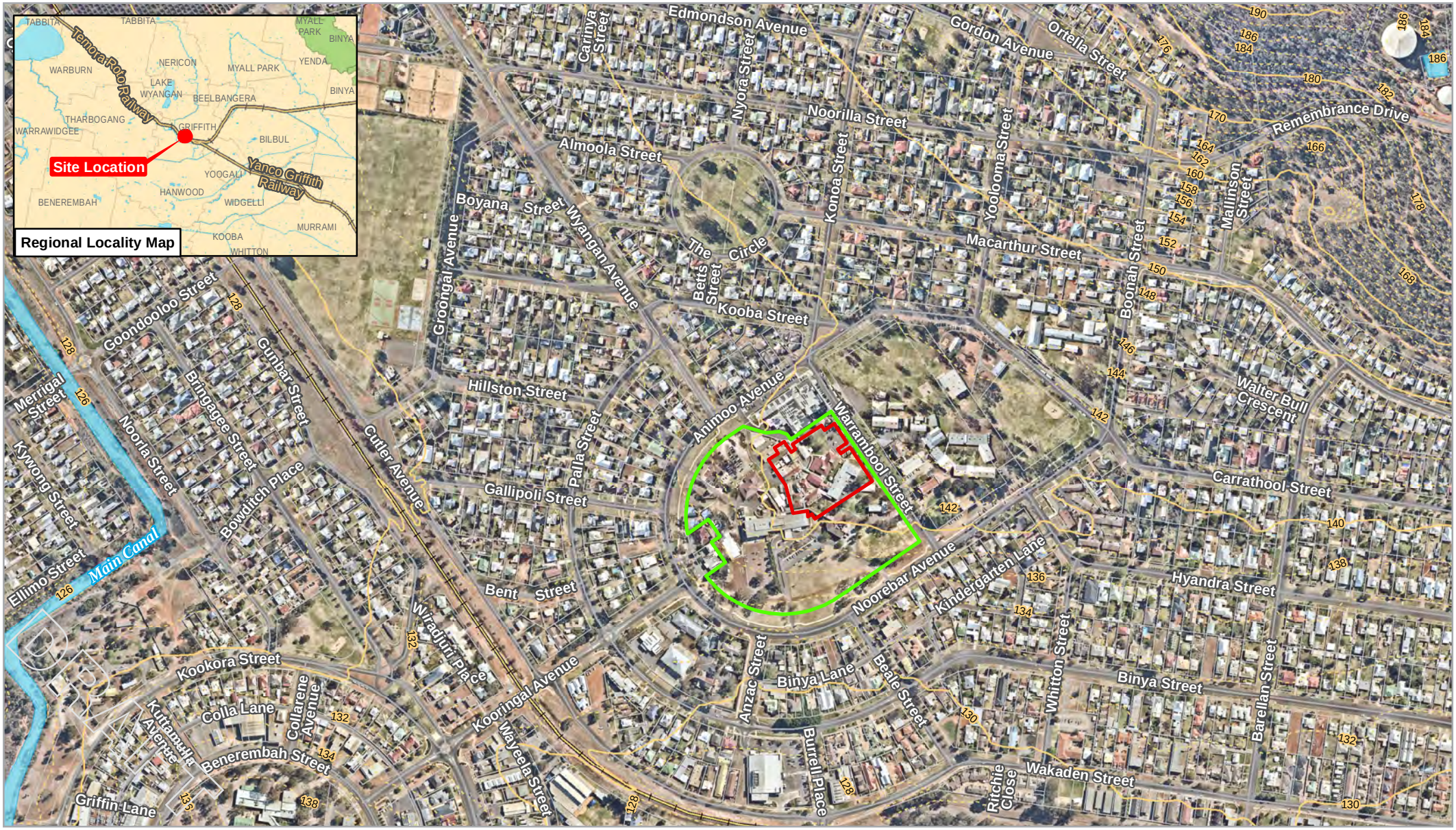
#4 Measurement based on value for p-Xylene

#5 Not limiting: Derived water HSL exceeds water solubility limit

#6 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.

#7 To obtain F2 subtract napthalene from the >C10 - C16 fraction.

GHD Stage 2 Development Area Phase 2 ESA report 2018



Legend

- Stage 1 Development Area (Approximate)
- Stage 2 Development Area
- Waterbodies
- Cadastre
- Roads
- Railways
- Contours

Paper Size ISO A4

0 50 100 150 200

Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

GHD

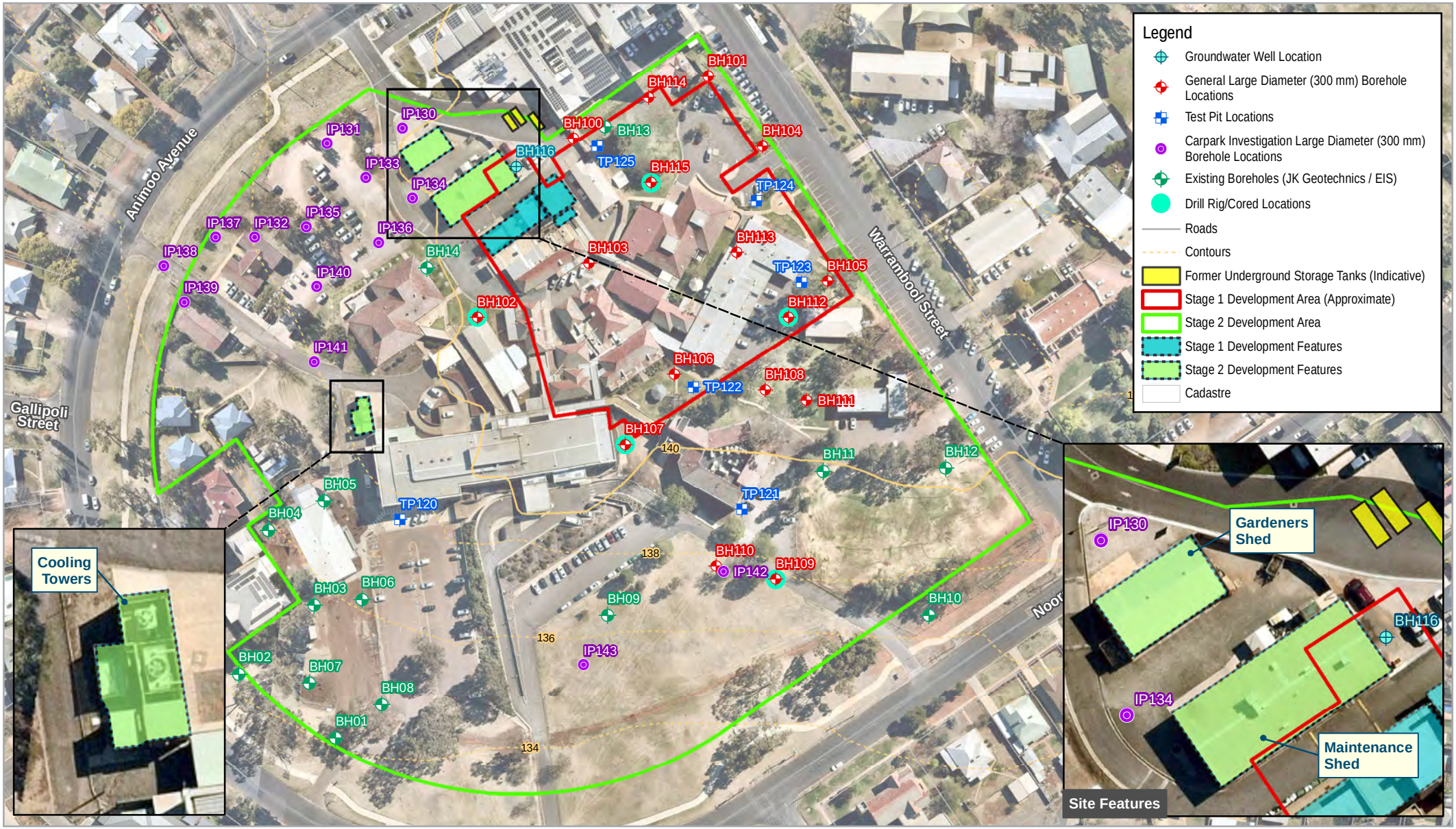
Health Infrastructure
Griffith Hospital Redevelopment
Geotechnical Investigation and Contamination Assessment

Stage 2 Development Area
Site Locality Plan

Project No. 21-27721
Revision No. A
Date 29 Nov 2018

FIGURE 1

Data source: General topo - NSW LPI DTDB 2012. Cadastre - NSW LPI DCDB 2012. Aerial imagery - Nearmap (Image date: 30 Sept 2018, Extraction date: 23 November 2018). Existing borehole locations - JK Geotechnics, 2017 (Borehole Location Plan Report No. 30991L, Fig. No. 2). Created by: kqvelasco



DRAFT

Paper Size ISO A4

0 20 40 60 80

Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

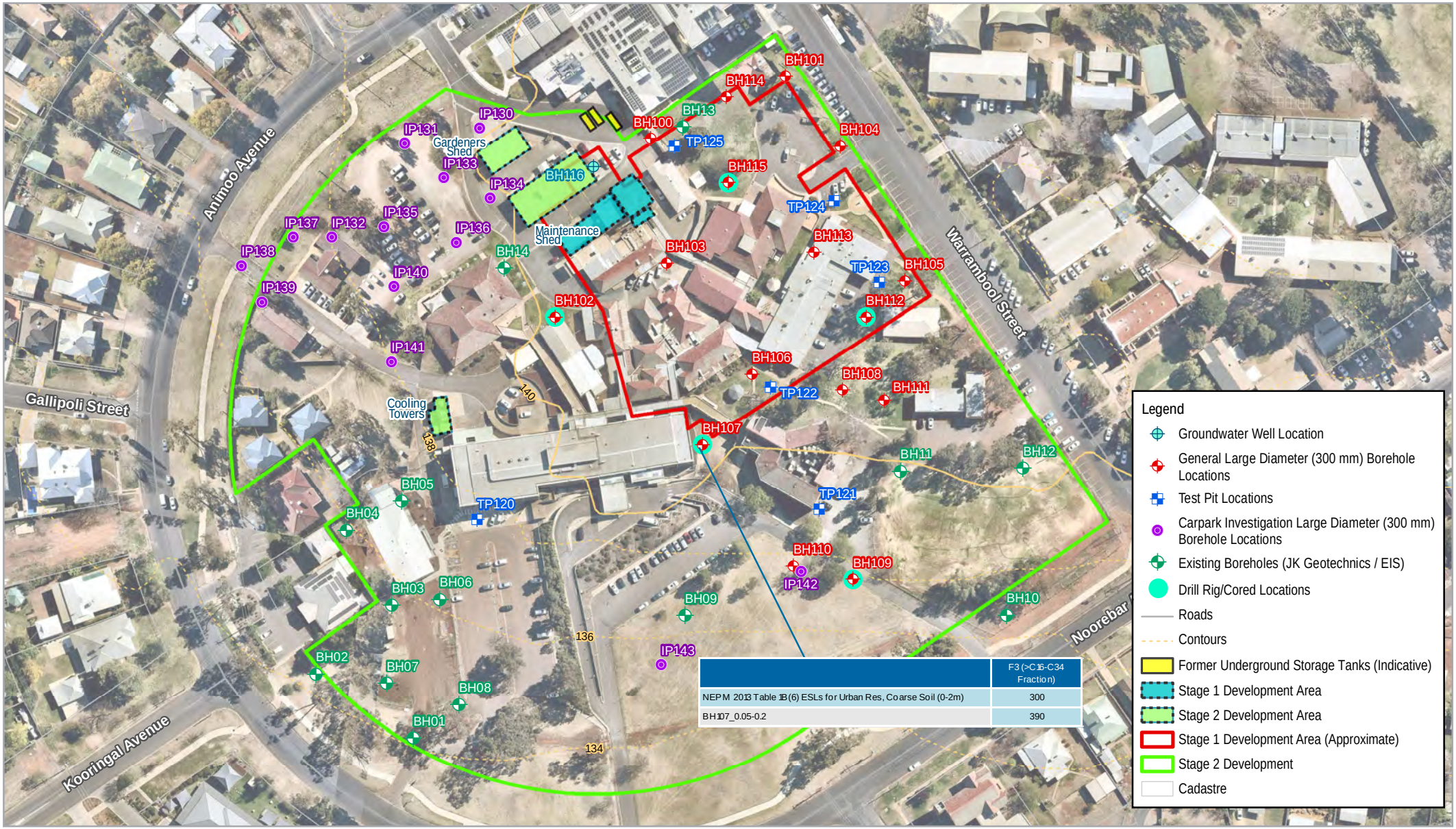
Health Infrastructure
Griffith Hospital Redevelopment
Geotechnical Investigation and Contamination Assessment

Stage 2 Development Area
Sampling Location Plan and Site Features

Project No. 21-27721
Revision No. A
Date 29 Nov 2018

FIGURE 2

Data source: General topo - NSW LPI DTDB 2012. Cadastre - NSW LPI DCDB 2012. Aerial imagery - Nearmap (Image date: 30 Sept 2018, Extraction date: 23 November 2018). Existing borehole locations - JK Geotechnics, 2017 (Borehole Location Plan Report No. 30991L, Fig. No. 2) . Created by: kqvelasco



	F3 (>C16-C34 Fraction)
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil (0-2m)	300
BH107_0.05-0.2	390

DRAFT

Paper Size ISO A4

0 20 40 60 80

Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

Health Infrastructure
Griffith Hospital Redevelopment
Geotechnical Investigation and Contamination Assessment

Project No. 21-27721
Revision No. A
Date 29 Nov 2018

Stage 2 Development Area Guideline Exceedance Locations

FIGURE 3

Data source: General topo - NSW LPI DTDB 2012. Cadastre - NSW LPI DCDB 2012. Aerial imagery - Nearmap (Image date: 30 Sept 2018, Extraction date: 23 November 2018). Existing borehole locations - JK Geotechnics, 2017 (Borehole Location Plan Report No. 30991L, Fig. No. 2). Created by: kqvelasco

Appendix D Table QA1
Quality Samples

Health Infrastructure NSW
Griffith Hospital Redevelopment
– Contamination Investigation

	Groundwater QA/QC Samples			Soil QA/QC Samples							
Lab Report Number	627174	627174	627174	626759	627011	626158	626161	626158	626161	627011	627011
Field ID	RB02_GW	TB02	TS02	BH103	RB01_SOIL	TB1	TB2	TS1	TS2	TB01	TS01
Sampled_Date/Time	8/11/2018	8/11/2018	8/11/2018	2/11/2018	8/11/2018		31/10/2018		31/10/2018	8/11/2018	8/11/2018
Sample Type	Rinsate	Trip_B	Trip_S	Rinsate	Rinsate	Trip_B	Trip_B	Trip_S	Trip_S	Trip_B	Trip_S
Matrix	Water	Water	Water	Water	Water	Water	Water	Water	Water	Soil	Soil
Method_Type	**ChemName**											
F1-BTEX	F1 (C6-C10 minus BTEX)		<20				<20	<20				
Heavy Metal	Arsenic	<0.001			<0.001	<0.001						
	Arsenic (Filtered)											
	Cadmium	<0.0002			<0.0002	<0.0002						
	Cadmium (Filtered)											
	Chromium (III+VI)	<0.001			<0.001	<0.001						
	Chromium (III+VI) (Filtered)											
	Copper	<0.001			<0.001	<0.001						
	Copper (Filtered)											
	Lead	<0.001			<0.001	<0.001						
	Lead (Filtered)											
	Mercury	<0.0001			<0.0001	<0.0001						
	Mercury (Filtered)											
	Nickel	<0.001			<0.001	<0.001						
	Nickel (Filtered)											
	Zinc	<0.005			<0.005	<0.005						
	Zinc (Filtered)											
Organic	Naphthalene (BTEXN)		<10	100*			<10	<10	78*	99*	<0.5	83*
	F1 (C6-C10 minus BTEX)										<20	
	C6-C10 Fraction		<20	77*			<20	<20	81*	72*	<20	110*
	F2 (>C10-C16 minus Naphthalene)											
	>C10-C16 Fraction											
	F3 (>C16-C34 Fraction)											
	F4 (>C34-C40 Fraction)											
	>C10-C40 (Sum of Total)											
	C6-C9 Fraction		<20	76*			<20	<20	76*	75*	<20	100*
Volatile	Benzene		<1	100*			<1	<1	110*	110*	<0.1	110*
	Toluene		<1	100*			<1	<1	94*	88*	<0.1	100*
	Ethylbenzene		<1	110*			<1	<1	94*	85*	<0.1	100*
	Xylene (o)		<1	110*			<1	<1	100*	97*	<0.1	100*
	Xylene (m & p)		<2	110*			<2	<2	98*	96*	<0.2	100*
	Xylene Total		<3	110*			<3	<3	97*	89*	<0.3	100*

* Results reported as percentage recovery.

Filter: Lab_Report_Number in('627011','627174','626734','626759','626158','626161')
\\ghdnet\ghd\AU\Sydney\Projects\21\27721\Contamination\Esdat_output\3. QA\QA2 - FieldBlankWater.xlsx

Appendix D
Table QA2
Duplicate RPD Comparison

Lab Report Number	626161	626161		626161	626161		626161	626161		627011	627011		627011	ES1833667		627011	ES1833667	
Field ID	BH108 0.7-1.0	QA3	RPD	IP133 0.4-0.6	QA2	RPD	IP136 0.4-0.6	QA1	RPD	TP124 0.0 0.1	QA01	RPD	TP124 0.0 0.1	QA02	RPD	TP122 0.0 0.1	QA04	RPD
Sampled Date/Time	1/11/2018	1/11/2018		31/10/2018	31/10/2018		31/10/2018	31/10/2018		8/11/2018	8/11/2018		8/11/2018	8/11/2018		8/11/2018	8/11/2018	

Method_Type	ChemName	Units	EQL																	
Inorganic	Moisture Content (dried @ 103°C)	%	1	8.2	7	16	3.1	2.9	7	11	12	9	13	13	0	13					
Heavy Metal	Arsenic	mg/kg	2 : 5 (Interlab)	3	2.7	11	2.6	2.7	4	3.3	3.8	14	2.5	2.7	8	2.5	<5	0	2.1	<5	0
	Cadmium	mg/kg	0.4 : 1 (Interlab)	<0.4	<0.4	0	<0.4	<0.4	0	<0.4	<0.4	0	<0.4	<0.4	0	<0.4	<1	0	<0.4	<1	0
	Chromium (III+VI)	mg/kg	5 : 2 (Interlab)	23	23	0	19	19	0	33	33	0	**27**	**37**	**31**	**27**	**19**	**35**	16	13	21
	Copper	mg/kg	5	8.7	7.8	11	7.6	7.5	1	11	12	9	11	15	31	11	9	20	7	6	15
	Lead	mg/kg	5	9.7	10	3	14	14	0	9.1	9.5	4	**14**	**75**	**137**	14	18	25	6.9	6	14
	Mercury	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0
	Nickel	mg/kg	5 : 2 (Interlab)	13	9.6	30	8.5	8	6	22	24	9	**26**	**47**	**58**	**26**	**19**	**31**	5.7	4	35
	Zinc	mg/kg	5	20	22	10	31	27	14	21	22	5	41	52	24	41	41	0	26	21	21
Organic	Naphthalene (BTEXN)	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5					
Volatile	Benzene	mg/kg	0.1 : 0.2 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.2	0	<0.1	<0.2	0
	Toluene	mg/kg	0.1 : 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.5	0
	Ethylbenzene	mg/kg	0.1 : 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.5	0
	Xylene (o)	mg/kg	0.1 : 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.5	0
	Xylene (m & p)	mg/kg	0.2 : 0.5 (Interlab)	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.5	0	<0.2	<0.5	0
	Xylene Total	mg/kg	0.3 : 0.5 (Interlab)	<0.3	<0.3	0	<0.3	<0.3	0	<0.3	<0.3	0	<0.3	<0.3	0	<0.3	<0.5	0	<0.3	<0.5	0
Organic	F1 (C6-C10 minus BTEX)	mg/kg	20 : 10 (Interlab)	<20	<20	0	<20	<20	0	<20	<20	0	<20	<20	0	<20	<10	0	<20	<10	0
	C6-C10 Fraction	mg/kg	20 : 10 (Interlab)	<20	<20	0	<20	<20	0	<20	<20	0	<20	<20	0	<20	<10	0	<20	<10	0
	F2 (>C10-C16 minus Naphthalene)	mg/kg	50	<50	<50	0	<50	<50	0	<50	<50	0	<50	<50	0	<50	<50	0	<50	<50	0
	>C10-C16 Fraction	mg/kg	50	<50	<50	0	<50	<50	0	<50	<50	0	<50	<50	0	<50	<50	0	<50	<50	0
	F3 (>C16-C34 Fraction)	mg/kg	100	<100	<100	0	<100	<100	0	<100	<100	0	120	110	9	120	<100	18	<100	<100	0
	F4 (>C34-C40 Fraction)	mg/kg	100	<100	<100	0	<100	<100	0	<100	<100	0	<100	<100	0	<100	<100	0	<100	<100	0
	>C10-C40 (Sum of Total)	mg/kg	100 : 50 (Interlab)	<100	<100	0	<100	<100	0	<100	<100	0	120	110	9	120	<50	82	<100	<50	0
	C6-C9 Fraction	mg/kg	20 : 10 (Interlab)	<20	<20	0	<20	<20	0	<20	<20	0	<20	<20	0	<20	<10	0	<20	<10	0
TPH	C10-C14 Fraction	mg/kg	20 : 50 (Interlab)	<20	<20	0	<20	<20	0	<20	<20	0	<20	<20	0	<20	<50	0	<20	<50	0
	C15-C28 Fraction	mg/kg	50 : 100 (Interlab)	<50	<50	0	<50	<50	0	<50	<50	0	77	72	7	77	<100	0	<50	<100	0
	C29-C36 Fraction	mg/kg	50 : 100 (Interlab)	<50	<50	0	<50	<50	0	<50	<50	0	66	57	15	66	<100	0	<50	<100	0
	C10-C36 (Sum of Total)	mg/kg	50	<50	<50	0	<50	<50	0	<50	<50	0	143	129	10	143	<50	96	<50	<50	0
PAH	Acenaphthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Acenaphthylene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Benz(a)anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Benzo(a) pyrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Benzo[b+j]fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Benzo(k)fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Benzo(g,h,i)perylene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Chrysene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Dibenz(a,h)anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Fluorene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Naphthalene-PAH	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5					
	Phenanthrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Pyrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	PAHs (Sum of total) - Lab calc	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Total 8 PAHs (as BaP TEQ)(zero LOR) - Lab Calc	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Total 8 PAHs (as BaP TEQ)(half LOR) - Lab Calc	mg/kg	0.5	0.6	0.6	0	0.6	0.6	0	0.6	0.6	0	0.6	0.6	0	0.6	0.6	0	0.6	0.6	0
	Total 8 PAHs (as BaP TEQ)(full LOR) - Lab Calc	mg/kg	0.5	1.2	1.2	0	1.2	1.2	0	1.2	1.2	0	1.2	1.2	0	1.2	1.2	0	1.2	1.2	0

*RPDs have only been considered where a concentration is greater than 10 times the EQL.
**GHD adopts a nominal acceptance criterion of < 50% RPD for field duplicates and splits for organics and an acceptance criterion of < 30% RPD for inorganics.
***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

	Inorganics			Particle Size Analysis	Exchangeable cations	TOC	Asbestos			
	Electrical conductivity (lab)	Moisture Content (dried @ 103°C)	pH (aqueous extract)	Clay (<2 µm)	CEC	Total Organic Carbon	Organic Fibres - Comment	Respirable Fibres - Comment	Asbestos from ACM in Soil	Asbestos from FA & AF in Soil
	µS/cm	%	pH Units	%	meq/100g	%	Comment	Comment	%w/w	%w/w
EQL	10	1	0.1	1	0.05	0.1				
NEPM 2013 Table 1A(1) HIL B Res										
NEPM 2013 Table 1A(1) HIL C Rec										
NEPM 2013 Table 1A(3) HSL A/B Res Soil for Vapour Intrusion, Sand 0-1m										
NEPM 2013 Table 7 HSL C Rec Asbestos contamination in soil									0.02	0.001[#11]
Location Code	**Depth**	**Date**	**Field ID**	**Sample Type**	**Matrix Type**	**Lab Report Number**									
BH100	0.05 - 0.15	2/11/2018	BH100 0.05-0.15M	Normal	soil	626734	-	10	-	-	-	-	Organic fibres detected.	No respirable fibres detected.	-	-
BH100	0.4 - 0.6	2/11/2018	BH100 0.4-0.6M	Normal	soil	626734	-	7.2	-	-	-	-	-	-	-	-
BH102	0.4 - 0.5	31/10/2018	BH102_0.4-0.5	Normal	soil	626161	-	9.9	-	-	-	-	Organic fibres detected.	No respirable fibres detected.	-	-
BH102	0.9 - 1	31/10/2018	BH102_0.9-1.0	Normal	soil	626161	-	13	-	-	-	-	-	-	-	-
BH107	0.05 - 0.2	30/10/2018	BH107_0.05-0.2	Normal	soil	626161	-	13	-	-	-	-	Organic fibres detected.	No respirable fibres detected.	-	-
BH107	1.7 - 2	30/10/2018	BH107_1.7-2.0	Normal	soil	626161	190	24	9.0	12	43	0.3	-	-	-	-
BH108	0.05 - 0.2	1/11/2018	BH108_0.05-0.2	Normal	soil	626161	-	7.6	-	-	-	-	Organic fibres detected.	No respirable fibres detected.	-	-
BH108	0.7 - 1	1/11/2018	BH108_0.7-1.0	Normal	soil	626161	-	8.2	-	-	-	-	-	-	-	-
BH108	0.7 - 1	1/11/2018	QA3	Field_D	soil	626161	-	7.0	-	-	-	-	-	-	-	-
BH109	0.05 - 0.2	30/10/2018	BH109_0.05-0.2	Normal	soil	626161	-	24	-	-	-	-	Organic fibres detected.	No respirable fibres detected.	-	-
BH109	1.6 - 1.9	30/10/2018	BH109_1.6-1.9	Normal	soil	626161	-	8.3	-	-	-	-	-	-	-	-
BH110	0.05 - 0.2	1/11/2018	BH110_0.05-0.2	Normal	soil	626161	-	14	-	-	-	-	Organic fibres detected.	No respirable fibres detected.	-	-
BH111	0.1 - 0.2	1/11/2018	BH111_0.1-0.2	Normal	soil	626161	-	-	-	-	-	-	Organic fibres detected.	No respirable fibres detected.	-	-
IP130	0.1 - 0.2	31/10/2018	IP130_0.1-0.2	Normal	soil	626161	-	-	-	-	-	-	Organic fibres detected.	No respirable fibres detected.	-	-
IP133	0.4 - 0.6	31/10/2018	IP133_0.4-0.6	Normal	soil	626161	-	3.1	-	-	-	-	-	-	-	-
IP133	0.4 - 0.6	31/10/2018	QA2	Field_D	soil	626161	-	2.9	-	-	-	-	-	-	-	-
IP136	0.4 - 0.6	31/10/2018	IP136_0.4-0.6	Normal	soil	626161	-	11	-	-	-	-	-	-	-	-
IP136	0.4 - 0.7	31/10/2018	QA1	Field_D	soil	626161	-	12	-	-	-	-	-	-	-	-
IP137	0.05 - 0.2	31/10/2018	IP137_0.05-0.2	Normal	soil	626161	-	6.1	-	-	-	-	-	-	-	-
IP138	0.05 - 0.2	31/10/2018	IP138_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	Organic fibres detected.	No respirable fibres detected.	-	-
IP140	0.4 - 0.6	31/10/2018	IP140_0.4-0.6	Normal	soil	626161	-	5.1	-	-	-	-	-	-	-	-
IP143	0.05 - 0.1	31/10/2018	IP143_0.05-0.1	Normal	soil	626161	-	8.9	-	-	-	-	Organic fibres detected.	No respirable fibres detected.	-	-
TP120	0.2 - 0.3	3/11/2018	TP120 0.2-0.3M	Normal	soil	626734	-	13	-	-	-	-	Organic fibres detected.	No respirable fibres detected.	-	-
TP121	0.4 - 0.6	2/11/2018	TP121 0.4-0.6M	Normal	soil	626734	-	10.0	-	-	-	-	-	-	-	-

Comments

#1 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe important and should be considered where appropriate (refer Shedule B7).

#2 In the absence of a guideline value for total chromium, chromium VI value adopted

#3 Lead: HILs A,B,C based on blood lead models (IEUBK & HIL D on adult lead model for where 50% bioavailability considered. Site-specific bioavailability should be considered where appropriate.

#4 Elemental mercury: HIL does not address elemental mercury. a site specific assessment should be considered if elemental mercury is present, or suspected to be present.

#5 Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application should consider presence of carcinogenic PAHs (should meet BaP TEQ HIL) & napthalene (should meet relevant HSL)

#6 Carcinogenic PAHs: HIL based on 8 carc. PAHs & their TEFs (rel to BaP ref Schedule 7) BaP TEQ calc by multiplying the conc of each carc. PAH in sample by its BaP TEF (ref Table 1A(1)) & summing

#7 PCBs: HIL refers to non-dioxin like PCBs only. Where PCB source is known, or suspected at a site, a site-specific assessment of exposure to all PCBs (inc dioxin like PCBs) should be undertaken

#8 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.

#9 To obtain F2 subtract napthalene from the >C10 - C16 fraction.

#10 Not limiting: Derived soil HSL exceeds soil saturation concentration

#11 Only applies where the FA & AF are able to be quantified by gravimetric procedures. Not applicable to free fibres.

#12 Nil

		Metals								BTEXN			
	Asbestos Reported Result	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc	Benzene	Toluene	Ethylbenzene	Xylene (o)
	Comment	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		2	0.4	5	5	5	0.1	5	5	0.1	0.1	0.1	0.1
NEPM 2013 Table 1A(1) HIL B Res		500[#1]	150	500[#2]	30,000	1,200[#3]	120[#4]	1,200	60,000				
NEPM 2013 Table 1A(1) HIL C Rec		300[#1]	90	300[#2]	17,000	600[#3]	80[#4]	1,200	30,000				
NEPM 2013 Table 1A(3) HSL A/B Res Soil for Vapour Intrusion, Sand													
0-1m										0.5	160	55	
NEPM 2013 Table 7 HSL C Rec Asbestos contamination in soil													
Location Code	**Depth**	**Date**	**Field ID**	**Sample Type**	**Matrix Type**	**Lab Report Number**							
BH100	0.05 - 0.15	2/11/2018	BH100 0.05-0.15M	Normal	soil	626734	No asbestos detected at the reporting limit of 0.01% w/w.	2.6	<0.4	130	40	10	<0.1	190	78	<0.1	<0.1	<0.1	<0.1
BH100	0.4 - 0.6	2/11/2018	BH100 0.4-0.6M	Normal	soil	626734	-	2.6	<0.4	27	7.4	6.5	<0.1	16	18	<0.1	<0.1	<0.1	<0.1
BH102	0.4 - 0.5	31/10/2018	BH102_0.4-0.5	Normal	soil	626161	No asbestos detected at the reporting limit of 0.01% w/w.	2.4	<0.4	25	11	13	<0.1	15	53	<0.1	<0.1	<0.1	<0.1
BH102	0.9 - 1	31/10/2018	BH102_0.9-1.0	Normal	soil	626161	-	2.7	<0.4	22	8.5	8.7	<0.1	12	23	<0.1	<0.1	<0.1	<0.1
BH107	0.05 - 0.2	30/10/2018	BH107_0.05-0.2	Normal	soil	626161	No asbestos detected at the reporting limit of 0.01% w/w.	2.6	<0.4	19	9.0	10	<0.1	11	32	<0.1	<0.1	<0.1	<0.1
BH107	1.7 - 2	30/10/2018	BH107_1.7-2.0	Normal	soil	626161	-	2.6	<0.4	19	9.2	9.9	<0.1	13	20	<0.1	<0.1	<0.1	<0.1
BH108	0.05 - 0.2	1/11/2018	BH108_0.05-0.2	Normal	soil	626161	No asbestos detected at the reporting limit of 0.01% w/w.	-	-	-	-	-	-	-	-	-	-	-	-
BH108	0.7 - 1	1/11/2018	BH108_0.7-1.0	Normal	soil	626161	-	3.0	<0.4	23	8.7	9.7	<0.1	13	20	<0.1	<0.1	<0.1	<0.1
BH108	0.7 - 1	1/11/2018	QA3	Field_D	soil	626161	-	2.7	<0.4	23	7.8	10	<0.1	9.6	22	<0.1	<0.1	<0.1	<0.1
BH109	0.05 - 0.2	30/10/2018	BH109_0.05-0.2	Normal	soil	626161	No asbestos detected at the reporting limit of 0.01% w/w.	-	-	-	-	-	-	-	-	-	-	-	-
BH109	1.6 - 1.9	30/10/2018	BH109_1.6-1.9	Normal	soil	626161	-	2.9	<0.4	12	<5	12	<0.1	8.6	7.7	<0.1	<0.1	<0.1	<0.1
BH110	0.05 - 0.2	1/11/2018	BH110_0.05-0.2	Normal	soil	626161	No asbestos detected at the reporting limit of 0.01% w/w.	3.3	<0.4	24	7.3	8.2	<0.1	9.2	17	<0.1	<0.1	<0.1	<0.1
BH111	0.1 - 0.2	1/11/2018	BH111_0.1-0.2	Normal	soil	626161	No asbestos detected at the reporting limit of 0.01% w/w.	-	-	-	-	-	-	-	-	-	-	-	-
IP130	0.1 - 0.2	31/10/2018	IP130_0.1-0.2	Normal	soil	626161	No asbestos detected at the reporting limit of 0.01% w/w.	-	-	-	-	-	-	-	-	-	-	-	-
IP133	0.4 - 0.6	31/10/2018	IP133_0.4-0.6	Normal	soil	626161	-	2.6	<0.4	19	7.6	14	<0.1	8.5	31	<0.1	<0.1	<0.1	<0.1
IP133	0.4 - 0.6	31/10/2018	QA2	Field_D	soil	626161	-	2.7	<0.4	19	7.5	14	<0.1	8.0	27	<0.1	<0.1	<0.1	<0.1
IP136	0.4 - 0.6	31/10/2018	IP136_0.4-0.6	Normal	soil	626161	-	3.3	<0.4	33	11	9.1	<0.1	22	21	<0.1	<0.1	<0.1	<0.1
IP136	0.4 - 0.7	31/10/2018	QA1	Field_D	soil	626161	-	3.8	<0.4	33	12	9.5	<0.1	24	22	<0.1	<0.1	<0.1	<0.1
IP137	0.05 - 0.2	31/10/2018	IP137_0.05-0.2	Normal	soil	626161	-	2.7	<0.4	24	8.1	10	<0.1	9.4	24	<0.1	<0.1	<0.1	<0.1
IP138	0.05 - 0.2	31/10/2018	IP138_0.05-0.2	Normal	soil	626161	No asbestos detected at the reporting limit of 0.01% w/w.	-	-	-	-	-	-	-	-	-	-	-	-
IP140	0.4 - 0.6	31/10/2018	IP140_0.4-0.6	Normal	soil	626161	-	2.3	<0.4	24	7.1	6.6	<0.1	12	15	<0.1	<0.1	<0.1	<0.1
IP143	0.05 - 0.1	31/10/2018	IP143_0.05-0.1	Normal	soil	626161	No asbestos detected at the reporting limit of 0.01% w/w.	<2	<0.4	16	<5	6.5	<0.1	<5	14	<0.1	<0.1	<0.1	<0.1
TP120	0.2 - 0.3	3/11/2018	TP120 0.2-0.3M	Normal	soil	626734	No asbestos detected at the reporting limit of 0.01% w/w.	5.6	<0.4	81	27	8.5	<0.1	100	52	<0.1	<0.1	<0.1	<0.1
TP121	0.4 - 0.6	2/11/2018	TP121 0.4-0.6M	Normal	soil	626734	-	2.6	<0.4	69	24	6.8	<0.1	84	43	<0.1	<0.1	<0.1	<0.1

Comments

#1 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe important and should be considered where
#2 In the absence of a guideline value for total chromium, chromium VI value adopted
#3 Lead: HILs A,B,C based on blood lead models (IEUBK & HIL D on adult lead model for where 50% bioavailability considered
#4 Elemental mercury: HIL does not address elemental mercury. a site specific assessment should be considered if elemental r
#5 Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application should consider presence of carcinogen
#6 Carcinogenic PAHs: HIL based on 8 carc. PAHs & their TEFs (rel to BaP ref Schedule 7) BaP TEQ calc by multiplying the c
#7 PCBs: HIL refers to non-dioxin like PCBs only. Where PCB source is known, or suspected at a site, a site-specific assessme
#8 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#9 To obtain F2 subtract napthalene from the >C10 - C16 fraction.
#10 Not limiting: Derived soil HSL exceeds soil saturation concentration
#11 Only applies where the FA & AF are able to be quantified by gravimetric procedures. Not applicable to free fibres.
#12 Nil

									TRH - NEPM 2013							TRH - NEPM 1999						
									Xylene (m & p)	Xylene Total	Naphthalene (BTEXN)	F1 (C6-C10 minus BTEX)	C6-C10 Fraction	F2 (>C10-C16 minus Naphthalene)	>C10-C16 Fraction	F3 (>C16-C34 Fraction)	F4 (>C34-C40 Fraction)	>C10-C40 (Sum of Total)	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 (Sum of Total)	Acenaphthene	Acenaphthylene
									mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL									0.2	0.3	0.5	20	20	50	50	100	100	100	20	20	50	50	50	0.5	0.5
NEPM 2013 Table 1A(1) HIL B Res																									
NEPM 2013 Table 1A(1) HIL C Rec																									
NEPM 2013 Table 1A(3) HSL A/B Res Soil for Vapour Intrusion, Sand																									
0-1m										40	3	45[#8]		110[#9]											
NEPM 2013 Table 7 HSL C Rec Asbestos contamination in soil																									
Location Code	**Depth**	**Date**	**Field ID**	**Sample Type**	**Matrix Type**	**Lab Report Number**																			
BH100	0.05 - 0.15	2/11/2018	BH100 0.05-0.15M	Normal	soil	626734	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5
BH100	0.4 - 0.6	2/11/2018	BH100 0.4-0.6M	Normal	soil	626734	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5
BH102	0.4 - 0.5	31/10/2018	BH102_0.4-0.5	Normal	soil	626161	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5
BH102	0.9 - 1	31/10/2018	BH102_0.9-1.0	Normal	soil	626161	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5
BH107	0.05 - 0.2	30/10/2018	BH107_0.05-0.2	Normal	soil	626161	<0.2	<0.3	<0.5	<20	<20	<50	<50	390	<100	390	<20	<20	280	120	400	<0.5	<0.5
BH107	1.7 - 2	30/10/2018	BH107_1.7-2.0	Normal	soil	626161	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5
BH108	0.05 - 0.2	1/11/2018	BH108_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH108	0.7 - 1	1/11/2018	BH108_0.7-1.0	Normal	soil	626161	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5
BH108	0.7 - 1	1/11/2018	QA3	Field_D	soil	626161	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5
BH109	0.05 - 0.2	30/10/2018	BH109_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH109	1.6 - 1.9	30/10/2018	BH109_1.6-1.9	Normal	soil	626161	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5
BH110	0.05 - 0.2	1/11/2018	BH110_0.05-0.2	Normal	soil	626161	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5
BH111	0.1 - 0.2	1/11/2018	BH111_0.1-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP130	0.1 - 0.2	31/10/2018	IP130_0.1-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP133	0.4 - 0.6	31/10/2018	IP133_0.4-0.6	Normal	soil	626161	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5
IP133	0.4 - 0.6	31/10/2018	QA2	Field_D	soil	626161	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5
IP136	0.4 - 0.6	31/10/2018	IP136_0.4-0.6	Normal	soil	626161	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5
IP136	0.4 - 0.7	31/10/2018	QA1	Field_D	soil	626161	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5
IP137	0.05 - 0.2	31/10/2018	IP137_0.05-0.2	Normal	soil	626161	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5
IP138	0.05 - 0.2	31/10/2018	IP138_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP140	0.4 - 0.6	31/10/2018	IP140_0.4-0.6	Normal	soil	626161	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5
IP143	0.05 - 0.1	31/10/2018	IP143_0.05-0.1	Normal	soil	626161	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5
TP120	0.2 - 0.3	3/11/2018	TP120 0.2-0.3M	Normal	soil	626734	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5
TP121	0.4 - 0.6	2/11/2018	TP121 0.4-0.6M	Normal	soil	626734	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5

Comments

#1 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe important and should be considered where
#2 In the absence of a guideline value for total chromium, chromium VI value adopted
#3 Lead: HILs A,B,C based on blood lead models (IEUBK & HIL D on adult lead model for where 50% bioavailability considered
#4 Elemental mercury: HIL does not address elemental mercury. a site specific assessment should be considered if elemental r
#5 Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application should consider presence of carcinogen
#6 Carcinogenic PAHs: HIL based on 8 carc. PAHs & their TEFs (rel to BaP ref Schedule 7) BaP TEQ calc by multiplying the c
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#8 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#9 To obtain F2 subtract napthalene from the >C10 - C16 fraction.
#10 Not limiting: Derived soil HSL exceeds soil saturation concentration
#11 Only applies where the FA & AF are able to be quantified by gravimetric procedures. Not applicable to free fibres.
#12 Nil

								PAHs													
								Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo[b+j]fluoranthene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene-PAH	Phenanthrene	Pyrene	PAHs (Sum of total) - Lab calc	Total 8 PAHs (as BaP TEQ)(zero LOR) - Lab Calc	Total 8 PAHs (as BaP TEQ)(half LOR) - Lab Calc
								mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL								0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
NEPM 2013 Table 1A(1) HIL B Res																						400[#5]	4[#6]	4[#6]
NEPM 2013 Table 1A(1) HIL C Rec																						300[#5]	3[#6]	3[#6]
NEPM 2013 Table 1A(3) HSL A/B Res Soil for Vapour Intrusion, Sand																								
0-1m																			3					
NEPM 2013 Table 7 HSL C Rec Asbestos contamination in soil																								
Location Code	**Depth**	**Date**	**Field ID**	**Sample Type**	**Matrix Type**	**Lab Report Number**																		
BH100	0.05 - 0.15	2/11/2018	BH100 0.05-0.15M	Normal	soil	626734	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6
BH100	0.4 - 0.6	2/11/2018	BH100 0.4-0.6M	Normal	soil	626734	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6
BH102	0.4 - 0.5	31/10/2018	BH102_0.4-0.5	Normal	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6
BH102	0.9 - 1	31/10/2018	BH102_0.9-1.0	Normal	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6
BH107	0.05 - 0.2	30/10/2018	BH107_0.05-0.2	Normal	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6
BH107	1.7 - 2	30/10/2018	BH107_1.7-2.0	Normal	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6
BH108	0.05 - 0.2	1/11/2018	BH108_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH108	0.7 - 1	1/11/2018	BH108_0.7-1.0	Normal	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6
BH108	0.7 - 1	1/11/2018	QA3	Field_D	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6
BH109	0.05 - 0.2	30/10/2018	BH109_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH109	1.6 - 1.9	30/10/2018	BH109_1.6-1.9	Normal	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6
BH110	0.05 - 0.2	1/11/2018	BH110_0.05-0.2	Normal	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6
BH111	0.1 - 0.2	1/11/2018	BH111_0.1-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP130	0.1 - 0.2	31/10/2018	IP130_0.1-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP133	0.4 - 0.6	31/10/2018	IP133_0.4-0.6	Normal	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6
IP133	0.4 - 0.6	31/10/2018	QA2	Field_D	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6
IP136	0.4 - 0.6	31/10/2018	IP136_0.4-0.6	Normal	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6
IP136	0.4 - 0.7	31/10/2018	QA1	Field_D	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6
IP137	0.05 - 0.2	31/10/2018	IP137_0.05-0.2	Normal	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6
IP138	0.05 - 0.2	31/10/2018	IP138_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP140	0.4 - 0.6	31/10/2018	IP140_0.4-0.6	Normal	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6
IP143	0.05 - 0.1	31/10/2018	IP143_0.05-0.1	Normal	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6
TP120	0.2 - 0.3	3/11/2018	TP120 0.2-0.3M	Normal	soil	626734	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6
TP121	0.4 - 0.6	2/11/2018	TP121 0.4-0.6M	Normal	soil	626734	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6

Comments

#1 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe important and should be considered where
#2 In the absence of a guideline value for total chromium, chromium VI value adopted
#3 Lead: HILs A,B,C based on blood lead models (IEUBK & HIL D on adult lead model for where 50% bioavailability considered
#4 Elemental mercury: HIL does not address elemental mercury. a site specific assessment should be considered if elemental r
#5 Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application should consider presence of carcinogen
#6 Carcinogenic PAHs: HIL based on 8 carc. PAHs & their TEFs (rel to BaP ref Schedule 7) BaP TEQ calc by multiplying the c
#7 PCBs: HIL refers to non-dioxin like PCBs only. Where PCB source is known, or suspected at a site, a site-specific assessme
#8 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#9 To obtain F2 subtract napthalene from the >C10 - C16 fraction.
#10 Not limiting: Derived soil HSL exceeds soil saturation concentration
#11 Only applies where the FA & AF are able to be quantified by gravimetric procedures. Not applicable to free fibres.
#12 Nil

		OC Pesticides																
	Total 8 PAHs (as BaP TEQ)(full LOR) - Lab Calc	Organochlorine pesticides EPAV/c	Other organochlorine pesticides EPAV/c	4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane	d-BHC	4,4 DDD	4,4 DDT	DDT+DDE+DDD - Lab Calc	Dieldrin	Endosulfan I (alpha)	Endosulfan II (beta)	Endosulfan Sulfate
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.5	0.1	0.1	0.05	0.05	0.05	0.05	0.05	0.1	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
NEPM 2013 Table 1A(1) HIL B Res	4[#6]						10		90				600				
NEPM 2013 Table 1A(1) HIL C Rec	3[#6]						10		70				400				
NEPM 2013 Table 1A(3) HSL A/B Res Soil for Vapour Intrusion, Sand 0-1m																	
NEPM 2013 Table 7 HSL C Rec Asbestos contamination in soil																	
Location Code	**Depth**	**Date**	**Field ID**	**Sample Type**	**Matrix Type**	**Lab Report Number**														
BH100	0.05 - 0.15	2/11/2018	BH100 0.05-0.15M	Normal	soil	626734	1.2	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BH100	0.4 - 0.6	2/11/2018	BH100 0.4-0.6M	Normal	soil	626734	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH102	0.4 - 0.5	31/10/2018	BH102_0.4-0.5	Normal	soil	626161	1.2	<0.1	<0.1	<0.05	<0.05	<0.05	0.08	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	0.08	<0.05	<0.05	<0.05
BH102	0.9 - 1	31/10/2018	BH102_0.9-1.0	Normal	soil	626161	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH107	0.05 - 0.2	30/10/2018	BH107_0.05-0.2	Normal	soil	626161	1.2	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BH107	1.7 - 2	30/10/2018	BH107_1.7-2.0	Normal	soil	626161	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH108	0.05 - 0.2	1/11/2018	BH108_0.05-0.2	Normal	soil	626161	-	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BH108	0.7 - 1	1/11/2018	BH108_0.7-1.0	Normal	soil	626161	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH108	0.7 - 1	1/11/2018	QA3	Field_D	soil	626161	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH109	0.05 - 0.2	30/10/2018	BH109_0.05-0.2	Normal	soil	626161	-	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BH109	1.6 - 1.9	30/10/2018	BH109_1.6-1.9	Normal	soil	626161	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH110	0.05 - 0.2	1/11/2018	BH110_0.05-0.2	Normal	soil	626161	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH111	0.1 - 0.2	1/11/2018	BH111_0.1-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP130	0.1 - 0.2	31/10/2018	IP130_0.1-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP133	0.4 - 0.6	31/10/2018	IP133_0.4-0.6	Normal	soil	626161	1.2	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
IP133	0.4 - 0.6	31/10/2018	QA2	Field_D	soil	626161	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP136	0.4 - 0.6	31/10/2018	IP136_0.4-0.6	Normal	soil	626161	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP136	0.4 - 0.7	31/10/2018	QA1	Field_D	soil	626161	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP137	0.05 - 0.2	31/10/2018	IP137_0.05-0.2	Normal	soil	626161	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP138	0.05 - 0.2	31/10/2018	IP138_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP140	0.4 - 0.6	31/10/2018	IP140_0.4-0.6	Normal	soil	626161	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP143	0.05 - 0.1	31/10/2018	IP143_0.05-0.1	Normal	soil	626161	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP120	0.2 - 0.3	3/11/2018	TP120 0.2-0.3M	Normal	soil	626734	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP121	0.4 - 0.6	2/11/2018	TP121 0.4-0.6M	Normal	soil	626734	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Comments

#1 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe important and should be considered where
#2 In the absence of a guideline value for total chromium, chromium VI value adopted
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#8 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#9 To obtain F2 subtract napthalene from the >C10 - C16 fraction.
#10 Not limiting: Derived soil HSL exceeds soil saturation concentration
#11 Only applies where the FA & AF are able to be quantified by gravimetric procedures. Not applicable to free fibres.
#12 Nil

	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor	Toxaphene	Tokuthion	Azinphos methyl	Bolstar (Sulprofos)	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Coumaphos	Demeton-O
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	1	0.2	0.2	0.2	0.2	0.2	0.2	2	0.2
NEPM 2013 Table 1A(1) HIL B Res	20				10		15	500	30					340			
NEPM 2013 Table 1A(1) HIL C Rec	20				10		10	400	30					250			
NEPM 2013 Table 1A(3) HSL A/B Res Soil for Vapour Intrusion, Sand 0-1m																	
NEPM 2013 Table 7 HSL C Rec Asbestos contamination in soil																	
Location Code **Depth** **Date** **Field ID** **Sample Type** **Matrix Type** **Lab Report Number**																	
BH100 0.05 - 0.15 2/11/2018 BH100 0.05-0.15M Normal soil 626734	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
BH100 0.4 - 0.6 2/11/2018 BH100 0.4-0.6M Normal soil 626734	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH102 0.4 - 0.5 31/10/2018 BH102_0.4-0.5 Normal soil 626161	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
BH102 0.9 - 1 31/10/2018 BH102_0.9-1.0 Normal soil 626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH107 0.05 - 0.2 30/10/2018 BH107_0.05-0.2 Normal soil 626161	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
BH107 1.7 - 2 30/10/2018 BH107_1.7-2.0 Normal soil 626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH108 0.05 - 0.2 1/11/2018 BH108_0.05-0.2 Normal soil 626161	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
BH108 0.7 - 1 1/11/2018 BH108_0.7-1.0 Normal soil 626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH108 0.7 - 1 1/11/2018 QA3 Field_D soil 626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH109 0.05 - 0.2 30/10/2018 BH109_0.05-0.2 Normal soil 626161	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
BH109 1.6 - 1.9 30/10/2018 BH109_1.6-1.9 Normal soil 626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH110 0.05 - 0.2 1/11/2018 BH110_0.05-0.2 Normal soil 626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH111 0.1 - 0.2 1/11/2018 BH111_0.1-0.2 Normal soil 626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP130 0.1 - 0.2 31/10/2018 IP130_0.1-0.2 Normal soil 626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP133 0.4 - 0.6 31/10/2018 IP133_0.4-0.6 Normal soil 626161	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
IP133 0.4 - 0.6 31/10/2018 QA2 Field_D soil 626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP136 0.4 - 0.6 31/10/2018 IP136_0.4-0.6 Normal soil 626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP136 0.4 - 0.7 31/10/2018 QA1 Field_D soil 626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP137 0.05 - 0.2 31/10/2018 IP137_0.05-0.2 Normal soil 626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP138 0.05 - 0.2 31/10/2018 IP138_0.05-0.2 Normal soil 626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP140 0.4 - 0.6 31/10/2018 IP140_0.4-0.6 Normal soil 626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP143 0.05 - 0.1 31/10/2018 IP143_0.05-0.1 Normal soil 626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP120 0.2 - 0.3 3/11/2018 TP120 0.2-0.3M Normal soil 626734	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP121 0.4 - 0.6 2/11/2018 TP121 0.4-0.6M Normal soil 626734	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Comments

#1 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe important and should be considered where
#2 In the absence of a guideline value for total chromium, chromium VI value adopted
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#7 PCBs: HIL refers to non-dioxin like PCBs only. Where PCB source is known, or suspected at a site, a site-specific assessme
#8 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#9 To obtain F2 subtract napthalene from the >C10 - C16 fraction.
#10 Not limiting: Derived soil HSL exceeds soil saturation concentration
#11 Only applies where the FA & AF are able to be quantified by gravimetric procedures. Not applicable to free fibres.
#12 Nil

							OP Pesticides													
							Demeton-S	Diazinon	Dichlorvos	Dimethoate	Disulfoton	EPN	Ethion	Ethoprop	Fenitrothion	Fensulfothion	Fenthion	Malathion	Merphos	Methyl parathion	Mevinphos (Phosdrin)	Monocrotophos	Naled (Dibrom)
							mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL							0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2	0.2
NEPM 2013 Table 1A(1) HIL B Res																							
NEPM 2013 Table 1A(1) HIL C Rec																							
NEPM 2013 Table 1A(3) HSL A/B Res Soil for Vapour Intrusion, Sand 0-1m																							
NEPM 2013 Table 7 HSL C Rec Asbestos contamination in soil																							
Location Code	**Depth**	**Date**	**Field ID**	**Sample Type**	**Matrix Type**	**Lab Report Number**																	
BH100	0.05 - 0.15	2/11/2018	BH100 0.05-0.15M	Normal	soil	626734	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
BH100	0.4 - 0.6	2/11/2018	BH100 0.4-0.6M	Normal	soil	626734	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH102	0.4 - 0.5	31/10/2018	BH102_0.4-0.5	Normal	soil	626161	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
BH102	0.9 - 1	31/10/2018	BH102_0.9-1.0	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH107	0.05 - 0.2	30/10/2018	BH107_0.05-0.2	Normal	soil	626161	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
BH107	1.7 - 2	30/10/2018	BH107_1.7-2.0	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH108	0.05 - 0.2	1/11/2018	BH108_0.05-0.2	Normal	soil	626161	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
BH108	0.7 - 1	1/11/2018	BH108_0.7-1.0	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH108	0.7 - 1	1/11/2018	QA3	Field_D	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH109	0.05 - 0.2	30/10/2018	BH109_0.05-0.2	Normal	soil	626161	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
BH109	1.6 - 1.9	30/10/2018	BH109_1.6-1.9	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH110	0.05 - 0.2	1/11/2018	BH110_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH111	0.1 - 0.2	1/11/2018	BH111_0.1-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP130	0.1 - 0.2	31/10/2018	IP130_0.1-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP133	0.4 - 0.6	31/10/2018	IP133_0.4-0.6	Normal	soil	626161	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2
IP133	0.4 - 0.6	31/10/2018	QA2	Field_D	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP136	0.4 - 0.6	31/10/2018	IP136_0.4-0.6	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP136	0.4 - 0.7	31/10/2018	QA1	Field_D	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP137	0.05 - 0.2	31/10/2018	IP137_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP138	0.05 - 0.2	31/10/2018	IP138_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP140	0.4 - 0.6	31/10/2018	IP140_0.4-0.6	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP143	0.05 - 0.1	31/10/2018	IP143_0.05-0.1	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP120	0.2 - 0.3	3/11/2018	TP120 0.2-0.3M	Normal	soil	626734	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP121	0.4 - 0.6	2/11/2018	TP121 0.4-0.6M	Normal	soil	626734	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Comments

#1 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe important and should be considered where
#2 In the absence of a guideline value for total chromium, chromium VI value adopted
#3 Lead: HILs A,B,C based on blood lead models (IEUBK & HIL D on adult lead model for where 50% bioavailability considered
#4 Elemental mercury: HIL does not address elemental mercury. a site specific assessment should be considered if elemental r
#5 Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application should consider presence of carcinogen
#6 Carcinogenic PAHs: HIL based on 8 carc. PAHs & their TEFs (rel to BaP ref Schedule 7) BaP TEQ calc by multiplying the c
#7 PCBs: HIL refers to non-dioxin like PCBs only. Where PCB source is known, or suspected at a site, a site-specific assessme
#8 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#9 To obtain F2 subtract napthalene from the >C10 - C16 fraction.
#10 Not limiting: Derived soil HSL exceeds soil saturation concentration
#11 Only applies where the FA & AF are able to be quantified by gravimetric procedures. Not applicable to free fibres.
#12 Nil

											PCBs							
	Omethoate	Parathion	Phorate	Pirimiphos-methyl	Pyrazophos	Ronnel	Terbufos	Trichloronate	Tetrachlorvinphos	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	PCBs (Total)
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
NEPM 2013 Table 1A(1) HIL B Res																	1 #7
NEPM 2013 Table 1A(1) HIL C Rec																	1 #7
NEPM 2013 Table 1A(3) HSL A/B Res Soil for Vapour Intrusion, Sand 0-1m																	
NEPM 2013 Table 7 HSL C Rec Asbestos contamination in soil																	
Location Code	**Depth**	**Date**	**Field ID**	**Sample Type**	**Matrix Type**	**Lab Report Number**												
BH100	0.05 - 0.15	2/11/2018	BH100 0.05-0.15M	Normal	soil	626734	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH100	0.4 - 0.6	2/11/2018	BH100 0.4-0.6M	Normal	soil	626734	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH102	0.4 - 0.5	31/10/2018	BH102_0.4-0.5	Normal	soil	626161	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH102	0.9 - 1	31/10/2018	BH102_0.9-1.0	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH107	0.05 - 0.2	30/10/2018	BH107_0.05-0.2	Normal	soil	626161	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH107	1.7 - 2	30/10/2018	BH107_1.7-2.0	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH108	0.05 - 0.2	1/11/2018	BH108_0.05-0.2	Normal	soil	626161	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH108	0.7 - 1	1/11/2018	BH108_0.7-1.0	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH108	0.7 - 1	1/11/2018	QA3	Field_D	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH109	0.05 - 0.2	30/10/2018	BH109_0.05-0.2	Normal	soil	626161	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH109	1.6 - 1.9	30/10/2018	BH109_1.6-1.9	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH110	0.05 - 0.2	1/11/2018	BH110_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH111	0.1 - 0.2	1/11/2018	BH111_0.1-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP130	0.1 - 0.2	31/10/2018	IP130_0.1-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP133	0.4 - 0.6	31/10/2018	IP133_0.4-0.6	Normal	soil	626161	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
IP133	0.4 - 0.6	31/10/2018	QA2	Field_D	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP136	0.4 - 0.6	31/10/2018	IP136_0.4-0.6	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP136	0.4 - 0.7	31/10/2018	QA1	Field_D	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP137	0.05 - 0.2	31/10/2018	IP137_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP138	0.05 - 0.2	31/10/2018	IP138_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP140	0.4 - 0.6	31/10/2018	IP140_0.4-0.6	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP143	0.05 - 0.1	31/10/2018	IP143_0.05-0.1	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP120	0.2 - 0.3	3/11/2018	TP120 0.2-0.3M	Normal	soil	626734	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP121	0.4 - 0.6	2/11/2018	TP121 0.4-0.6M	Normal	soil	626734	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Comments

#1 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe important and should be considered where
#2 In the absence of a guideline value for total chromium, chromium VI value adopted
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#7 PCBs: HIL refers to non-dioxin like PCBs only. Where PCB source is known, or suspected at a site, a site-specific assessme
#8 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#9 To obtain F2 subtract napthalene from the >C10 - C16 fraction.
#10 Not limiting: Derived soil HSL exceeds soil saturation concentration
#11 Only applies where the FA & AF are able to be quantified by gravimetric procedures. Not applicable to free fibres.
#12 Nil

									BTEXN							TRH - NEPM 2013				
									Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	Naphthalene (BTEXN)	F1 (C6-C10 minus BTEX)	C6-C10 Fraction	F2 (>C10-C16 minus Naphthalene)	>C10-C16 Fraction	F3 (>C16-C34 Fraction)
									mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL									0.1	0.1	0.1	0.1	0.2	0.3	0.5	20	20	50	50	100
CRC CARE 2011 Soil Direct Contact HSL-C Recreational / Open Space									120	18,000	5,300			15,000	1,900	5,100		3,800		5,300
CRC CARE 2011 Soil Direct Contact HSL-D Commercial / Industrial									430	99,000	27,000			81,000	11,000	26,000		20,000		27,000
Location Code	**Depth**	**Date**	**Field ID**	**Sample Type**	**Matrix Type**	**Lab Report Number**														
BH100	0.05 - 0.15	2/11/2018	BH100 0.05-0.15M	Normal	soil	626734	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100
BH100	0.4 - 0.6	2/11/2018	BH100 0.4-0.6M	Normal	soil	626734	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100
BH102	0.4 - 0.5	31/10/2018	BH102_0.4-0.5	Normal	soil	626161	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100
BH102	0.9 - 1	31/10/2018	BH102_0.9-1.0	Normal	soil	626161	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100
BH107	0.05 - 0.2	30/10/2018	BH107_0.05-0.2	Normal	soil	626161	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	390
BH107	1.7 - 2	30/10/2018	BH107_1.7-2.0	Normal	soil	626161	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100
BH108	0.05 - 0.2	1/11/2018	BH108_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-
BH108	0.7 - 1	1/11/2018	BH108_0.7-1.0	Normal	soil	626161	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100
BH108	0.7 - 1	1/11/2018	QA3	Field_D	soil	626161	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100
BH109	0.05 - 0.2	30/10/2018	BH109_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-
BH109	1.6 - 1.9	30/10/2018	BH109_1.6-1.9	Normal	soil	626161	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100
BH110	0.05 - 0.2	1/11/2018	BH110_0.05-0.2	Normal	soil	626161	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100
BH111	0.1 - 0.2	1/11/2018	BH111_0.1-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-
IP130	0.1 - 0.2	31/10/2018	IP130_0.1-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-
IP133	0.4 - 0.6	31/10/2018	IP133_0.4-0.6	Normal	soil	626161	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100
IP133	0.4 - 0.6	31/10/2018	QA2	Field_D	soil	626161	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100
IP136	0.4 - 0.6	31/10/2018	IP136_0.4-0.6	Normal	soil	626161	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100
IP136	0.4 - 0.7	31/10/2018	QA1	Field_D	soil	626161	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100
IP137	0.05 - 0.2	31/10/2018	IP137_0.05-0.2	Normal	soil	626161	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100
IP138	0.05 - 0.2	31/10/2018	IP138_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-
IP140	0.4 - 0.6	31/10/2018	IP140_0.4-0.6	Normal	soil	626161	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100
IP143	0.05 - 0.1	31/10/2018	IP143_0.05-0.1	Normal	soil	626161	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100
TP120	0.2 - 0.3	3/11/2018	TP120 0.2-0.3M	Normal	soil	626734	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100
TP121	0.4 - 0.6	2/11/2018	TP121 0.4-0.6M	Normal	soil	626734	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100

Comments
#1 Nil

									TRH - NEPM 1999								
							F4 (>C34-C40 Fraction)	>C10-C40 (Sum of Total)	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 (Sum of Total)	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene
							mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL							100	100	20	20	50	50	50	0.5	0.5	0.5	0.5	0.5
CRC CARE 2011 Soil Direct Contact HSL-C Recreational / Open Space							7,400											
CRC CARE 2011 Soil Direct Contact HSL-D Commercial / Industrial							38,000											
Location Code	**Depth**	**Date**	**Field ID**	**Sample Type**	**Matrix Type**	**Lab Report Number**												
BH100	0.05 - 0.15	2/11/2018	BH100 0.05-0.15M	Normal	soil	626734	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5
BH100	0.4 - 0.6	2/11/2018	BH100 0.4-0.6M	Normal	soil	626734	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5
BH102	0.4 - 0.5	31/10/2018	BH102_0.4-0.5	Normal	soil	626161	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5
BH102	0.9 - 1	31/10/2018	BH102_0.9-1.0	Normal	soil	626161	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5
BH107	0.05 - 0.2	30/10/2018	BH107_0.05-0.2	Normal	soil	626161	<100	390	<20	<20	280	120	400	<0.5	<0.5	<0.5	<0.5	<0.5
BH107	1.7 - 2	30/10/2018	BH107_1.7-2.0	Normal	soil	626161	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5
BH108	0.05 - 0.2	1/11/2018	BH108_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-
BH108	0.7 - 1	1/11/2018	BH108_0.7-1.0	Normal	soil	626161	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5
BH108	0.7 - 1	1/11/2018	QA3	Field_D	soil	626161	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5
BH109	0.05 - 0.2	30/10/2018	BH109_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-
BH109	1.6 - 1.9	30/10/2018	BH109_1.6-1.9	Normal	soil	626161	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5
BH110	0.05 - 0.2	1/11/2018	BH110_0.05-0.2	Normal	soil	626161	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5
BH111	0.1 - 0.2	1/11/2018	BH111_0.1-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-
IP130	0.1 - 0.2	31/10/2018	IP130_0.1-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-
IP133	0.4 - 0.6	31/10/2018	IP133_0.4-0.6	Normal	soil	626161	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5
IP133	0.4 - 0.6	31/10/2018	QA2	Field_D	soil	626161	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5
IP136	0.4 - 0.6	31/10/2018	IP136_0.4-0.6	Normal	soil	626161	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5
IP136	0.4 - 0.7	31/10/2018	QA1	Field_D	soil	626161	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5
IP137	0.05 - 0.2	31/10/2018	IP137_0.05-0.2	Normal	soil	626161	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5
IP138	0.05 - 0.2	31/10/2018	IP138_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-
IP140	0.4 - 0.6	31/10/2018	IP140_0.4-0.6	Normal	soil	626161	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5
IP143	0.05 - 0.1	31/10/2018	IP143_0.05-0.1	Normal	soil	626161	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5
TP120	0.2 - 0.3	3/11/2018	TP120 0.2-0.3M	Normal	soil	626734	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5
TP121	0.4 - 0.6	2/11/2018	TP121 0.4-0.6M	Normal	soil	626734	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5

Comments
#1 Nil

							PAHs											
							Benzo[b+j]fluoranthene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a.h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene-PAH	Phenanthrene	Pyrene	PAHs (Sum of total) - Lab calc
							mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL							0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
CRC CARE 2011 Soil Direct Contact HSL-C Recreational / Open Space															1,900			
CRC CARE 2011 Soil Direct Contact HSL-D Commercial / Industrial															11,000			
Location Code	**Depth**	**Date**	**Field ID**	**Sample Type**	**Matrix Type**	**Lab Report Number**												
BH100	0.05 - 0.15	2/11/2018	BH100 0.05-0.15M	Normal	soil	626734	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH100	0.4 - 0.6	2/11/2018	BH100 0.4-0.6M	Normal	soil	626734	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH102	0.4 - 0.5	31/10/2018	BH102_0.4-0.5	Normal	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH102	0.9 - 1	31/10/2018	BH102_0.9-1.0	Normal	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH107	0.05 - 0.2	30/10/2018	BH107_0.05-0.2	Normal	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH107	1.7 - 2	30/10/2018	BH107_1.7-2.0	Normal	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH108	0.05 - 0.2	1/11/2018	BH108_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-
BH108	0.7 - 1	1/11/2018	BH108_0.7-1.0	Normal	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH108	0.7 - 1	1/11/2018	QA3	Field_D	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH109	0.05 - 0.2	30/10/2018	BH109_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-
BH109	1.6 - 1.9	30/10/2018	BH109_1.6-1.9	Normal	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH110	0.05 - 0.2	1/11/2018	BH110_0.05-0.2	Normal	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH111	0.1 - 0.2	1/11/2018	BH111_0.1-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-
IP130	0.1 - 0.2	31/10/2018	IP130_0.1-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-
IP133	0.4 - 0.6	31/10/2018	IP133_0.4-0.6	Normal	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
IP133	0.4 - 0.6	31/10/2018	QA2	Field_D	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
IP136	0.4 - 0.6	31/10/2018	IP136_0.4-0.6	Normal	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
IP136	0.4 - 0.7	31/10/2018	QA1	Field_D	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
IP137	0.05 - 0.2	31/10/2018	IP137_0.05-0.2	Normal	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
IP138	0.05 - 0.2	31/10/2018	IP138_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-
IP140	0.4 - 0.6	31/10/2018	IP140_0.4-0.6	Normal	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
IP143	0.05 - 0.1	31/10/2018	IP143_0.05-0.1	Normal	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TP120	0.2 - 0.3	3/11/2018	TP120 0.2-0.3M	Normal	soil	626734	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TP121	0.4 - 0.6	2/11/2018	TP121 0.4-0.6M	Normal	soil	626734	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Comments
#1 Nil

							Total 8 PAHs (as BaP TEQ)(zero LOR) - Lab Calc	Total 8 PAHs (as BaP TEQ)(half LOR) - Lab Calc	Total 8 PAHs (as BaP TEQ)(full LOR) - Lab Calc
							mg/kg	mg/kg	mg/kg
EQL							0.5	0.5	0.5
CRC CARE 2011 Soil Direct Contact HSL-C Recreational / Open Space									
CRC CARE 2011 Soil Direct Contact HSL-D Commercial / Industrial									
Location Code	**Depth**	**Date**	**Field ID**	**Sample Type**	**Matrix Type**	**Lab Report Number**			
BH100	0.05 - 0.15	2/11/2018	BH100 0.05-0.15M	Normal	soil	626734	<0.5	0.6	1.2
BH100	0.4 - 0.6	2/11/2018	BH100 0.4-0.6M	Normal	soil	626734	<0.5	0.6	1.2
BH102	0.4 - 0.5	31/10/2018	BH102_0.4-0.5	Normal	soil	626161	<0.5	0.6	1.2
BH102	0.9 - 1	31/10/2018	BH102_0.9-1.0	Normal	soil	626161	<0.5	0.6	1.2
BH107	0.05 - 0.2	30/10/2018	BH107_0.05-0.2	Normal	soil	626161	<0.5	0.6	1.2
BH107	1.7 - 2	30/10/2018	BH107_1.7-2.0	Normal	soil	626161	<0.5	0.6	1.2
BH108	0.05 - 0.2	1/11/2018	BH108_0.05-0.2	Normal	soil	626161	-	-	-
BH108	0.7 - 1	1/11/2018	BH108_0.7-1.0	Normal	soil	626161	<0.5	0.6	1.2
BH108	0.7 - 1	1/11/2018	QA3	Field_D	soil	626161	<0.5	0.6	1.2
BH109	0.05 - 0.2	30/10/2018	BH109_0.05-0.2	Normal	soil	626161	-	-	-
BH109	1.6 - 1.9	30/10/2018	BH109_1.6-1.9	Normal	soil	626161	<0.5	0.6	1.2
BH110	0.05 - 0.2	1/11/2018	BH110_0.05-0.2	Normal	soil	626161	<0.5	0.6	1.2
BH111	0.1 - 0.2	1/11/2018	BH111_0.1-0.2	Normal	soil	626161	-	-	-
IP130	0.1 - 0.2	31/10/2018	IP130_0.1-0.2	Normal	soil	626161	-	-	-
IP133	0.4 - 0.6	31/10/2018	IP133_0.4-0.6	Normal	soil	626161	<0.5	0.6	1.2
IP133	0.4 - 0.6	31/10/2018	QA2	Field_D	soil	626161	<0.5	0.6	1.2
IP136	0.4 - 0.6	31/10/2018	IP136_0.4-0.6	Normal	soil	626161	<0.5	0.6	1.2
IP136	0.4 - 0.7	31/10/2018	QA1	Field_D	soil	626161	<0.5	0.6	1.2
IP137	0.05 - 0.2	31/10/2018	IP137_0.05-0.2	Normal	soil	626161	<0.5	0.6	1.2
IP138	0.05 - 0.2	31/10/2018	IP138_0.05-0.2	Normal	soil	626161	-	-	-
IP140	0.4 - 0.6	31/10/2018	IP140_0.4-0.6	Normal	soil	626161	<0.5	0.6	1.2
IP143	0.05 - 0.1	31/10/2018	IP143_0.05-0.1	Normal	soil	626161	<0.5	0.6	1.2
TP120	0.2 - 0.3	3/11/2018	TP120 0.2-0.3M	Normal	soil	626734	<0.5	0.6	1.2
TP121	0.4 - 0.6	2/11/2018	TP121 0.4-0.6M	Normal	soil	626734	<0.5	0.6	1.2

Comments
#1 Nil

							Inorganics			Particle Size Analysis	Exchangeable cations	TOC			Asbestos	
							Electrical conductivity (lab)	Moisture Content (dried @ 103°C)	pH (aqueous extract)	Clay (<2 µm)	CEC	Total Organic Carbon	Organic Fibres - Comment	Respirable Fibres - Comment	Asbestos from ACM in Soil	Asbestos from FA & AF in Soil
							µS/cm	%	pH Units	%	meq/100g	%	Comment	Comment	%w/w	%w/w
EQL							10	1	0.1	1	0.05	0.1				
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																
NEPM 2013 EIL-Urban Residential- Public Open Space																
0-2m																
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil																
0-2m																
Location Code	**Depth**	**Date**	**Field ID**	**Sample Type**	**Matrix Type**	**Lab Report Number**										
BH100	0.05 - 0.15	2/11/2018	BH100 0.05-0.15M	Normal	soil	626734	-	10	-	-	-	-	Organic fibres detected.	No respirable fibres detected.	-	-
BH100	0.4 - 0.6	2/11/2018	BH100 0.4-0.6M	Normal	soil	626734	-	7.2	-	-	-	-	-	-	-	-
BH102	0.4 - 0.5	31/10/2018	BH102_0.4-0.5	Normal	soil	626161	-	9.9	-	-	-	-	Organic fibres detected.	No respirable fibres detected.	-	-
BH102	0.9 - 1	31/10/2018	BH102_0.9-1.0	Normal	soil	626161	-	13	-	-	-	-	-	-	-	-
BH107	0.05 - 0.2	30/10/2018	BH107_0.05-0.2	Normal	soil	626161	-	13	-	-	-	-	Organic fibres detected.	No respirable fibres detected.	-	-
BH107	1.7 - 2	30/10/2018	BH107_1.7-2.0	Normal	soil	626161	190	24	9.0	12	43	0.3	-	-	-	-
BH108	0.05 - 0.2	1/11/2018	BH108_0.05-0.2	Normal	soil	626161	-	7.6	-	-	-	-	Organic fibres detected.	No respirable fibres detected.	-	-
BH108	0.7 - 1	1/11/2018	BH108_0.7-1.0	Normal	soil	626161	-	8.2	-	-	-	-	-	-	-	-
BH108	0.7 - 1	1/11/2018	QA3	Field_D	soil	626161	-	7.0	-	-	-	-	-	-	-	-
BH109	0.05 - 0.2	30/10/2018	BH109_0.05-0.2	Normal	soil	626161	-	24	-	-	-	-	Organic fibres detected.	No respirable fibres detected.	-	-
BH109	1.6 - 1.9	30/10/2018	BH109_1.6-1.9	Normal	soil	626161	-	8.3	-	-	-	-	-	-	-	-
BH110	0.05 - 0.2	1/11/2018	BH110_0.05-0.2	Normal	soil	626161	-	14	-	-	-	-	Organic fibres detected.	No respirable fibres detected.	-	-
BH111	0.1 - 0.2	1/11/2018	BH111_0.1-0.2	Normal	soil	626161	-	-	-	-	-	-	Organic fibres detected.	No respirable fibres detected.	-	-
IP130	0.1 - 0.2	31/10/2018	IP130_0.1-0.2	Normal	soil	626161	-	-	-	-	-	-	Organic fibres detected.	No respirable fibres detected.	-	-
IP133	0.4 - 0.6	31/10/2018	IP133_0.4-0.6	Normal	soil	626161	-	3.1	-	-	-	-	-	-	-	-
IP133	0.4 - 0.6	31/10/2018	QA2	Field_D	soil	626161	-	2.9	-	-	-	-	-	-	-	-
IP136	0.4 - 0.6	31/10/2018	IP136_0.4-0.6	Normal	soil	626161	-	11	-	-	-	-	-	-	-	-
IP136	0.4 - 0.7	31/10/2018	QA1	Field_D	soil	626161	-	12	-	-	-	-	-	-	-	-
IP137	0.05 - 0.2	31/10/2018	IP137_0.05-0.2	Normal	soil	626161	-	6.1	-	-	-	-	-	-	-	-
IP138	0.05 - 0.2	31/10/2018	IP138_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	Organic fibres detected.	No respirable fibres detected.	-	-
IP140	0.4 - 0.6	31/10/2018	IP140_0.4-0.6	Normal	soil	626161	-	5.1	-	-	-	-	-	-	-	-
IP143	0.05 - 0.1	31/10/2018	IP143_0.05-0.1	Normal	soil	626161	-	8.9	-	-	-	-	Organic fibres detected.	No respirable fibres detected.	-	-
TP120	0.2 - 0.3	3/11/2018	TP120 0.2-0.3M	Normal	soil	626734	-	13	-	-	-	-	Organic fibres detected.	No respirable fibres detected.	-	-
TP121	0.4 - 0.6	2/11/2018	TP121 0.4-0.6M	Normal	soil	626734	-	10.0	-	-	-	-	-	-	-	-

Comments

#1 Separate management limits for BTEX & napthalene are not available hence should not be subtracted from the relevant fractions to obtain F1 & F2

#2 Develop site specific based on CEC, pH, clay content, state and traffic volume

#3 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.

#4 Errata 30 April 2014 - Naphthalene should not be subtracted from >C10-C16 (as there is no separate ESL for naphthalene)

#5 Nil

		Metals									
	Asbestos Reported Result	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc	Benzene	Toluene
	Comment	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		2	0.4	5	5	5	0.1	5	5	0.1	0.1
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil											
NEPM 2013 EIL-Urban Residential- Public Open Space											
0-2m		100		410	230	1,100		350	1000		
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil											
0-2m										50	85

Location Code	Depth	Date	Field ID	Sample Type	Matrix Type	Lab Report Number										
BH100	0.05 - 0.15	2/11/2018	BH100 0.05-0.15M	Normal	soil	626734	No asbestos detected at the reporting limit of 0.01% w/w.	2.6	<0.4	130	40	10	<0.1	190	78	<0.1	<0.1
BH100	0.4 - 0.6	2/11/2018	BH100 0.4-0.6M	Normal	soil	626734	-	2.6	<0.4	27	7.4	6.5	<0.1	16	18	<0.1	<0.1
BH102	0.4 - 0.5	31/10/2018	BH102_0.4-0.5	Normal	soil	626161	No asbestos detected at the reporting limit of 0.01% w/w.	2.4	<0.4	25	11	13	<0.1	15	53	<0.1	<0.1
BH102	0.9 - 1	31/10/2018	BH102_0.9-1.0	Normal	soil	626161	-	2.7	<0.4	22	8.5	8.7	<0.1	12	23	<0.1	<0.1
BH107	0.05 - 0.2	30/10/2018	BH107_0.05-0.2	Normal	soil	626161	No asbestos detected at the reporting limit of 0.01% w/w.	2.6	<0.4	19	9.0	10	<0.1	11	32	<0.1	<0.1
BH107	1.7 - 2	30/10/2018	BH107_1.7-2.0	Normal	soil	626161	-	2.6	<0.4	19	9.2	9.9	<0.1	13	20	<0.1	<0.1
BH108	0.05 - 0.2	1/11/2018	BH108_0.05-0.2	Normal	soil	626161	No asbestos detected at the reporting limit of 0.01% w/w.	-	-	-	-	-	-	-	-	-	-
BH108	0.7 - 1	1/11/2018	BH108_0.7-1.0	Normal	soil	626161	-	3.0	<0.4	23	8.7	9.7	<0.1	13	20	<0.1	<0.1
BH108	0.7 - 1	1/11/2018	QA3	Field_D	soil	626161	-	2.7	<0.4	23	7.8	10	<0.1	9.6	22	<0.1	<0.1
BH109	0.05 - 0.2	30/10/2018	BH109_0.05-0.2	Normal	soil	626161	No asbestos detected at the reporting limit of 0.01% w/w.	-	-	-	-	-	-	-	-	-	-
BH109	1.6 - 1.9	30/10/2018	BH109_1.6-1.9	Normal	soil	626161	-	2.9	<0.4	12	<5	12	<0.1	8.6	7.7	<0.1	<0.1
BH110	0.05 - 0.2	1/11/2018	BH110_0.05-0.2	Normal	soil	626161	No asbestos detected at the reporting limit of 0.01% w/w.	3.3	<0.4	24	7.3	8.2	<0.1	9.2	17	<0.1	<0.1
BH111	0.1 - 0.2	1/11/2018	BH111_0.1-0.2	Normal	soil	626161	No asbestos detected at the reporting limit of 0.01% w/w.	-	-	-	-	-	-	-	-	-	-
IP130	0.1 - 0.2	31/10/2018	IP130_0.1-0.2	Normal	soil	626161	No asbestos detected at the reporting limit of 0.01% w/w.	-	-	-	-	-	-	-	-	-	-
IP133	0.4 - 0.6	31/10/2018	IP133_0.4-0.6	Normal	soil	626161	-	2.6	<0.4	19	7.6	14	<0.1	8.5	31	<0.1	<0.1
IP133	0.4 - 0.6	31/10/2018	QA2	Field_D	soil	626161	-	2.7	<0.4	19	7.5	14	<0.1	8.0	27	<0.1	<0.1
IP136	0.4 - 0.6	31/10/2018	IP136_0.4-0.6	Normal	soil	626161	-	3.3	<0.4	33	11	9.1	<0.1	22	21	<0.1	<0.1
IP136	0.4 - 0.7	31/10/2018	QA1	Field_D	soil	626161	-	3.8	<0.4	33	12	9.5	<0.1	24	22	<0.1	<0.1
IP137	0.05 - 0.2	31/10/2018	IP137_0.05-0.2	Normal	soil	626161	-	2.7	<0.4	24	8.1	10	<0.1	9.4	24	<0.1	<0.1
IP138	0.05 - 0.2	31/10/2018	IP138_0.05-0.2	Normal	soil	626161	No asbestos detected at the reporting limit of 0.01% w/w.	-	-	-	-	-	-	-	-	-	-
IP140	0.4 - 0.6	31/10/2018	IP140_0.4-0.6	Normal	soil	626161	-	2.3	<0.4	24	7.1	6.6	<0.1	12	15	<0.1	<0.1
IP143	0.05 - 0.1	31/10/2018	IP143_0.05-0.1	Normal	soil	626161	No asbestos detected at the reporting limit of 0.01% w/w.	<2	<0.4	16	<5	6.5	<0.1	<5	14	<0.1	<0.1
TP120	0.2 - 0.3	3/11/2018	TP120 0.2-0.3M	Normal	soil	626734	No asbestos detected at the reporting limit of 0.01% w/w.	5.6	<0.4	81	27	8.5	<0.1	100	52	<0.1	<0.1
TP121	0.4 - 0.6	2/11/2018	TP121 0.4-0.6M	Normal	soil	626734	-	2.6	<0.4	69	24	6.8	<0.1	84	43	<0.1	<0.1

Comments

#1 Separate management limits for BTEX & napthalene are not available hence should not be subtracted from the relevant fractions to obtain F1 & F2

#2 Develop site specific based on CEC, pH, clay content, state and traffic volume

#3 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.

#4 Errata 30 April 2014 - Naphthalene should not be subtracted from >C10-C16 (as there is no separate ESL for naphthalene)

#5 Nil

	BTEXN					TRH - NEPM 2013							TRH - NEPM 19		
	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	Naphthalene (BTEXN)	F1 (C6-C10 minus BTEX)	C6-C10 Fraction	F2 (>C10-C16 minus Naphthalene)	>C10-C16 Fraction	F3 (>C16-C34 Fraction)	F4 (>C34-C40 Fraction)	>C10-C40 (Sum of Total)	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.1	0.1	0.2	0.3	0.5	20	20	50	50	100	100	100	20	20	50
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil							700[#1]		1,000[#1]	2,500	10,000				
NEPM 2013 EIL-Urban Residential- Public Open Space															
0-2m					170										
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil															
0-2m	70			105		180[#3]			120[#4]	300	2,800				

Location Code	Depth	Date	Field ID	Sample Type	Matrix Type	Lab Report Number													
BH100	0.05 - 0.15	2/11/2018	BH100 0.05-0.15M	Normal	soil	626734	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50
BH100	0.4 - 0.6	2/11/2018	BH100 0.4-0.6M	Normal	soil	626734	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50
BH102	0.4 - 0.5	31/10/2018	BH102_0.4-0.5	Normal	soil	626161	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50
BH102	0.9 - 1	31/10/2018	BH102_0.9-1.0	Normal	soil	626161	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50
BH107	0.05 - 0.2	30/10/2018	BH107_0.05-0.2	Normal	soil	626161	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	390	<100	390	<20	<20	280
BH107	1.7 - 2	30/10/2018	BH107_1.7-2.0	Normal	soil	626161	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50
BH108	0.05 - 0.2	1/11/2018	BH108_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH108	0.7 - 1	1/11/2018	BH108_0.7-1.0	Normal	soil	626161	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50
BH108	0.7 - 1	1/11/2018	QA3	Field_D	soil	626161	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50
BH109	0.05 - 0.2	30/10/2018	BH109_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH109	1.6 - 1.9	30/10/2018	BH109_1.6-1.9	Normal	soil	626161	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50
BH110	0.05 - 0.2	1/11/2018	BH110_0.05-0.2	Normal	soil	626161	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50
BH111	0.1 - 0.2	1/11/2018	BH111_0.1-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP130	0.1 - 0.2	31/10/2018	IP130_0.1-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP133	0.4 - 0.6	31/10/2018	IP133_0.4-0.6	Normal	soil	626161	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50
IP133	0.4 - 0.6	31/10/2018	QA2	Field_D	soil	626161	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50
IP136	0.4 - 0.6	31/10/2018	IP136_0.4-0.6	Normal	soil	626161	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50
IP136	0.4 - 0.7	31/10/2018	QA1	Field_D	soil	626161	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50
IP137	0.05 - 0.2	31/10/2018	IP137_0.05-0.2	Normal	soil	626161	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50
IP138	0.05 - 0.2	31/10/2018	IP138_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP140	0.4 - 0.6	31/10/2018	IP140_0.4-0.6	Normal	soil	626161	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50
IP143	0.05 - 0.1	31/10/2018	IP143_0.05-0.1	Normal	soil	626161	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50
TP120	0.2 - 0.3	3/11/2018	TP120 0.2-0.3M	Normal	soil	626734	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50
TP121	0.4 - 0.6	2/11/2018	TP121 0.4-0.6M	Normal	soil	626734	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20	<50	<50	<100	<100	<100	<20	<20	<50

Comments

#1 Separate management limits for BTEX & napthalene are not available hence should not be subtracted from the relevant fractions to obtain F1 & F2

#2 Develop site specific based on CEC, pH, clay content, state and traffic volume

#3 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.

#4 Errata 30 April 2014 - Naphthalene should not be subtracted from >C10-C16 (as there is no separate ESL for naphthalene)

#5 Nil

							99		PAHs													
							C29-C36 Fraction	C10-C36 (Sum of Total)	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo[b+j]fluoranthene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene
							mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL							50	50	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																					
NEPM 2013 EIL-Urban Residential- Public Open Space																					
0-2m																					
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil																					
0-2m													0.7								
Location Code	**Depth**	**Date**	**Field ID**	**Sample Type**	**Matrix Type**	**Lab Report Number**															
BH100	0.05 - 0.15	2/11/2018	BH100 0.05-0.15M	Normal	soil	626734	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH100	0.4 - 0.6	2/11/2018	BH100 0.4-0.6M	Normal	soil	626734	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH102	0.4 - 0.5	31/10/2018	BH102_0.4-0.5	Normal	soil	626161	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH102	0.9 - 1	31/10/2018	BH102_0.9-1.0	Normal	soil	626161	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH107	0.05 - 0.2	30/10/2018	BH107_0.05-0.2	Normal	soil	626161	120	400	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH107	1.7 - 2	30/10/2018	BH107_1.7-2.0	Normal	soil	626161	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH108	0.05 - 0.2	1/11/2018	BH108_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH108	0.7 - 1	1/11/2018	BH108_0.7-1.0	Normal	soil	626161	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH108	0.7 - 1	1/11/2018	QA3	Field_D	soil	626161	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH109	0.05 - 0.2	30/10/2018	BH109_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH109	1.6 - 1.9	30/10/2018	BH109_1.6-1.9	Normal	soil	626161	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH110	0.05 - 0.2	1/11/2018	BH110_0.05-0.2	Normal	soil	626161	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH111	0.1 - 0.2	1/11/2018	BH111_0.1-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP130	0.1 - 0.2	31/10/2018	IP130_0.1-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP133	0.4 - 0.6	31/10/2018	IP133_0.4-0.6	Normal	soil	626161	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
IP133	0.4 - 0.6	31/10/2018	QA2	Field_D	soil	626161	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
IP136	0.4 - 0.6	31/10/2018	IP136_0.4-0.6	Normal	soil	626161	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
IP136	0.4 - 0.7	31/10/2018	QA1	Field_D	soil	626161	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
IP137	0.05 - 0.2	31/10/2018	IP137_0.05-0.2	Normal	soil	626161	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
IP138	0.05 - 0.2	31/10/2018	IP138_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP140	0.4 - 0.6	31/10/2018	IP140_0.4-0.6	Normal	soil	626161	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
IP143	0.05 - 0.1	31/10/2018	IP143_0.05-0.1	Normal	soil	626161	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TP120	0.2 - 0.3	3/11/2018	TP120 0.2-0.3M	Normal	soil	626734	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TP121	0.4 - 0.6	2/11/2018	TP121 0.4-0.6M	Normal	soil	626734	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Comments

#1 Separate management limits for BTEX & napthalene are not available hence should not be subtracted from the relevant fractions to obtain F1 & F2

#2 Develop site specific based on CEC, pH, clay content, state and traffic volume

#3 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.

#4 Errata 30 April 2014 - Naphthalene should not be subtracted from >C10-C16 (as there is no separate ESL for naphthalene)

#5 Nil

									Naphthalene-PAH	Phenanthrene	Pyrene	PAHs (Sum of total) - Lab calc	Total 8 PAHs (as BaP TEQ)(zero LOR) - Lab Calc	Total 8 PAHs (as BaP TEQ)(half LOR) - Lab Calc	Total 8 PAHs (as BaP TEQ)(full LOR) - Lab Calc	Organochlorine pesticides EPAVic	Other organochlorine pesticides EPAVic	4,4-DDE
									mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL									0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.1	0.1	0.05
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																		
NEPM 2013 EIL-Urban Residential- Public Open Space																		
0-2m									170									
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil																		
0-2m																		
Location Code	**Depth**	**Date**	**Field ID**	**Sample Type**	**Matrix Type**	**Lab Report Number**												
BH100	0.05 - 0.15	2/11/2018	BH100 0.05-0.15M	Normal	soil	626734	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.05	<0.05	<0.05
BH100	0.4 - 0.6	2/11/2018	BH100 0.4-0.6M	Normal	soil	626734	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	-	-	-	-
BH102	0.4 - 0.5	31/10/2018	BH102_0.4-0.5	Normal	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.05	<0.05	<0.05
BH102	0.9 - 1	31/10/2018	BH102_0.9-1.0	Normal	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	-	-	-	-
BH107	0.05 - 0.2	30/10/2018	BH107_0.05-0.2	Normal	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.05	<0.05	<0.05
BH107	1.7 - 2	30/10/2018	BH107_1.7-2.0	Normal	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	-	-	-	-
BH108	0.05 - 0.2	1/11/2018	BH108_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	<0.1	<0.1	<0.05	<0.05	<0.05
BH108	0.7 - 1	1/11/2018	BH108_0.7-1.0	Normal	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	-	-	-	-
BH108	0.7 - 1	1/11/2018	QA3	Field_D	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	-	-	-	-
BH109	0.05 - 0.2	30/10/2018	BH109_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	<0.1	<0.1	<0.05	<0.05	<0.05
BH109	1.6 - 1.9	30/10/2018	BH109_1.6-1.9	Normal	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	-	-	-	-
BH110	0.05 - 0.2	1/11/2018	BH110_0.05-0.2	Normal	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	-	-	-	-
BH111	0.1 - 0.2	1/11/2018	BH111_0.1-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-
IP130	0.1 - 0.2	31/10/2018	IP130_0.1-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-
IP133	0.4 - 0.6	31/10/2018	IP133_0.4-0.6	Normal	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.05	<0.05	<0.05
IP133	0.4 - 0.6	31/10/2018	QA2	Field_D	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	-	-	-	-
IP136	0.4 - 0.6	31/10/2018	IP136_0.4-0.6	Normal	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	-	-	-	-
IP136	0.4 - 0.7	31/10/2018	QA1	Field_D	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	-	-	-	-
IP137	0.05 - 0.2	31/10/2018	IP137_0.05-0.2	Normal	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	-	-	-	-
IP138	0.05 - 0.2	31/10/2018	IP138_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-
IP140	0.4 - 0.6	31/10/2018	IP140_0.4-0.6	Normal	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	-	-	-	-
IP143	0.05 - 0.1	31/10/2018	IP143_0.05-0.1	Normal	soil	626161	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	-	-	-	-
TP120	0.2 - 0.3	3/11/2018	TP120 0.2-0.3M	Normal	soil	626734	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	-	-	-	-
TP121	0.4 - 0.6	2/11/2018	TP121 0.4-0.6M	Normal	soil	626734	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	-	-	-	-

									a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane					
									mg/kg	mg/kg	mg/kg	mg/kg	mg/kg					
EQL									0.05	0.05	0.05	0.05	0.1					
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																		
NEPM 2013 EIL-Urban Residential- Public Open Space																		
0-2m																		
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil																		
0-2m																		
BH100	0.05 - 0.15	2/11/2018	BH100 0.05-0.15M	Normal	soil	626734	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1						
BH100	0.4 - 0.6	2/11/2018	BH100 0.4-0.6M	Normal	soil	626734	-	-	-	-	-	-						
BH102	0.4 - 0.5	31/10/2018	BH102_0.4-0.5	Normal	soil	626161	<0.05	<0.05	<0.05	0.08	<0.05	<0.1						
BH102	0.9 - 1	31/10/2018	BH102_0.9-1.0	Normal	soil	626161	-	-	-	-	-	-						
BH107	0.05 - 0.2	30/10/2018	BH107_0.05-0.2	Normal	soil	626161	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1						
BH107	1.7 - 2	30/10/2018	BH107_1.7-2.0	Normal	soil	626161	-	-	-	-	-	-						
BH108	0.05 - 0.2	1/11/2018	BH108_0.05-0.2	Normal	soil	626161	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1						
BH108	0.7 - 1	1/11/2018	BH108_0.7-1.0	Normal	soil	626161	-	-	-	-	-	-						
BH108	0.7 - 1	1/11/2018	QA3	Field_D	soil	626161	-	-	-	-	-	-						
BH109	0.05 - 0.2	30/10/2018	BH109_0.05-0.2	Normal	soil	626161	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1						
BH109	1.6 - 1.9	30/10/2018	BH109_1.6-1.9	Normal	soil	626161	-	-	-	-	-	-						
BH110	0.05 - 0.2	1/11/2018	BH110_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-						
BH111	0.1 - 0.2	1/11/2018	BH111_0.1-0.2	Normal	soil	626161	-	-	-	-	-	-						
IP130	0.1 - 0.2	31/10/2018	IP130_0.1-0.2	Normal	soil	626161	-	-	-	-	-	-						
IP133	0.4 - 0.6	31/10/2018	IP133_0.4-0.6	Normal	soil	626161	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1						
IP133	0.4 - 0.6	31/10/2018	QA2	Field_D	soil	626161	-	-	-	-	-	-						
IP136	0.4 - 0.6	31/10/2018	IP136_0.4-0.6	Normal	soil	626161	-	-	-	-	-	-						
IP136	0.4 - 0.7	31/10/2018	QA1	Field_D	soil	626161	-	-	-	-	-	-						
IP137	0.05 - 0.2	31/10/2018	IP137_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-						
IP138	0.05 - 0.2	31/10/2018	IP138_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-						
IP140	0.4 - 0.6	31/10/2018	IP140_0.4-0.6	Normal	soil	626161	-	-	-	-	-	-						
IP143	0.05 - 0.1	31/10/2018	IP143_0.05-0.1	Normal	soil	626161	-	-	-	-	-	-						
TP120	0.2 - 0.3	3/11/2018	TP120 0.2-0.3M	Normal	soil	626734	-	-	-	-	-	-						
TP121	0.4 - 0.6	2/11/2018	TP121 0.4-0.6M	Normal	soil	626734	-	-	-	-	-	-						

Comments

#1 Separate management limits for BTEX & napthalene are not available hence should not be subtracted from the relevant fractions to obtain F1 & F2

#2 Develop site specific based on CEC, pH, clay content, state and traffic volume

#3 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.

#4 Errata 30 April 2014 - Naphthalene should not be subtracted from >C10-C16 (as there is no separate ESL for naphthalene)

#5 Nil

							OC Pesticides													
							d-BHC	4,4 DDD	4,4 DDT	DDT+DDE+DDD - Lab Calc	Dieldrin	Endosulfan I (alpha)	Endosulfan II (beta)	Endosulfan Sulfate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Hexachlorobenzene
							mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL							0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																					
NEPM 2013 EIL-Urban Residential- Public Open Space																					
0-2m									180	180											
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil																					
0-2m																					
Location Code	**Depth**	**Date**	**Field ID**	**Sample Type**	**Matrix Type**	**Lab Report Number**															
BH100	0.05 - 0.15	2/11/2018	BH100 0.05-0.15M	Normal	soil	626734	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BH100	0.4 - 0.6	2/11/2018	BH100 0.4-0.6M	Normal	soil	626734	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH102	0.4 - 0.5	31/10/2018	BH102_0.4-0.5	Normal	soil	626161	<0.05	<0.05	<0.05	<0.05	0.08	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BH102	0.9 - 1	31/10/2018	BH102_0.9-1.0	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH107	0.05 - 0.2	30/10/2018	BH107_0.05-0.2	Normal	soil	626161	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BH107	1.7 - 2	30/10/2018	BH107_1.7-2.0	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH108	0.05 - 0.2	1/11/2018	BH108_0.05-0.2	Normal	soil	626161	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BH108	0.7 - 1	1/11/2018	BH108_0.7-1.0	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH108	0.7 - 1	1/11/2018	QA3	Field_D	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH109	0.05 - 0.2	30/10/2018	BH109_0.05-0.2	Normal	soil	626161	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BH109	1.6 - 1.9	30/10/2018	BH109_1.6-1.9	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH110	0.05 - 0.2	1/11/2018	BH110_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH111	0.1 - 0.2	1/11/2018	BH111_0.1-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP130	0.1 - 0.2	31/10/2018	IP130_0.1-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP133	0.4 - 0.6	31/10/2018	IP133_0.4-0.6	Normal	soil	626161	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
IP133	0.4 - 0.6	31/10/2018	QA2	Field_D	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP136	0.4 - 0.6	31/10/2018	IP136_0.4-0.6	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP136	0.4 - 0.7	31/10/2018	QA1	Field_D	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP137	0.05 - 0.2	31/10/2018	IP137_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP138	0.05 - 0.2	31/10/2018	IP138_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP140	0.4 - 0.6	31/10/2018	IP140_0.4-0.6	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP143	0.05 - 0.1	31/10/2018	IP143_0.05-0.1	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP120	0.2 - 0.3	3/11/2018	TP120 0.2-0.3M	Normal	soil	626734	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP121	0.4 - 0.6	2/11/2018	TP121 0.4-0.6M	Normal	soil	626734	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Comments

#1 Separate management limits for BTEX & napthalene are not available hence should not be subtracted from the relevant fractions to obtain F1 & F2

#2 Develop site specific based on CEC, pH, clay content, state and traffic volume

#3 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.

#4 Errata 30 April 2014 - Naphthalene should not be subtracted from >C10-C16 (as there is no separate ESL for naphthalene)

#5 Nil

							Methoxychlor	Toxaphene	Tokuthion	Azinphos methyl	Bolstar (Sulprofos)	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Coumaphos	Demeton-O	Demeton-S	Diazinon	Dichlorvos	Dimethoate	Disulfoton
							mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL							0.05	1	0.2	0.2	0.2	0.2	0.2	0.2	2	0.2	0.2	0.2	0.2	0.2	0.2
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																				
NEPM 2013 EIL-Urban Residential- Public Open Space																				
0-2m																				
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil																				
0-2m																				
Location Code	**Depth**	**Date**	**Field ID**	**Sample Type**	**Matrix Type**	**Lab Report Number**														
BH100	0.05 - 0.15	2/11/2018	BH100 0.05-0.15M	Normal	soil	626734	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH100	0.4 - 0.6	2/11/2018	BH100 0.4-0.6M	Normal	soil	626734	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH102	0.4 - 0.5	31/10/2018	BH102_0.4-0.5	Normal	soil	626161	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH102	0.9 - 1	31/10/2018	BH102_0.9-1.0	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH107	0.05 - 0.2	30/10/2018	BH107_0.05-0.2	Normal	soil	626161	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH107	1.7 - 2	30/10/2018	BH107_1.7-2.0	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH108	0.05 - 0.2	1/11/2018	BH108_0.05-0.2	Normal	soil	626161	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH108	0.7 - 1	1/11/2018	BH108_0.7-1.0	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH108	0.7 - 1	1/11/2018	QA3	Field_D	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH109	0.05 - 0.2	30/10/2018	BH109_0.05-0.2	Normal	soil	626161	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH109	1.6 - 1.9	30/10/2018	BH109_1.6-1.9	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH110	0.05 - 0.2	1/11/2018	BH110_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH111	0.1 - 0.2	1/11/2018	BH111_0.1-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP130	0.1 - 0.2	31/10/2018	IP130_0.1-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP133	0.4 - 0.6	31/10/2018	IP133_0.4-0.6	Normal	soil	626161	<0.05	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
IP133	0.4 - 0.6	31/10/2018	QA2	Field_D	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP136	0.4 - 0.6	31/10/2018	IP136_0.4-0.6	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP136	0.4 - 0.7	31/10/2018	QA1	Field_D	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP137	0.05 - 0.2	31/10/2018	IP137_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP138	0.05 - 0.2	31/10/2018	IP138_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP140	0.4 - 0.6	31/10/2018	IP140_0.4-0.6	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP143	0.05 - 0.1	31/10/2018	IP143_0.05-0.1	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP120	0.2 - 0.3	3/11/2018	TP120 0.2-0.3M	Normal	soil	626734	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP121	0.4 - 0.6	2/11/2018	TP121 0.4-0.6M	Normal	soil	626734	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Comments

#1 Separate management limits for BTEX & napthalene are not available hence should not be subtracted from the relevant fractions to obtain F1 & F2

#2 Develop site specific based on CEC, pH, clay content, state and traffic volume

#3 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.

#4 Errata 30 April 2014 - Naphthalene should not be subtracted from >C10-C16 (as there is no separate ESL for naphthalene)

#5 Nil

											OP Pesticides									
											EPN	Ethion	Ethoprop	Fenitrothion	Fensulfothion	Fenthion	Malathion	Merphos	Methyl parathion	Mevinphos (Phosdrin)
											mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL											0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																				
NEPM 2013 EIL-Urban Residential- Public Open Space																				
0-2m																				
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil																				
0-2m																				
Location Code	**Depth**	**Date**	**Field ID**	**Sample Type**	**Matrix Type**	**Lab Report Number**														
BH100	0.05 - 0.15	2/11/2018	BH100 0.05-0.15M	Normal	soil	626734	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH100	0.4 - 0.6	2/11/2018	BH100 0.4-0.6M	Normal	soil	626734	-	-	-	-	-	-	-	-	-	-
BH102	0.4 - 0.5	31/10/2018	BH102_0.4-0.5	Normal	soil	626161	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH102	0.9 - 1	31/10/2018	BH102_0.9-1.0	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-
BH107	0.05 - 0.2	30/10/2018	BH107_0.05-0.2	Normal	soil	626161	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH107	1.7 - 2	30/10/2018	BH107_1.7-2.0	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-
BH108	0.05 - 0.2	1/11/2018	BH108_0.05-0.2	Normal	soil	626161	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH108	0.7 - 1	1/11/2018	BH108_0.7-1.0	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-
BH108	0.7 - 1	1/11/2018	QA3	Field_D	soil	626161	-	-	-	-	-	-	-	-	-	-
BH109	0.05 - 0.2	30/10/2018	BH109_0.05-0.2	Normal	soil	626161	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH109	1.6 - 1.9	30/10/2018	BH109_1.6-1.9	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-
BH110	0.05 - 0.2	1/11/2018	BH110_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-
BH111	0.1 - 0.2	1/11/2018	BH111_0.1-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-
IP130	0.1 - 0.2	31/10/2018	IP130_0.1-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-
IP133	0.4 - 0.6	31/10/2018	IP133_0.4-0.6	Normal	soil	626161	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
IP133	0.4 - 0.6	31/10/2018	QA2	Field_D	soil	626161	-	-	-	-	-	-	-	-	-	-
IP136	0.4 - 0.6	31/10/2018	IP136_0.4-0.6	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-
IP136	0.4 - 0.7	31/10/2018	QA1	Field_D	soil	626161	-	-	-	-	-	-	-	-	-	-
IP137	0.05 - 0.2	31/10/2018	IP137_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-
IP138	0.05 - 0.2	31/10/2018	IP138_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-
IP140	0.4 - 0.6	31/10/2018	IP140_0.4-0.6	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-
IP143	0.05 - 0.1	31/10/2018	IP143_0.05-0.1	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-
TP120	0.2 - 0.3	3/11/2018	TP120 0.2-0.3M	Normal	soil	626734	-	-	-	-	-	-	-	-	-	-
TP121	0.4 - 0.6	2/11/2018	TP121 0.4-0.6M	Normal	soil	626734	-	-	-	-	-	-	-	-	-	-

											OP Pesticides									
											Monocrotophos	Naled (Dibrom)	Omethoate	Parathion	Phorate					
											mg/kg	mg/kg	mg/kg	mg/kg	mg/kg					
EQL											2	0.2	2	0.2	0.2					
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																				
NEPM 2013 EIL-Urban Residential- Public Open Space																				
0-2m																				
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil																				
0-2m																				
Location Code	**Depth**	**Date**	**Field ID**	**Sample Type**	**Matrix Type**	**Lab Report Number**														
BH100	0.05 - 0.15	2/11/2018	BH100 0.05-0.15M	Normal	soil	626734	<2	<0.2	<2	<0.2	<0.2					
BH100	0.4 - 0.6	2/11/2018	BH100 0.4-0.6M	Normal	soil	626734	-	-	-	-	-					
BH102	0.4 - 0.5	31/10/2018	BH102_0.4-0.5	Normal	soil	626161	<2	<0.2	<2	<0.2	<0.2					
BH102	0.9 - 1	31/10/2018	BH102_0.9-1.0	Normal	soil	626161	-	-	-	-	-					
BH107	0.05 - 0.2	30/10/2018	BH107_0.05-0.2	Normal	soil	626161	<2	<0.2	<2	<0.2	<0.2					
BH107	1.7 - 2	30/10/2018	BH107_1.7-2.0	Normal	soil	626161	-	-	-	-	-					
BH108	0.05 - 0.2	1/11/2018	BH108_0.05-0.2	Normal	soil	626161	<2	<0.2	<2	<0.2	<0.2					
BH108	0.7 - 1	1/11/2018	BH108_0.7-1.0	Normal	soil	626161	-	-	-	-	-					
BH108	0.7 - 1	1/11/2018	QA3	Field_D	soil	626161	-	-	-	-	-					
BH109	0.05 - 0.2	30/10/2018	BH109_0.05-0.2	Normal	soil	626161	<2	<0.2	<2	<0.2	<0.2					
BH109	1.6 - 1.9	30/10/2018	BH109_1.6-1.9	Normal	soil	626161	-	-	-	-	-					
BH110	0.05 - 0.2	1/11/2018	BH110_0.05-0.2	Normal	soil	626161	-	-	-	-	-					
BH111	0.1 - 0.2	1/11/2018	BH111_0.1-0.2	Normal	soil	626161	-	-	-	-	-					
IP130	0.1 - 0.2	31/10/2018	IP130_0.1-0.2	Normal	soil	626161	-	-	-	-	-					
IP133	0.4 - 0.6	31/10/2018	IP133_0.4-0.6	Normal	soil	626161	<2	<0.2	<2	<0.2	<0.2					
IP133	0.4 - 0.6	31/10/2018	QA2	Field_D	soil	626161	-	-	-	-	-					
IP136	0.4 - 0.6	31/10/2018	IP136_0.4-0.6	Normal	soil	626161	-	-	-	-	-					
IP136	0.4 - 0.7	31/10/2018	QA1	Field_D	soil	626161	-	-	-	-	-					
IP137	0.05 - 0.2	31/10/2018	IP137_0.05-0.2	Normal	soil	626161	-	-	-	-	-					
IP138	0.05 - 0.2	31/10/2018	IP138_0.05-0.2	Normal	soil	626161	-	-	-	-	-					
IP140	0.4 - 0.6	31/10/2018	IP140_0.4-0.6	Normal	soil	626161	-	-	-	-	-					
IP143	0.05 - 0.1	31/10/2018	IP143_0.05-0.1	Normal	soil	626161	-	-	-	-	-					
TP120	0.2 - 0.3	3/11/2018	TP120 0.2-0.3M	Normal	soil	626734	-	-	-	-	-					
TP121	0.4 - 0.6	2/11/2018	TP121 0.4-0.6M	Normal	soil	626734	-	-	-	-	-					

Comments

#1 Separate management limits for BTEX & napthalene are not available hence should not be subtracted from the relevant fractions to obtain F1 & F2

#2 Develop site specific based on CEC, pH, clay content, state and traffic volume

#3 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.

#4 Errata 30 April 2014 - Naphthalene should not be subtracted from >C10-C16 (as there is no separate ESL for naphthalene)

#5 Nil

											PCBs							
							Pirimiphos-methyl	Pyrazophos	Ronnel	Terbufos	Trichloronate	Tetrachlorvinphos	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	PCBs (Total)
							mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL							0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																				
NEPM 2013 EIL-Urban Residential- Public Open Space																				
0-2m																				
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil																				
0-2m																				
Location Code	**Depth**	**Date**	**Field ID**	**Sample Type**	**Matrix Type**	**Lab Report Number**														
BH100	0.05 - 0.15	2/11/2018	BH100 0.05-0.15M	Normal	soil	626734	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH100	0.4 - 0.6	2/11/2018	BH100 0.4-0.6M	Normal	soil	626734	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH102	0.4 - 0.5	31/10/2018	BH102_0.4-0.5	Normal	soil	626161	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH102	0.9 - 1	31/10/2018	BH102_0.9-1.0	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH107	0.05 - 0.2	30/10/2018	BH107_0.05-0.2	Normal	soil	626161	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH107	1.7 - 2	30/10/2018	BH107_1.7-2.0	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH108	0.05 - 0.2	1/11/2018	BH108_0.05-0.2	Normal	soil	626161	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH108	0.7 - 1	1/11/2018	BH108_0.7-1.0	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH108	0.7 - 1	1/11/2018	QA3	Field_D	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH109	0.05 - 0.2	30/10/2018	BH109_0.05-0.2	Normal	soil	626161	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH109	1.6 - 1.9	30/10/2018	BH109_1.6-1.9	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH110	0.05 - 0.2	1/11/2018	BH110_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH111	0.1 - 0.2	1/11/2018	BH111_0.1-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP130	0.1 - 0.2	31/10/2018	IP130_0.1-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP133	0.4 - 0.6	31/10/2018	IP133_0.4-0.6	Normal	soil	626161	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
IP133	0.4 - 0.6	31/10/2018	QA2	Field_D	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP136	0.4 - 0.6	31/10/2018	IP136_0.4-0.6	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP136	0.4 - 0.7	31/10/2018	QA1	Field_D	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP137	0.05 - 0.2	31/10/2018	IP137_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP138	0.05 - 0.2	31/10/2018	IP138_0.05-0.2	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP140	0.4 - 0.6	31/10/2018	IP140_0.4-0.6	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP143	0.05 - 0.1	31/10/2018	IP143_0.05-0.1	Normal	soil	626161	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP120	0.2 - 0.3	3/11/2018	TP120 0.2-0.3M	Normal	soil	626734	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP121	0.4 - 0.6	2/11/2018	TP121 0.4-0.6M	Normal	soil	626734	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Comments

#1 Separate management limits for BTEX & napthalene are not available hence should not be subtracted from the relevant fractions to obtain F1 & F2

#2 Develop site specific based on CEC, pH, clay content, state and traffic volume

#3 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.

#4 Errata 30 April 2014 - Naphthalene should not be subtracted from >C10-C16 (as there is no separate ESL for naphthalene)

#5 Nil

JKE AESA report 2019

0 25 50 75 100 125

SCALE 1:2500 @A4 m

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

Title: **SITE LOCATION PLAN**

Location: GRIFFITH REGIONAL HEALTH SERVICE, 1 NOOREBAR AVE GRIFFITH, NSW

Report No: E30991BT

Figure: 1

JKEnvironments

PLOT DATE: 25/11/2019 12:42:04 PM DWG FILE: S:\S EIS\SC EIS JOBS\30000'S\E30991KH GRIFFITH\CAD\CAD30991\E30998BT.DWG

LEGEND

APPROXIMATE SITE BOUNDARY

WIDER HOSPITAL PROPERTY BOUNDARY

BH201(m) BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (M) BH201 TO BH217 WERE DRILLED AS PART OF THE CURRENT JKE INVESTIGATION.

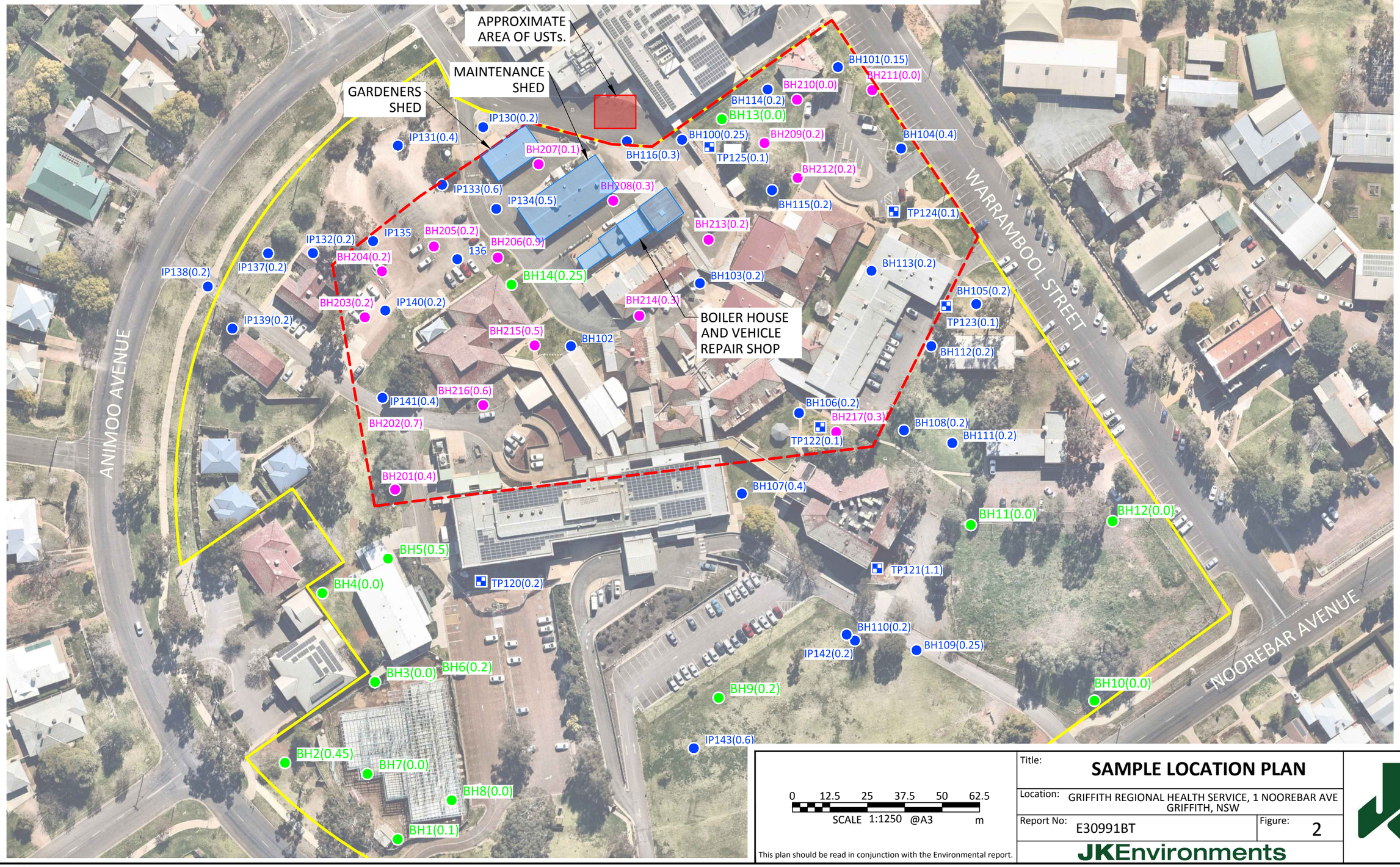
BH101(m) BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (M) BH100 TO BH116 DRILLED AS PART OF THE 2018 GHD INVESTIGATIONS.

BH116(m) GROUNDWATER MONITORING WELL LOCATIONS, NUMBER AND DEPTH OF FILL (M) BH116 TO DRILLED AS PART OF THE 2018 GHD INVESTIGATIONS.

IP130(m) BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (M) IP130 TO IP142 DRILLED AS PART OF THE 2018 GHD INVESTIGATIONS.

TP120(m) TEST PITS LOCATION, NUMBER AND DEPTH OF FILL (M) TP120 TO TP121 EXCAVATED AS PART OF THE 2018 GHD INVESTIGATIONS.

BH1(m) BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (M) BH1 TO BH14 DRILLED AS PART OF THE NOVEMBER 2017 EIS INVESTIGATION.



0 12.5 25 37.5 50 62.5

SCALE 1:1250 @A3 m

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

Title: **SAMPLE LOCATION PLAN**

Location: GRIFFITH REGIONAL HEALTH SERVICE, 1 NOOREBAR AVE GRIFFITH, NSW

Report No: E30991BT

Figure: 2

JKEnvironments

PLOT DATE: 25/11/2019 12:02:54 PM DWG FILE: S:\S EIS\SC EIS JOBS\3000'S\E30991KH GRIFFITH\CAD\CAD\30991L2\E30998T.DWG

LEGEND

APPROXIMATE SITE BOUNDARY

WIDER HOSPITAL PROPERTY BOUNDARY

BH201(m) BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (M) BH201 TO BH217 WERE DRILLED AS PART OF THE CURRENT JKE INVESTIGATION.

BH101(m) BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (M) BH100 TO BH116 DRILLED AS PART OF THE 2018 GHD INVESTIGATIONS.

BH116(m) GROUNDWATER MONITORING WELL LOCATIONS, NUMBER AND DEPTH OF FILL (M) BH116 TO DRILLED AS PART OF THE 2018 GHD INVESTIGATIONS.

IP130(m) BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (M) IP130 TO IP142 DRILLED AS PART OF THE 2018 GHD INVESTIGATIONS.

TP120(m) TEST PITS LOCATION, NUMBER AND DEPTH OF FILL (M) TP120 TO TP121 EXCAVATED AS PART OF THE 2018 GHD INVESTIGATIONS.

BH1(m) BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (M) BH1 TO BH14 DRILLED AS PART OF THE NOVEMBER 2017 EIS INVESTIGATION.

Location	Depth (metres)
Analyte	Concentration (units)

SOIL/SURFACE CONTAMINATION ABOVE SAC FOR HUMAN HEALTH RISK

SOIL CONTAMINATION ABOVE SAC FOR ECOLOGICAL RISK

GROUNDWATER CONTAMINATION ABOVE SAC

BH116	
Cadmium	0.0005mg/L
Copper	0.017mg/L
Nickel	0.019mg/L
Zinc	0.027mg/L

TP124	0.0-0.1
Asbestos	0.0436%

BH107	0.05-0.2m
Nickel	390mg/kg

APPROXIMATE AREA OF USTs.

MAINTENANCE SHED

GARDENERS SHED

BOILER HOUSE AND VEHICLE REPAIR SHOP

ANIMOO AVENUE

WARRAMBOOL STREET

NOOREBAR AVENUE

BH101(0.15) BH211(0.0) BH210(0.0) BH114(0.2) BH13(0.0) BH100(0.25) BH209(0.2) BH104(0.4) BH116(0.3) TP125(0.1) BH212(0.2) BH115(0.2) TP124(0.1) BH213(0.2) BH113(0.2) BH105(0.2) TP123(0.1) BH112(0.2) BH103(0.2) BH214(0.3) BH106(0.2) BH217(0.3) BH108(0.2) TP122(0.1) BH111(0.2) BH107(0.4) BH11(0.0) BH12(0.0) TP121(1.1) BH110(0.2) BH109(0.25) IP142(0.2) BH10(0.0) BH9(0.2) IP143(0.6) IP130(0.2) IP131(0.4) BH207(0.1) IP133(0.6) IP134(0.5) BH208(0.3) BH205(0.2) BH206(0.9) 136 IP135 IP132(0.2) BH204(0.2) IP137(0.2) IP138(0.2) BH14(0.25) BH203(0.2) IP140(0.2) IP139(0.2) BH215(0.5) BH102 IP141(0.4) BH216(0.6) BH202(0.7) BH201(0.4) BH5(0.5) BH4(0.0) TP120(0.2) BH3(0.0) BH6(0.2) BH2(0.45) BH7(0.0) BH8(0.0) BH1(0.1)

0 12.5 25 37.5 50 62.5

SCALE 1:1250 @A3 m

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

Title: **CONTAMINATION LOCATION PLAN**

Location: GRIFFITH REGIONAL HEALTH SERVICE, 1 NOOREBAR AVE GRIFFITH, NSW

Report No: E30991BT

Figure: 3

JKEnvironments

PLOT DATE: 25/11/2019 12:03:39 PM DWG FILE: S:\S EIS\SC EIS JOBS\3000'S\E30991KH GRIFFITH\CAD\CAD\30991L2\E30998T.DWG

ABBREVIATIONS AND EXPLANATIONS

Abbreviations used in the Tables:

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

Table Specific Explanations:

HIL Tables:

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

EIL/ESL Table:

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

Waste Classification and TCLP Table:

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

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

All data in mg/kg unless stated otherwise			HEAVY METALS								PAHs		ORGANOCHLORINE PESTICIDES (OCPs)							OP PESTICIDES (OPPs)	TOTAL PCBs	ASBESTOS FIBRES
			Arsenic	Cadmium	Chromium VI	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	-	0.05	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	100
Site Assessment Criteria (SAC)			100	20	100	6000	300	40	400	7400	300	3	10	270	300	6	50	240	6	160	1	Detected/Not Detected
Sample Reference	**Sample Depth**	**Sample Description**																				
BH201	0.1-0.2	Fill: silty clay	<4	<0.4	17	6	6	<0.1	7	21	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH201	0.1-0.2	Laboratory duplicate	<4	<0.4	17	6	7	<0.1	6	23	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH202	0.1-0.2	Silty clay	<4	<0.4	20	6	9	<0.1	7	12	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH203	0.1-0.2	Fill: silty clay	<4	<0.4	15	10	11	<0.1	10	18	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH204	0.1-0.2	Fill: silty clay	5	<0.4	25	33	21	<0.1	8	42	0.68	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH205	0.1-0.2	Fill: silty gravel	<4	<0.4	16	4	5	<0.1	6	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
BH206	0.1-0.2	Fill: silty clay	<4	<0.4	25	8	8	<0.1	11	16	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH207	0.05-0.1	Fill: silty gravel	<4	<0.4	41	27	14	<0.1	70	48	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH208	0.1-0.2	Fill: silty gravel	<4	<0.4	68	38	6	<0.1	170	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
BH209	0.1-0.2	Fill: clayey silt	<4	<0.4	44	11	9	<0.1	32	25	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH210	0.05-0.1	Clayey silt	<4	<0.4	17	3	5	<0.1	4	71	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH211	0.1-0.2	Clayey silt	<4	<0.4	17	3	4	<0.1	3	7	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH211	0.1-0.2	Laboratory duplicate	<4	<0.4	17	3	4	<0.1	3	6	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH212	0.1-0.2	Fill: silty clay	<4	<0.4	20	7	8	<0.1	11	20	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH213	0.1-0.2	Fill: silty gravel	<4	<0.4	43	17	60	<0.1	44	79	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH214	0.1-0.2	Fill: silty clay	<4	<0.4	30	18	14	<0.1	43	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
BH215	0.1-0.2	Fill: silty clay	<4	<0.4	17	7	5	<0.1	19	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
BH216	0.1-0.3	Fill: silty clay	<4	<0.4	62	28	44	<0.1	110	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
BH217	0.1-0.3	Fill: silty clay	<4	<0.4	16	7	7	<0.1	8	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
Total Number of Samples			19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	17
Maximum Value			5	<PQL	68	38	60	<PQL	170	79	0.68	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	NC

Concentration above the SAC **VALUE**

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

					C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	Field PID Measurement
PQL - Envirolab Services					25	50	0.2	0.5	1	1	1	ppm
NEPM 2013 HSL Land Use Category					**HSL-A/B:LOW/HIGH DENSITY RESIDENTIAL**							
Sample Reference	**Sample Depth**	**Sample Description**	**Depth Category**	**Soil Category**								
BH201	0.1-0.2	Fill: silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH201	0.1-0.2	Laboratory duplicate	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH202	0.1-0.2	Silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH203	0.1-0.2	Fill: silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH204	0.1-0.2	Fill: silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH205	0.1-0.2	Fill: silty gravel	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH206	0.1-0.2	Fill: silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH207	0.05-0.1	Fill: silty gravel	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH208	0.1-0.2	Fill: silty gravel	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH209	0.1-0.2	Fill: clayey silt	0m to <1m	Sand	<25	89	<0.2	<0.5	<1	<3	<1	0
BH210	0.05-0.1	Clayey silt	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH211	0.1-0.2	Clayey silt	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH211	0.1-0.2	Laboratory duplicate	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH212	0.1-0.2	Fill: silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH213	0.1-0.2	Fill: silty gravel	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH214	0.1-0.2	Fill: silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH215	0.1-0.2	Fill: silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH216	0.1-0.3	Fill: silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
BH217	0.1-0.3	Fill: silty clay	0m to <1m	Sand	<25	<50	<0.2	<0.5	<1	<3	<1	0
Total Number of Samples					19	19	19	19	19	19	19	19
Maximum Value					<PQL	89	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL

Concentration above the SAC **VALUE**

The guideline corresponding to the elevated value is highlighted in grey in the Site Assessment Criteria Table below

SITE ASSESSMENT CRITERIA

					C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene
PQL - Envirolab Services					25	50	0.2	0.5	1	1	1
NEPM 2013 HSL Land Use Category					**HSL-A/B:LOW/HIGH DENSITY RESIDENTIAL**						
Sample Reference	**Sample Depth**	**Sample Description**	**Depth Category**	**Soil Category**							
BH201	0.1-0.2	Fill: silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH201	0.1-0.2	Laboratory duplicate	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH202	0.1-0.2	Silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH203	0.1-0.2	Fill: silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH204	0.1-0.2	Fill: silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH205	0.1-0.2	Fill: silty gravel	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH206	0.1-0.2	Fill: silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH207	0.05-0.1	Fill: silty gravel	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH208	0.1-0.2	Fill: silty gravel	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH209	0.1-0.2	Fill: clayey silt	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH210	0.05-0.1	Clayey silt	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH211	0.1-0.2	Clayey silt	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH211	0.1-0.2	Laboratory duplicate	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH212	0.1-0.2	Fill: silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH213	0.1-0.2	Fill: silty gravel	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH214	0.1-0.2	Fill: silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH215	0.1-0.2	Fill: silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH216	0.1-0.3	Fill: silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3
BH217	0.1-0.3	Fill: silty clay	0m to <1m	Sand	45	110	0.5	160	55	40	3

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

Land Use Category				URBAN RESIDENTIAL AND PUBLIC OPEN SPACE																	
							AGED HEAVY METALS-EILs						EILs		ESLs						
				pH	CEC ($cmol_c/kg$)	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	0.1	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**																				
BH201	0.1-0.2	Fill: silty clay	Fine	NA	NA	NA	<4	17	6	6	7	21	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH201	0.1-0.2	Laboratory duplicate	Coarse	NA	NA	NA	<4	17	6	7	6	23	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH202	0.1-0.2	Silty clay	Fine	NA	NA	NA	<4	20	6	9	7	12	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH203	0.1-0.2	Fill: silty clay	Fine	NA	NA	NA	<4	15	10	11	10	18	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH204	0.1-0.2	Fill: silty clay	Fine	NA	NA	NA	5	25	33	21	8	42	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	0.08
BH205	0.1-0.2	Fill: silty gravel	Coarse	NA	NA	NA	<4	16	4	5	6	8	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH206	0.1-0.2	Fill: silty clay	Fine	NA	NA	NA	<4	25	8	8	11	16	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH207	0.05-0.1	Fill: silty gravel	Coarse	NA	18	NA	<4	41	27	14	70	48	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH208	0.1-0.2	Fill: silty gravel	Coarse	NA	37	NA	<4	68	38	6	170	43	<1	<0.1	<25	<50	<100	120	<0.2	<0.5	<1	<3	<0.05
BH209	0.1-0.2	Fill: clayey silt	Fine	NA	NA	NA	<4	44	11	9	32	25	<1	<0.1	<25	89	170	<100	<0.2	<0.5	<1	<3	<0.05
BH210	0.05-0.1	Clayey silt	Fine	NA	NA	NA	<4	17	3	5	4	71	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH211	0.1-0.2	Clayey silt	Fine	NA	NA	NA	<4	17	3	4	3	7	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH211	0.1-0.2	Laboratory duplicate	Coarse	NA	NA	NA	<4	17	3	4	3	6	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH212	0.1-0.2	Fill: silty clay	Fine	NA	NA	NA	<4	20	7	8	11	20	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH213	0.1-0.2	Fill: silty gravel	Coarse	NA	10	NA	<4	43	17	60	44	79	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH214	0.1-0.2	Fill: silty clay	Fine	NA	33	NA	<4	30	18	14	43	31	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH215	0.1-0.2	Fill: silty clay	Fine	NA	NA	NA	<4	17	7	5	19	12	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH216	0.1-0.3	Fill: silty clay	Fine	NA	21	NA	<4	62	28	44	110	43	<1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
BH217	0.1-0.3	Fill: silty clay	Fine	NA	NA	NA	<4	16	7	7	8	30	<1	<0.1	<25	<50	100	<100	<0.2	<0.5	<1	<3	<0.05
Total Number of Samples							19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
Maximum Value							5	68	38	60	170	79	<PQL	<PQL	<PQL	89	170	120	<PQL	<PQL	<PQL	<PQL	0.08

Concentration above the SAC

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

				pH	CEC ($cmol_c/kg$)	Clay Content (% clay)	AGED HEAVY METALS-EILs						EILs		ESLs								
							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	0.1	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**																				
BH201	0.1-0.2	Fill: silty clay	Fine	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	1300	5600	65	105	125	45	20
BH201	0.1-0.2	Laboratory duplicate	Coarse	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	300	2800	50	85	70	105	20
BH202	0.1-0.2	Silty clay	Fine	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	1300	5600	65	105	125	45	20
BH203	0.1-0.2	Fill: silty clay	Fine	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	1300	5600	65	105	125	45	20
BH204	0.1-0.2	Fill: silty clay	Fine	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	1300	5600	65	105	125	45	20
BH205	0.1-0.2	Fill: silty gravel	Coarse	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	300	2800	50	85	70	105	20
BH206	0.1-0.2	Fill: silty clay	Fine	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	1300	5600	65	105	125	45	20
BH207	0.05-0.1	Fill: silty gravel	Coarse	NA	18	NA	100	203	88	1263	275	192	170	180	180	120	300	2800	50	85	70	105	20
BH208	0.1-0.2	Fill: silty gravel	Coarse	NA	37	NA	100	203	88	1263	425	192	170	180	180	120	300	2800	50	85	70	105	20
BH209	0.1-0.2	Fill: clayey silt	Fine	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	1300	5600	65	105	125	45	20
BH210	0.05-0.1	Clayey silt	Fine	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	1300	5600	65	105	125	45	20
BH211	0.1-0.2	Clayey silt	Fine	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	1300	5600	65	105	125	45	20
BH211	0.1-0.2	Laboratory duplicate	Coarse	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	300	2800	50	85	70	105	20
BH212	0.1-0.2	Fill: silty clay	Fine	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	1300	5600	65	105	125	45	20
BH213	0.1-0.2	Fill: silty gravel	Coarse	NA	10	NA	100	203	88	1263	175	192	170	180	180	120	300	2800	50	85	70	105	20
BH214	0.1-0.2	Fill: silty clay	Fine	NA	33	NA	100	203	88	1263	425	192	170	180	180	120	1300	5600	65	105	125	45	20
BH215	0.1-0.2	Fill: silty clay	Fine	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	1300	5600	65	105	125	45	20
BH216	0.1-0.3	Fill: silty clay	Fine	NA	21	NA	100	203	88	1263	355	192	170	180	180	120	1300	5600	65	105	125	45	20
BH217	0.1-0.3	Fill: silty clay	Fine	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	1300	5600	65	105	125	45	20

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TABLE D
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**																									
BH201	0.1-0.2	Fill: silty clay	<4	<0.4	17	6	6	<0.1	7	21	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	Not Detected
BH201	0.1-0.2	Laboratory duplicate	<4	<0.4	17	6	7	<0.1	6	23	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	NA
BH202	0.1-0.2	Silty clay	<4	<0.4	20	6	9	<0.1	7	12	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	Not Detected
BH203	0.1-0.2	Fill: silty clay	<4	<0.4	15	10	11	<0.1	10	18	<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
BH204	0.1-0.2	Fill: silty clay	5	<0.4	25	33	21	<0.1	8	42	0.68	0.08	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	Not Detected
BH205	0.1-0.2	Fill: silty gravel	<4	<0.4	16	4	5	<0.1	6	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
BH206	0.1-0.2	Fill: silty clay	<4	<0.4	25	8	8	<0.1	11	16	<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
BH207	0.05-0.1	Fill: silty gravel	<4	<0.4	41	27	14	<0.1	**70**	48	<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
BH208	0.1-0.2	Fill: silty gravel	<4	<0.4	68	38	6	<0.1	**170**	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
BH209	0.1-0.2	Fill: clayey silt	<4	<0.4	44	11	9	<0.1	32	25	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	62	150	<100	212	<0.2	<0.5	<1	<3	Not Detected
BH210	0.05-0.1	Clayey silt	<4	<0.4	17	3	5	<0.1	4	71	<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
BH211	0.1-0.2	Clayey silt	<4	<0.4	17	3	4	<0.1	3	7	<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
BH211	0.1-0.2	Laboratory duplicate	<4	<0.4	17	3	4	<0.1	3	6	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<3	NA
BH212	0.1-0.2	Fill: silty clay	<4	<0.4	20	7	8	<0.1	11	20	<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
BH213	0.1-0.2	Fill: silty gravel	<4	<0.4	43	17	60	<0.1	**44**	79	<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
BH214	0.1-0.2	Fill: silty clay	<4	<0.4	30	18	14	<0.1	**43**	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
BH215	0.1-0.2	Fill: silty clay	<4	<0.4	17	7	5	<0.1	19	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
BH216	0.1-0.3	Fill: silty clay	<4	<0.4	62	28	44	<0.1	**110**	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
BH217	0.1-0.3	Fill: silty clay	<4	<0.4	16	7	7	<0.1	8	30	<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
Total Number of samples			19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	17
Maximum Value			5	<PQL	68	38	60	<PQL	170	79	0.68	0.08	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	62	150	<PQL	212	<PQL	<PQL	<PQL	<PQL	NC

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

TABLE E
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**	
BH207	0.05-0.1	Fill: silty gravel	<0.02
BH208	0.1-0.2	Fill: silty gravel	0.02
BH213	0.1-0.2	Fill: silty gravel	<0.02
BH214	0.1-0.2	Fill: silty clay	<0.02
BH216	0.1-0.3	Fill: silty clay	<0.02
Total Number of samples			5
Maximum Value			0.02

General Solid Waste	**VALUE**
Restricted Solid Waste	**VALUE**
Hazardous Waste	**VALUE**

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

			C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	>C_{16}-C_{34} (F3)	>C_{34}-C_{40} (F4)
PQL - Envirolab Services			25	50	100	100
NEPM 2013 Land Use Category			**RESIDENTIAL, PARKLAND & PUBLIC OPEN SPACE**			
Sample Reference	**Sample Depth**	**Soil Texture**				
BH201	0.1-0.2	Coarse	<25	<50	<100	<100
BH201	0.1-0.2	Coarse	<25	<50	<100	<100
BH202	0.1-0.2	Coarse	<25	<50	<100	<100
BH203	0.1-0.2	Coarse	<25	<50	<100	<100
BH204	0.1-0.2	Coarse	<25	<50	<100	<100
BH205	0.1-0.2	Coarse	<25	<50	<100	<100
BH206	0.1-0.2	Coarse	<25	<50	<100	<100
BH207	0.05-0.1	Coarse	<25	<50	<100	<100
BH208	0.1-0.2	Coarse	<25	<50	<100	120
BH209	0.1-0.2	Coarse	<25	89	170	<100
BH210	0.05-0.1	Coarse	<25	<50	<100	<100
BH211	0.1-0.2	Coarse	<25	<50	<100	<100
BH211	0.1-0.2	Coarse	<25	<50	<100	<100
BH212	0.1-0.2	Coarse	<25	<50	<100	<100
BH213	0.1-0.2	Coarse	<25	<50	<100	<100
BH214	0.1-0.2	Coarse	<25	<50	<100	<100
BH215	0.1-0.2	Coarse	<25	<50	<100	<100
BH216	0.1-0.3	Coarse	<25	<50	<100	<100
BH217	0.1-0.3	Coarse	<25	<50	100	<100
Total Number of Samples			19	19	19	19
Maximum Value			<PQL	89	170	120

Concentration above the SAC **VALUE**

MANAGEMENT LIMIT ASSESSMENT CRITERIA

			C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	>C_{16}-C_{34} (F3)	>C_{34}-C_{40} (F4)
PQL - Envirolab Services			25	50	100	100
NEPM 2013 Land Use Category			**RESIDENTIAL, PARKLAND & PUBLIC OPEN SPACE**			
Sample Reference	**Sample Depth**	**Soil Texture**				
BH201	0.1-0.2	Coarse	700	1000	2500	10000
BH201	0.1-0.2	Coarse	700	1000	2500	10000
BH202	0.1-0.2	Coarse	700	1000	2500	10000
BH203	0.1-0.2	Coarse	700	1000	2500	10000
BH204	0.1-0.2	Coarse	700	1000	2500	10000
BH205	0.1-0.2	Coarse	700	1000	2500	10000
BH206	0.1-0.2	Coarse	700	1000	2500	10000
BH207	0.05-0.1	Coarse	700	1000	2500	10000
BH208	0.1-0.2	Coarse	700	1000	2500	10000
BH209	0.1-0.2	Coarse	700	1000	2500	10000
BH210	0.05-0.1	Coarse	700	1000	2500	10000
BH211	0.1-0.2	Coarse	700	1000	2500	10000
BH211	0.1-0.2	Coarse	700	1000	2500	10000
BH212	0.1-0.2	Coarse	700	1000	2500	10000
BH213	0.1-0.2	Coarse	700	1000	2500	10000
BH214	0.1-0.2	Coarse	700	1000	2500	10000
BH215	0.1-0.2	Coarse	700	1000	2500	10000
BH216	0.1-0.3	Coarse	700	1000	2500	10000
BH217	0.1-0.3	Coarse	700	1000	2500	10000

TABLE G
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		82,000	62,000	85,000	120,000	1,100	120,000	85,000	130,000	29,000	
Site Use		**Intrusive Maintenance Worker - DIRECT SOIL CONTACT**									
Sample Reference	**Sample Depth**										
BH201	0.1-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
BH201	0.1-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
BH202	0.1-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
BH203	0.1-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
BH204	0.1-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
BH205	0.1-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
BH206	0.1-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
BH207	0.05-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
BH208	0.1-0.2	<25	<50	<100	120	<0.2	<0.5	<1	<3	<1	0
BH209	0.1-0.2	<25	89	170	<100	<0.2	<0.5	<1	<3	<1	0
BH210	0.05-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
BH211	0.1-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
BH211	0.1-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
BH212	0.1-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
BH213	0.1-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
BH214	0.1-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
BH215	0.1-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
BH216	0.1-0.3	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<1	0
BH217	0.1-0.3	<25	<50	100	<100	<0.2	<0.5	<1	<3	<1	0
Total Number of Samples		19	19	19	19	19	19	19	19	19	19
Maximum Value		<PQL	89	170	120	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL

Concentration above the SAC **VALUE**

TABLE H
SOIL INTRA-LABORATORY DUPLICATE RESULTS & RPD CALCULATIONS
All results in mg/kg unless stated otherwise

SAMPLE	ANALYSIS	Envirolab PQL	INITIAL	REPEAT	MEAN	RPD %
Sample Ref = BH206 (0.1-0.2)	Arsenic	4	<4	<4	NC	NC
Dup Ref = DUP1	Cadmium	0.4	<0.4	<0.4	NC	NC
	Chromium	1	25	17	21.0	38
Envirolab Report: 228853	Copper	1	8	6	7.0	29
	Lead	1	8	6	7.0	29
	Mercury	0.1	<0.1	<0.1	NC	NC
	Nickel	1	11	10	10.5	10
	Zinc	1	16	9	12.5	56
	Naphthalene	0.1	<0.1	<0.1	NC	NC
	Acenaphthylene	0.1	<0.1	<0.1	NC	NC
	Acenaphthene	0.1	<0.1	<0.1	NC	NC
	Fluorene	0.1	<0.1	<0.1	NC	NC
	Phenanthrene	0.1	<0.1	<0.1	NC	NC
	Anthracene	0.1	<0.1	<0.1	NC	NC
	Fluoranthene	0.1	<0.1	<0.1	NC	NC
	Pyrene	0.1	<0.1	<0.1	NC	NC
	Benzo(a)anthracene	0.1	<0.1	<0.1	NC	NC
	Chrysene	0.1	<0.1	<0.1	NC	NC
	Benzo(b,j+k)fluoranthene	0.2	<0.2	<0.2	NC	NC
	Benzo(a)pyrene	0.05	<0.05	<0.05	NC	NC
	Indeno(123-cd)pyrene	0.1	<0.1	<0.1	NC	NC
	Dibenzo(ah)anthracene	0.1	<0.1	<0.1	NC	NC
	Benzo(ghi)perylene	0.1	<0.1	<0.1	NC	NC
	TRH C6-C10 (F1)	25	<25	<25	NC	NC
	TRH >C10-C16 (F2)	50	<50	<50	NC	NC
	TRH >C16-C34 (F3)	100	<100	<100	NC	NC
	TRH >C34-C40 (F4)	100	<100	<100	NC	NC
	Benzene	0.2	<0.2	<0.2	NC	NC
	Toluene	0.5	<0.5	<0.5	NC	NC
	Ethylbenzene	1	<1	<1	NC	NC
	m+p-xylene	2	<2	<2	NC	NC
	o-xylene	1	<1	<1	NC	NC

RPD Results Above the Acceptance Criteria VALUE

TABLE I

SOIL INTER-LABORATORY DUPLICATE RESULTS & RPD CALCULATIONS

All results in mg/kg unless stated otherwise

SAMPLE	ANALYSIS	Envirolab PQL	Envirolab VIC PQL	INITIAL	REPEAT	MEAN	RPD %
Sample Ref = BH213 (0.1-0.2)	Arsenic	4	4	<4	<4	NC	NC
Dup Ref = DUP2	Cadmium	0.4	0.4	<0.4	<0.4	NC	NC
	Chromium	1	1	43	27	35.0	46
Envirolab Report: 228853	Copper	1	1	17	42	29.5	85
Envirolab VIC Report: 18650	Lead	1	1	60	82	71.0	31
	Mercury	0.1	0.1	<0.1	<0.1	NC	NC
	Nickel	1	1	44	21	32.5	71
	Zinc	1	1	79	220	149.5	94
	Naphthalene	0.1	0.1	<0.1	<0.1	NC	NC
	Acenaphthylene	0.1	0.1	<0.1	<0.1	NC	NC
	Acenaphthene	0.1	0.1	<0.1	<0.1	NC	NC
	Fluorene	0.1	0.1	<0.1	<0.1	NC	NC
	Phenanthrene	0.1	0.1	<0.1	<0.1	NC	NC
	Anthracene	0.1	0.1	<0.1	<0.1	NC	NC
	Fluoranthene	0.1	0.1	<0.1	<0.1	NC	NC
	Pyrene	0.1	0.1	<0.1	<0.1	NC	NC
	Benzo(a)anthracene	0.1	0.1	<0.1	<0.1	NC	NC
	Chrysene	0.1	0.1	<0.1	<0.1	NC	NC
	Benzo(b,j+k)fluoranthene	0.2	0.2	<0.2	<0.2	NC	NC
	Benzo(a)pyrene	0.05	0.05	<0.05	<0.05	NC	NC
	Indeno(123-cd)pyrene	0.1	0.1	<0.1	<0.1	NC	NC
	Dibenzo(ah)anthracene	0.1	0.1	<0.1	<0.1	NC	NC
	Benzo(ghi)perylene	0.1	0.1	<0.1	<0.1	NC	NC
	TRH C6-C10 (F1)	25	25	<25	<25	NC	NC
	TRH >C10-C16 (F2)	50	50	<50	<50	NC	NC
	TRH >C16-C34 (F3)	100	100	<100	<100	NC	NC
	TRH >C34-C40 (F4)	100	100	<100	<100	NC	NC
	Benzene	0.2	0.2	<0.2	<0.2	NC	NC
	Toluene	0.5	0.5	<0.5	<0.5	NC	NC
	Ethylbenzene	1	1	<1	<1	NC	NC
	m+p-xylene	2	2	<2	<2	NC	NC
	o-xylene	1	1	<1	<1	NC	NC

RPD Results Above the Acceptance Criteria VALUE

TABLE J
SUMMARY OF FIELD QA/QC RESULTS

ANALYSIS	Envirolab PQL		TB1[S]
			17-Oct-19
	mg/kg	µg/L	mg/kg
TRH C6-C10 (F1)	10	10	NA
Benzene	0.2	0.2	<0.2
Toluene	0.5	0.5	<0.5
Ethylbenzene	1	1	<1
m+p-xylene	2	2	<2
o-xylene	1	1	<1

Explanation:

[S] Sample type (sand)

Values above PQLs/Acceptance criteria **VALUE**